BEYOND BITCOIN

HOW FINANCIAL INSTITUTIONS ARE APPLYING DISTRIBUTED LEDGER TECHNOLOGIES TO NEW USE CASES FOR GROUND-UP BUSINESS TRANSFORMATION

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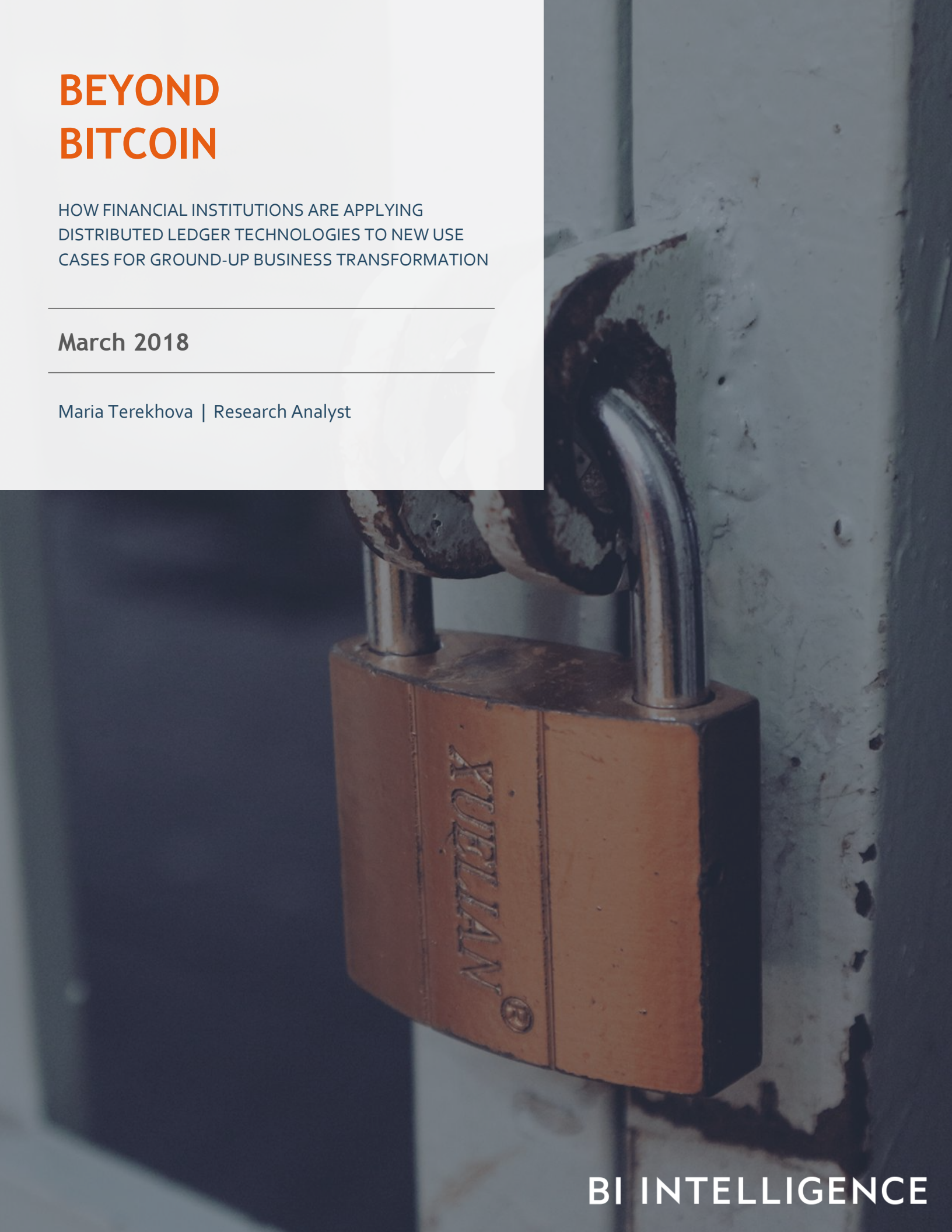

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KEY POINTS

- **Distributed ledger technologies (DLTs) are proving attractive to financial institutions (FIs) because of their ability to act as a single source of truth.** DLTs can distribute information securely between a network of participants, thereby cutting out middlemen, improving transaction times, and greatly reducing redundancy and costs.

- **DLTs like blockchain and smart contracts stand to save the financial services (FS) industry up to $50 billion a year.** This can be achieved through improved operational efficiencies, reduced human error, and better regulatory compliance.

- **The technology is being explored actively in all segments of FS, but some sectors are seeing particularly high activity.** Segments like trade finance, insurance, and capital markets, where transactions depend on efficient communication and collaboration between disparate parties, stand to benefit greatly from migrating operations onto distributed ledgers.

- **Despite the industry's level of interest and many DLT pilots, actual implementation of DLT-based solutions is still low.** This is due to a lack of tech talent at legacy institutions, vague understanding of the tech and how it works, a lack of knowledge at the executive level to bring projects to fruition, and pitfalls embedded in the tech itself, including regulatory and degree of control concerns.

- **But some players are actively trying to make DLTs more usable for the FS industry and spur adoption.** They're doing so by making editable versions of DLTs, embedding regtech features in DLT platforms, and boosting data privacy on distributed ledgers.

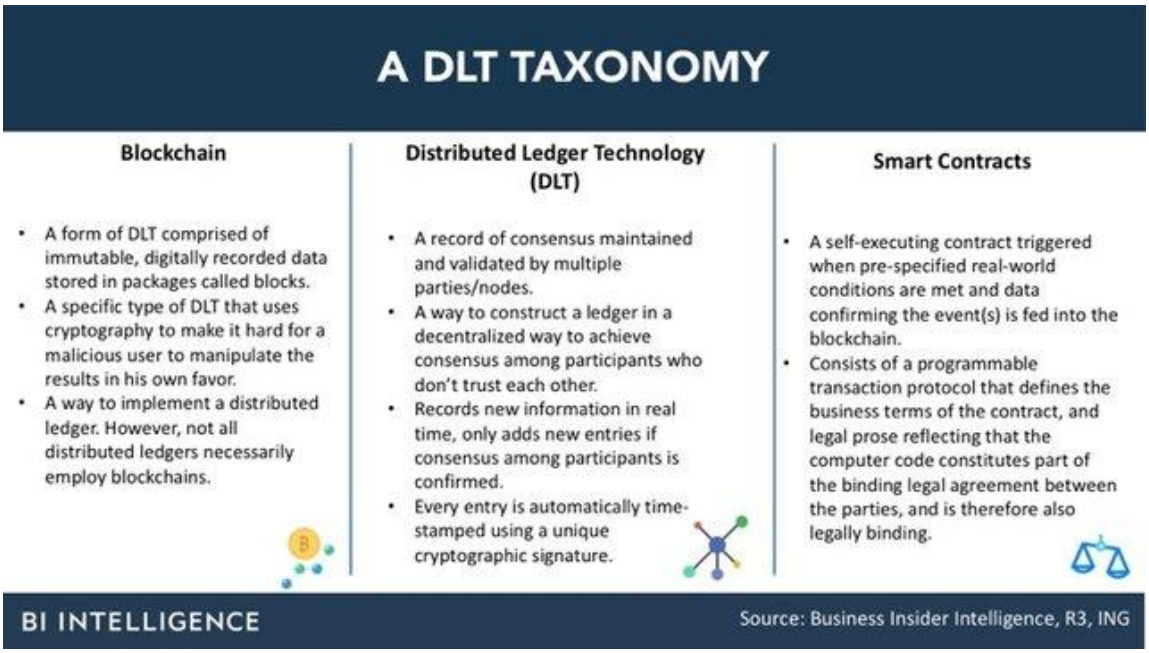
- **A few FIs have pulled ahead of the curve and are very close to taking their DLT projects live, if they haven't already.** These players include major US clearing house DTCC and French insurance giant AXA. They can serve as useful case studies for other institutions in getting their DLT solutions live.

Download the charts and associated data in Excel »

INTRODUCTION

Of the many emerging technologies uprooting and reshaping the world economy, distributed ledger technologies (DLTs) are among the most hyped. DLTs can be used to create shared and immutable digital databases, and dramatically streamline manual and paper-based processes. These technologies are most often associated with cryptocurrency — the most well-known DLT, blockchain, was thrown into the spotlight circa 2009 as the technology underpinning Bitcoin. However, the coverage around cryptocurrencies tends to leave the broader use cases and benefits of DLTs on the sidelines, even though they stand to make a far greater impact on the broader the financial services (FS) industry.

DLT's value lies in its ability to centralize record-keeping while cutting out the need for authorization by an overseeing party, instead allowing a record to be confirmed by multiple parties with access to the database. This means DLTs have the potential to streamline financial institutions' (FI) operations, boost data security, improve customer relationships, and drastically cut costs. Many FIs have therefore expressed interest in leveraging these technologies. For the purposes of this report, the umbrella category of distributed technologies, including blockchain and smart contracts, is referred to as DLTs. While blockchain and smart contracts aren't the only subcategories of DLT, this report primarily focuses on these subsegments because they're being leveraged by FIs the most.



Despite the potential benefits, many FIs face obstacles in leveraging and implementing DLTs, and have struggled to reap the rewards. These obstacles include organizational hurdles, like a lack of tech talent, as well as issues rooted in the technology itself, such as concerns about data security, degree of control over shared records, and enforceability of DLT-based contracts under current legal frameworks. There are a few players working to make the technology more usable for the industry, and some FIs are making breakthroughs in implementing DLTs.

This report will look closely at what DLTs are and why they hold so much promise for FS, the sectors in which DLTs are gaining the most traction and why, and the efforts underway to remove the obstacles preventing wider DLT adoption in FS. It will also examine the few FIs close to bringing their DLT projects to fruition, and how DLTs might transform the nature of FS if adoption truly takes off.

DLT PLATFORM COMPARISON

	Ethereum	Hyperledger Fabric	R3 Corda
Description of platform	Generic blockchain platform	Modular blockchain platform	Specialized distributed ledger platform for financial industry
Governance	Ethereum developers	Linux Foundation	R3
Mode of operation	Permissionless, public or private	Permissioned, private	Permissioned, private
Consensus	Mining based proof-of-work Ledger level	Broad understanding of consensus that allows multiple approaches Transaction level	Specific understanding or consensus (i.e. notary nodes) Transaction level
Smart contracts	Smart contract code (e.g. Solidity)	Smart contract code (e.g. Go, Java)	Smart contract code (e.g. Kotlin, Java) Smart legal contract (legal prose)
Currency	Ether Tokens via smart contract	None Currency and tokens via chaincode	None

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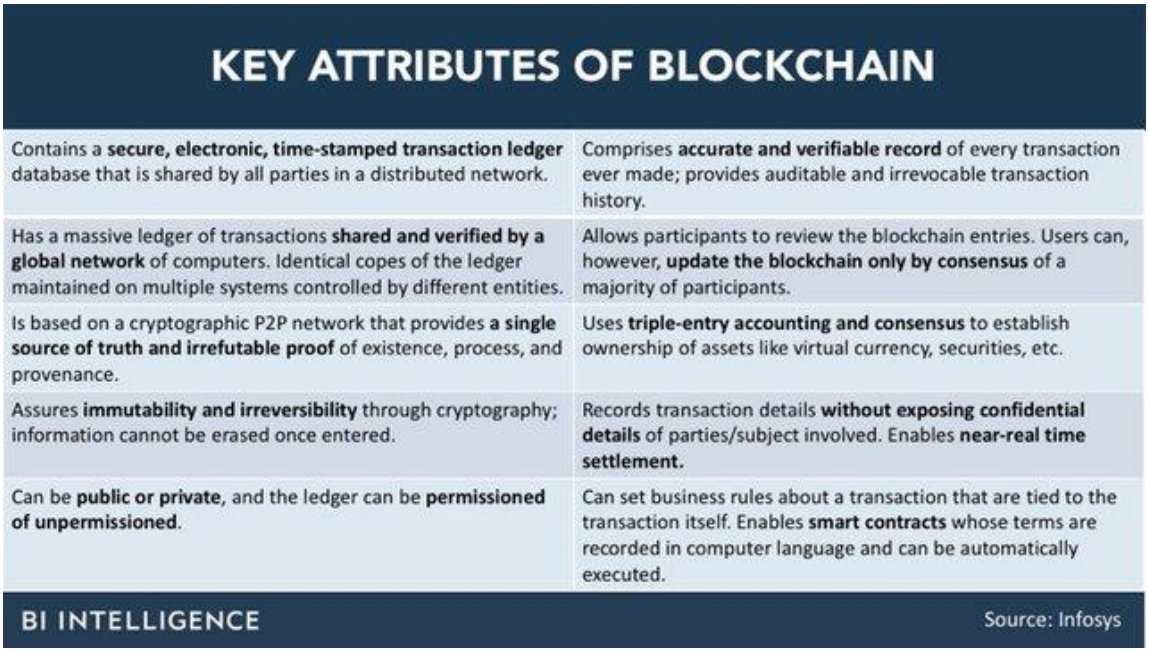
Source: Credit Suisse, Frankfurt School Blockchain Center

WHY FINANCIAL INSTITUTIONS ARE LOOKING INTO DLTS

FIs are interested in DLTs because of their decentralized structure, which can reduce or eliminate multiple inefficiencies and pitfalls that previously seemed unsolvable. However, DLTs can bring a few other key advantages to the financial industry as a whole.



KEY ATTRIBUTES OF BLOCKCHAIN	
Contains a **secure, electronic, time-stamped transaction ledger** database that is shared by all parties in a distributed network.	Comprises **accurate and verifiable record** of every transaction ever made; provides auditable and irrevocable transaction history.
Has a massive ledger of transactions **shared and verified by a global network** of computers. Identical copes of the ledger maintained on multiple systems controlled by different entities.	Allows participants to review the blockchain entries. Users can, however, **update the blockchain only by consensus** of a majority of participants.
Is based on a cryptographic P2P network that provides **a single source of truth and irrefutable proof** of existence, process, and provenance.	Uses **triple-entry accounting and consensus** to establish ownership of assets like virtual currency, securities, etc.
Assures **immutability and irreversibility** through cryptography; information cannot be erased once entered.	Records transaction details **without exposing confidential details** of parties/subject involved. Enables **near-real time settlement.**
Can be **public or private**, and the ledger can be **permissioned of unpermissioned**.	Can set business rules about a transaction that are tied to the transaction itself. Enables **smart contracts** whose terms are recorded in computer language and can be automatically executed.

BI INTELLIGENCE Source: Infosys

Cost reductions. Estimates of how much FIs stand to save by implementing DLTs range from $8 billion to $50 billion a year, due to better data quality and reliability in financial reporting, improved transparency and transaction auditability in regulatory compliance, data mutualization between FIs in areas like client onboarding, and the reduced need for reconciliation in clearing and settlement procedures. The world's largest investment banks alone stand to save, on average, 30% across all these departments by 2025 by implementing DLTs, according to a study by Accenture.

Improved compliance. Ensuring regulatory compliance is one of FIs', and especially banks', biggest annual expenditures, as the penalties for noncompliance are severe, and because the volume of new regulations and rule amendments keeps increasing drastically every year. Historically, human error resulting from compliance officers struggling to keep up with unmanageable data volumes has often put FIs at risk of noncompliance. By automating regulatory monitoring and compliance on a centralized ledger that updates in real time, FIs can better ensure they're compliant and avoid fines and reputational damage.

Reduction of human error. Many financial processes, including verifying shipping contracts, processing repurchase agreements, tracking goods shipments, and executing letters of credit, rely on manual, paper-based procedures executed by several employees. This can result in redundancy, mistakes, and irregularities, which cost organizations time and money to investigate and fix. By moving such paper-based processes onto a digital distributed ledger, which standardizes records automatically and gives all parties access to identical data, DLTs could greatly reduce error rates across a swathe of financial sectors.

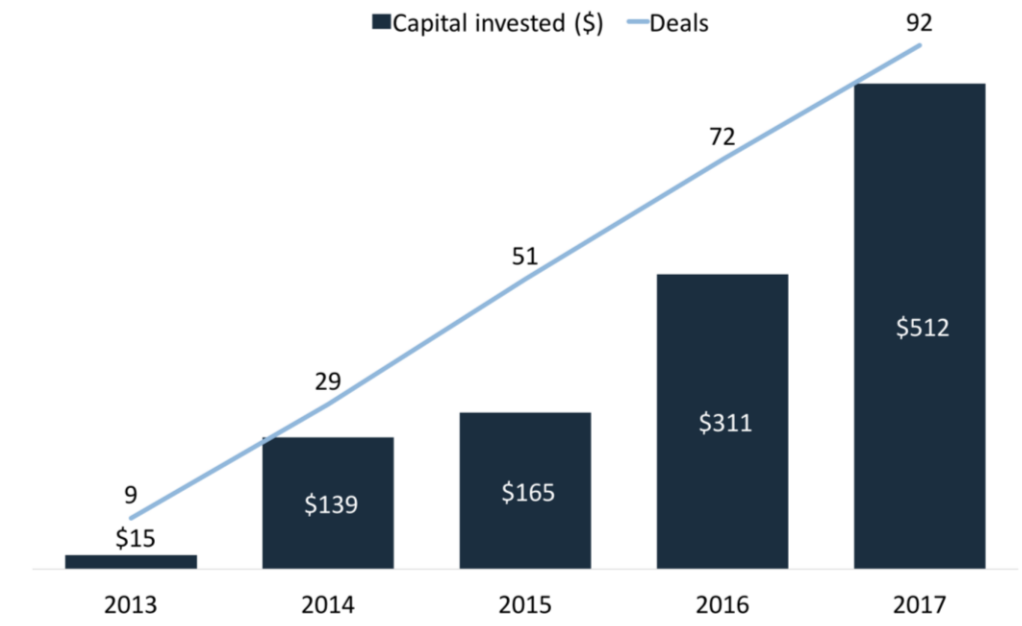
Operational efficiencies. DLTs can reduce operational redundancy for FIs by retaining onboarding data gathered by one organization for a specific client in a central repository that can then be used by another institution. DLTs also offer faster transactions, as clearing times can be made almost instantaneous, because capital markets companies are free from middlemen like brokers. DLTs could therefore cut out central banks from the clearing process altogether.

Improved customer relationships. DLTs can help improve trust and remove friction between FIs and their customers by having neutral smart contracts make judgments on claims processing cases, for example, rather than human staff making a decision. Additionally, FIs could afford to pass on savings from DLTs to their clients, resulting in lower fees and charges: Consumers could save as much as $16 billion per year on banking and insurance fees due to DLT implementation, according to Capgemini estimates. This would help boost customer loyalty and allow incumbents to compete with fintechs' lower pricing.

All DLTs can be used to accomplish these goals, and will achieve similar results due to their overlapping characteristics. However, their slight differences mean that some technologies are better suited to streamline certain transactions. Blockchain's segmented structure, for example, makes it useful for tracking shipments and payments made at every stage of the supply chain, to ensure that capital or goods don't go missing or unaccounted for between stages.

Annual VC Investment In Blockchain Companies

Global, millions, 2018



Source: KPMG

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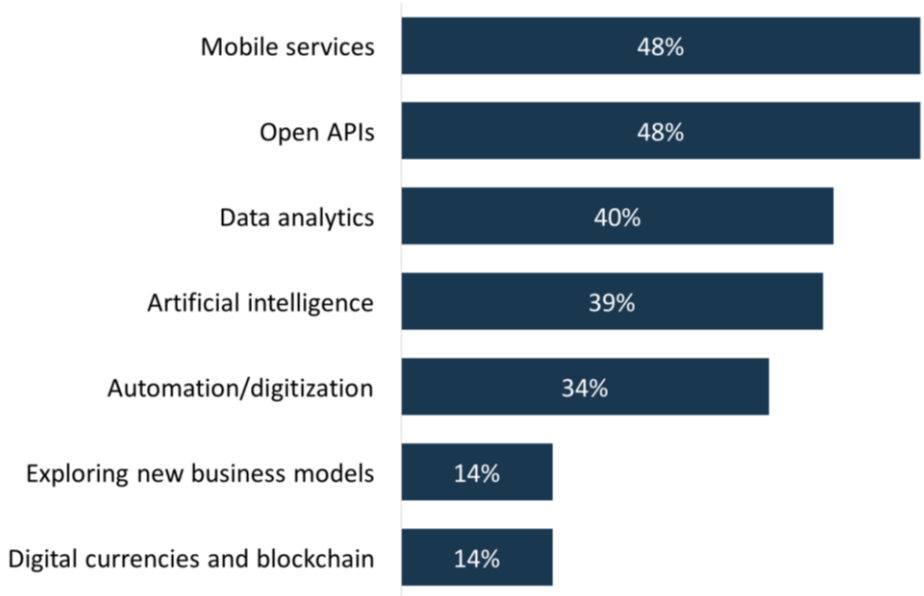
Biggest Business Opportunities For Banks

Global



Source: Magna Carta Communications, n=5,000, 2018

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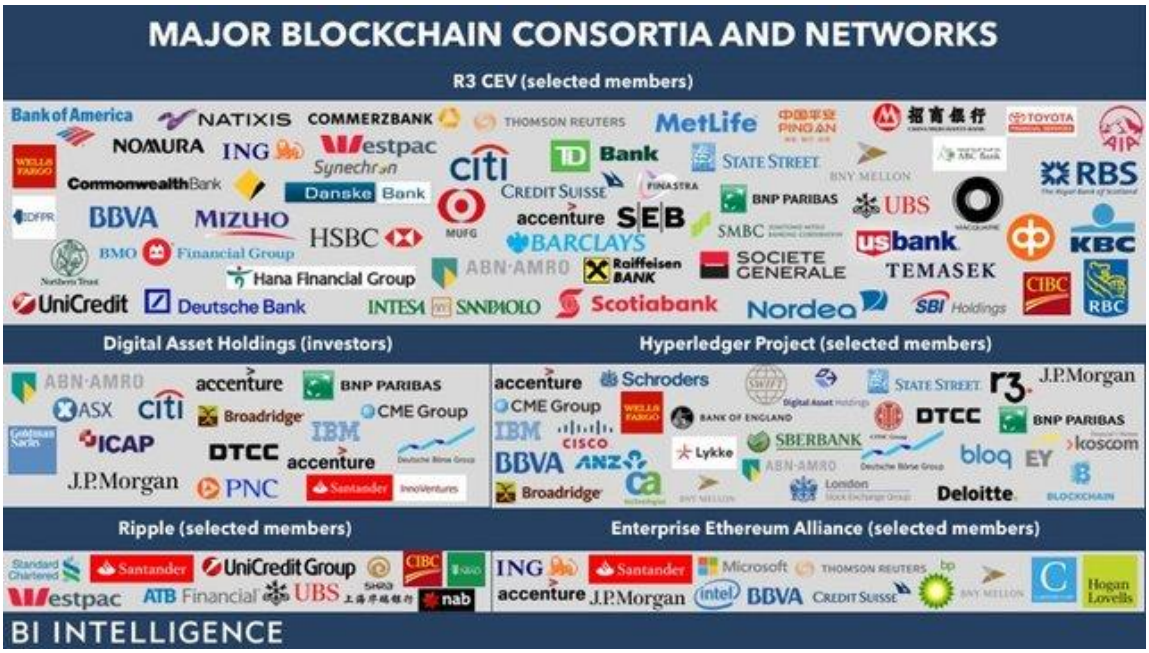
WHERE FINANCIAL INSTITUTIONS ARE EXPERIMENTING WITH DLTS

Retail banking has undoubtedly seen a lot of DLT activity recently, in areas including digital identity verification, payments, interbank transfers, syndicated loans, and credit swaps. FIs in these sectors are testing the technology in different ways, including via independent projects, in industry groups, with blockchain consortia, and through bilateral partnerships with and strategic investments in startups. All of these developments have been explored in more detail in previous Business Insider Intelligence reports. As such, below we will take a closer look at why DLTs are gaining traction in other notable industry segments, examples of pilots from each segment, and the benefits the FIs carrying them out stand to gain.



It's worth emphasizing that the examples selected below are representative of a much wider range of use cases within these sectors, and that the studies included were selected based on several factors. These include significance to the broader market (due to influential participants), a high concentration of activity focused on a particular type of transaction, and a clear-cut description from stakeholders of the benefits they hope to gain from implementing their prototypes.

Capital Markets

Capital markets, which cover everything from post-trade settlement to repurchase agreements, rely heavily on data accuracy and standardization, speed, and consensus between multiple parties often separated by geography and time zones. As such, DLTs' promise of a single source of truth and distributed structure makes them a natural fit for streamlining operations in this space. DLTs are currently being used in almost all subsectors of capital markets, but we'll only look at a few.

Equity Swaps

An equity swap is a financial derivatives contract where future cash flows are pledged to be exchanged between participants at a predetermined date. FIs typically build their own systems for conducting equity swap transactions, which require bespoke connectivity to one another. They then have to continually monitor external factors that might affect an equity swap, some of which require manual updates to the contracts. Because of this complexity, there's no centralized repository for the clearing or reporting of equity swaps.

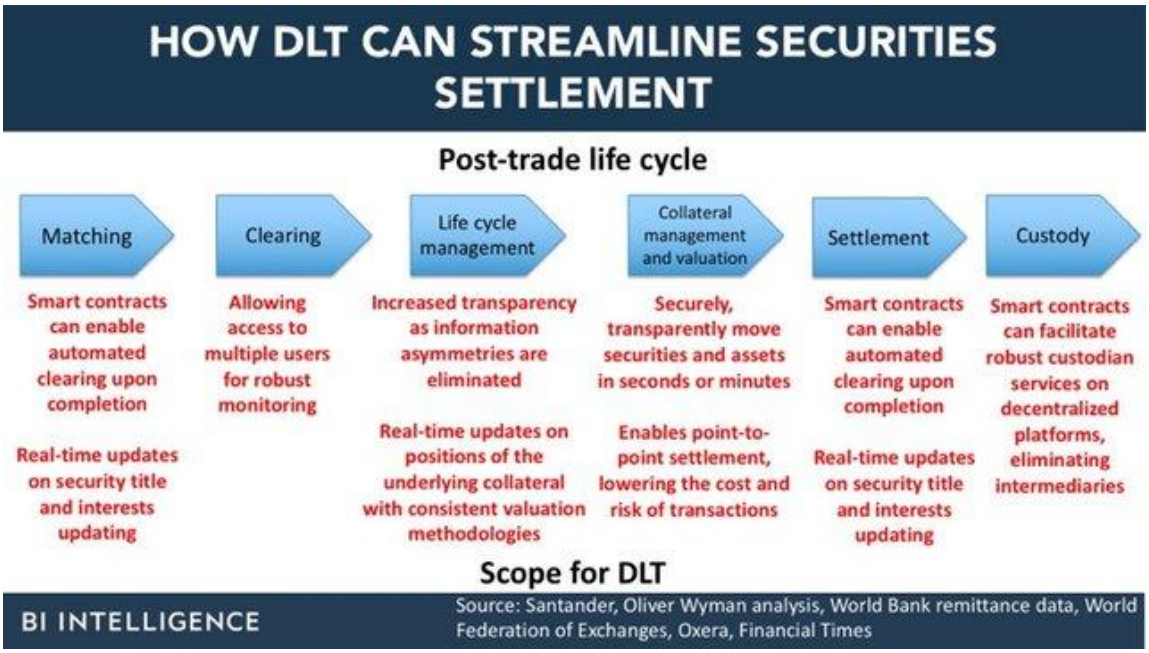
JPMorgan Chase, Credit Suisse, BNP Paribas, and Citigroup teamed up with DLT startup Axoni in 2016 to solve this problem by building a DLT-based platform to streamline equity swaps, which was successfully trialed in November 2017. **The new solution, based on Axoni's smart contract technology, gives all participants in an equity swap access to the same data, making clearing times almost instantaneous and reducing the possibility of disputes.**

Clearing And Settlement

The clearing and settlement process executed by clearing houses and exchanges is central to all capital markets transactions. Clearing, when an intermediary assumes the role of buyer and seller in a transaction to reconcile orders between parties, is essential for the matching of all buy and sell orders. Settlement, the transfer of ownership of a security from a seller to a buyer, is used to settle almost all global stocks and corporate bonds. Although these processes are fundamental to capital markets, they're currently costly and slow — lasting several days at least — and involve multiple intermediaries, says Santander. This means capital is locked up for longer than it has to be, impeding global capital flows.

Some players are applying DLTs to these processes to make clearing and settlement more efficient. Australian Securities Exchange (ASX) announced in January 2016 that it would upgrade its 25-year-old clearing and settlement platform, CHESS, and appointed blockchain company Digital Asset to develop the replacement and deliver cost savings and efficiency to the post-trade settlement process. ASX commissioned a review in August 2017 of Digital Asset's technology, in which tests were conducted by KPMG and the NCC Group to prove the new system's ability to operate at enterprise grade and meet scalability and security requirements. Cliff Richards, executive general manager of equity post trade at ASX, says the exchange "sought additional expert opinion for a variety of reasons including because information security is a highly specialized, complex, and dynamically changing domain, and the implementation of some security requirements can be difficult to fully validate through conventional testing methods."

Finally, in December 2017, ASX confirmed that it will upgrade its clearing and settlement platform using Digital Asset's technology, after the comprehensive review process found the new platform to be enterprise-grade. Its implementation and initial service scope is due for stakeholder consultation in April 2018, when an implementation timeline of readiness activities and a go-live window will be presented. **Richards cites "the availability of synchronized, real-time post trade data, standardized messaging and data structures, and common APIs across multiple market users" as major benefits ASX stands to gain from the upgrade.**



Insurance

The insurance industry is particularly well positioned to benefit from DLTs, as they promises to reduce friction between the many disparate parties involved in an insurance payout, thereby reducing costs and conflicts between carriers and end customers. DLTs can also improve trust between carriers and clients by removing human arbitration from the claims process, and reduce the risk of insurance fraud for carriers since payouts are based on external data sources rather than client testimony.

Marine Insurance

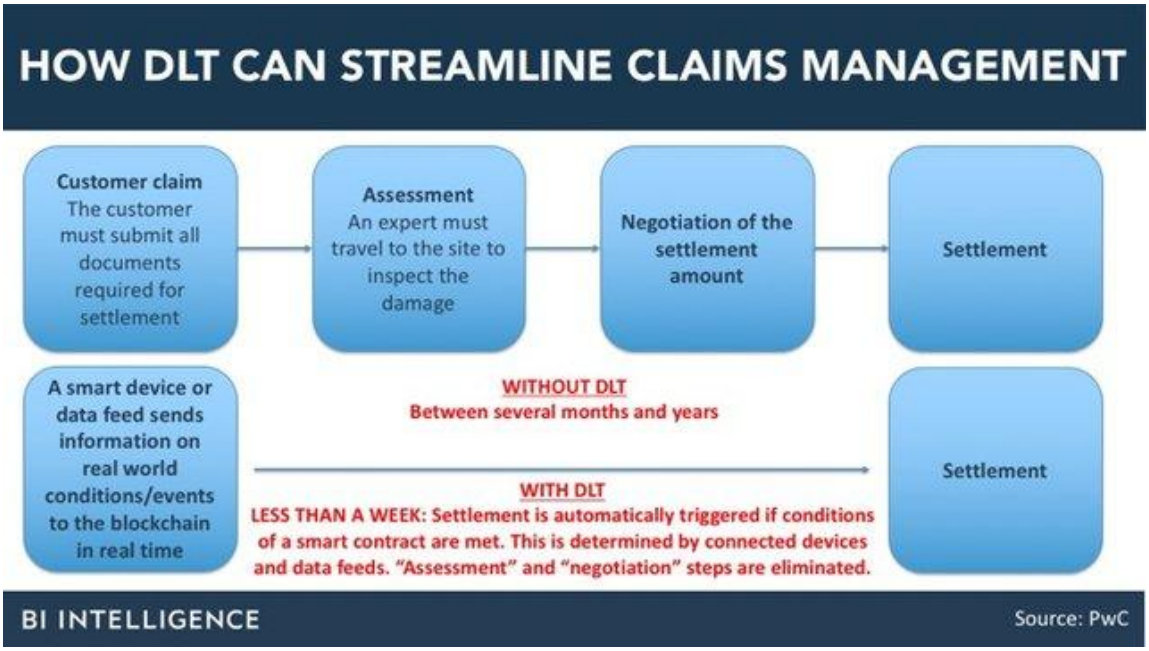
Marine insurance, which covers goods being shipped at sea, has historically depended on the shipping of paper contracts from one port to another to be manually signed. Because of the wide network of parties involved in issuing, transporting, verifying, and signing such contracts, this results in long paper trails vulnerable to tampering and human error, endangering the high-transaction volumes typically involved in marine trade, and reducing transparency, regulatory compliance, and risk assessment for marine insurers and shipping companies.

EY announced in September 2017 that a blockchain technology platform for marine insurance, developed with blockchain fintech Guardtime, was ready for commercial use (ready for enterprise deployment, but not yet live). The platform is based on Microsoft's Azure cloud, and was launched with shipping company Maersk, international insurance industry standards body ACORD, Microsoft, and specialty insurers MS Amlin and XL Catlin. The platform will connect brokers, insurers, and shippers to a distributed ledger that creates an immutable record of details like the identities of a transaction's stakeholders, as well as risk and exposure data related to a specific shipment. That information is then automatically integrated into an insurance contract also registered on the ledger. The platform keeps track of asset data from many parties, links data from disparate sources to policy contracts, and takes into account developments in real time that could affect a shipment and the pricing of an insurance policy. **This should help the platform's users increase transparency, reduce human error, and limit reconciliation and administration costs.**

Captive Insurance

Captive insurance programs are established by multinational organizations as an alternative to purchasing coverage: The companies aggregate assets and collect premiums on them internally, and pay out claims as they arise to the organization's global divisions. A fronting insurer administers the program. These programs span hundreds of countries and millions of dollars in assets. Policy renewals, premium payments, and claims settlements have to be processed manually via email and file transfer, causing delays and a lack of transparency.

Major insurer Allianz has opted for blockchain technology to eliminate these pain points. In November 2017, its Risk Transfer division (ART) successfully tested a blockchain technology-based solution, developed with EY and interface designer Ginetta, for captive insurance programs within an existing ART client's captive program. The new Hyperledger Fabric-based solution instantly connects the parent company, its subsidiaries, and the fronting insurer (Allianz) on a shared ledger, which records all developments and changes in real time. **It aims to make captive programs more transparent, auditable, secure, and efficient.**



Trade Finance

Trade finance, which refers to monetary transactions related to commerce and trade, is a complex sector that hasn't been modernized for centuries, but its issues can be easily resolved through automation. Like insurance, it involves coordination and effective communication between parties that are often on different continents, but it also brings together players from across different industries, such as banking, insurance, and logistics. This means DLTs have a big role to play in streamlining documentation, confirmation, and commodity tracking along supply chains.

Letters Of Credit

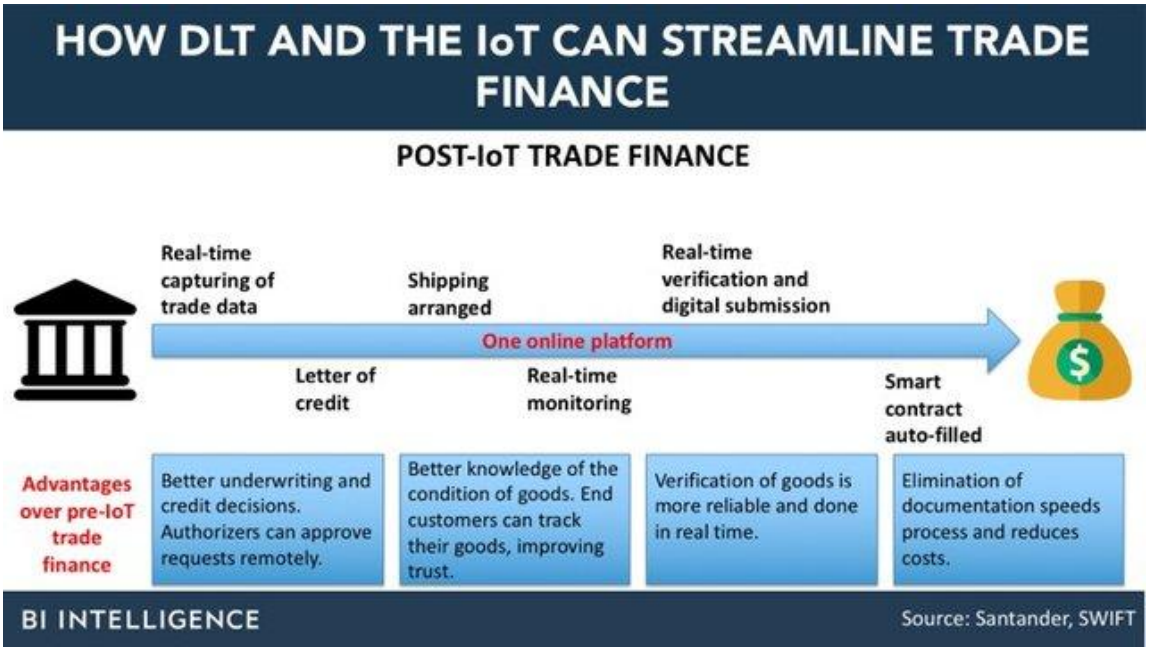
Executing letters of credit, which guarantee that a seller will be paid, and that the buyer won't have to make a payment until the goods are received, is usually a paper-based process vulnerable to human error and delays, and can take up to two weeks.

Spanish bank BBVA is trying to improve this process by using a blockchain solution that it successfully piloted in November 2017 from fintech Wave to automate document processing in an international trade transaction. The pilot involved a live transaction between Spain and Mexico in which Barcelona-based company Frime bought a large quantity of frozen food from Mexico-based Pinsa Congelados using a letter of credit. The letter was issued by BBVA Spain, and processed by BBVA Bancomer, the bank's Mexican outpost. **The parties found that, by moving the document onto a distributed ledger, which allowed all parties to update documents in real time and have access to the same data, Wave's solution cut the process down to just 2.5 hours.**

Open Accounts

An open account transaction refers to an international trade in which goods are shipped and delivered before payment can be collected. At the moment, such trades depend on successful collaboration between multiple disparate parties, and involve manual processing of documents, opening them up to delays and human error, and raising the stakes for the party awaiting payment.

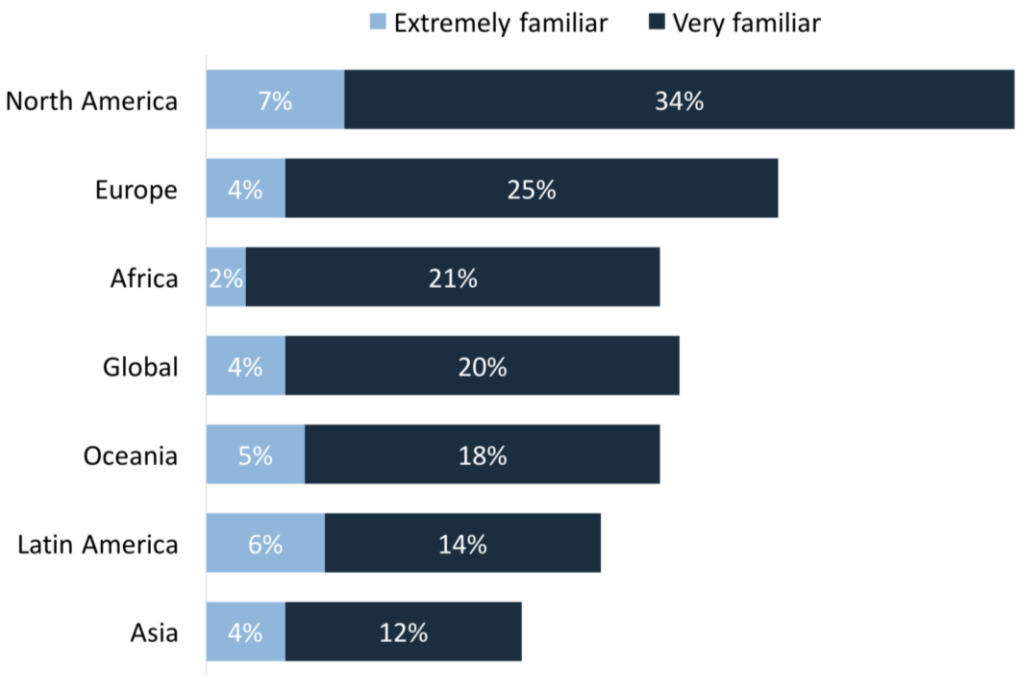
DLT consortium R3 and trade finance fintech TradeIX are working with 12 major FIs — including Barclays, BBVA, BNP Paribas, ING, and Wells Fargo — on a suite of DLT-based solutions to streamline open account trade finance. The suite will be based on R3's Corda platform and TradeIX's software, and will include trade-specific APIs, a regtech tool, and a distributed ledger for trade data, contracts, and transactions. The project's first phase involves creating a smart contracts system for parties involved in open account trade finance, and the second phase will see R3 and TradeIX building more tools and inviting additional FIs to participate. **R3 says the suite will cut costs, boost transparency, and improve compliance for all parties involved in this type of trade finance.**



EFFORTS TO MAKE DLTS MORE ACCESSIBLE TO FINANCIAL INSTITUTIONS

Despite the huge potential FIs see in implementing DLTs, and the many pilots being conducted with these technologies, major obstacles embedded in the technology itself are still holding many firms back from moving past the testing stage. These include security, control, and worries about oversight and governance in sharing information on a distributed ledger. Some players have recognized that DLT adoption by FIs is unlikely to take off unless these concerns are alleviated, and are accordingly tweaking the technology.

FI And Fintech Executives' Familiarity With Blockchain Technology



Source: PwC, n=1,308, 2017

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ING: Improving Data Privacy And Security

The Dutch banking giant rolled out its Zero-Knowledge Range Proof (ZKRP) solution in November 2017, which is designed to allow FIs a degree of confidentiality when using a blockchain platform. The ZKRP solution can analyze an encrypted data set without revealing its contents on a shared blockchain. For example, someone applying for a mortgage via a blockchain tech platform can prove that their salary sits within a certain range without disclosing their precise income.

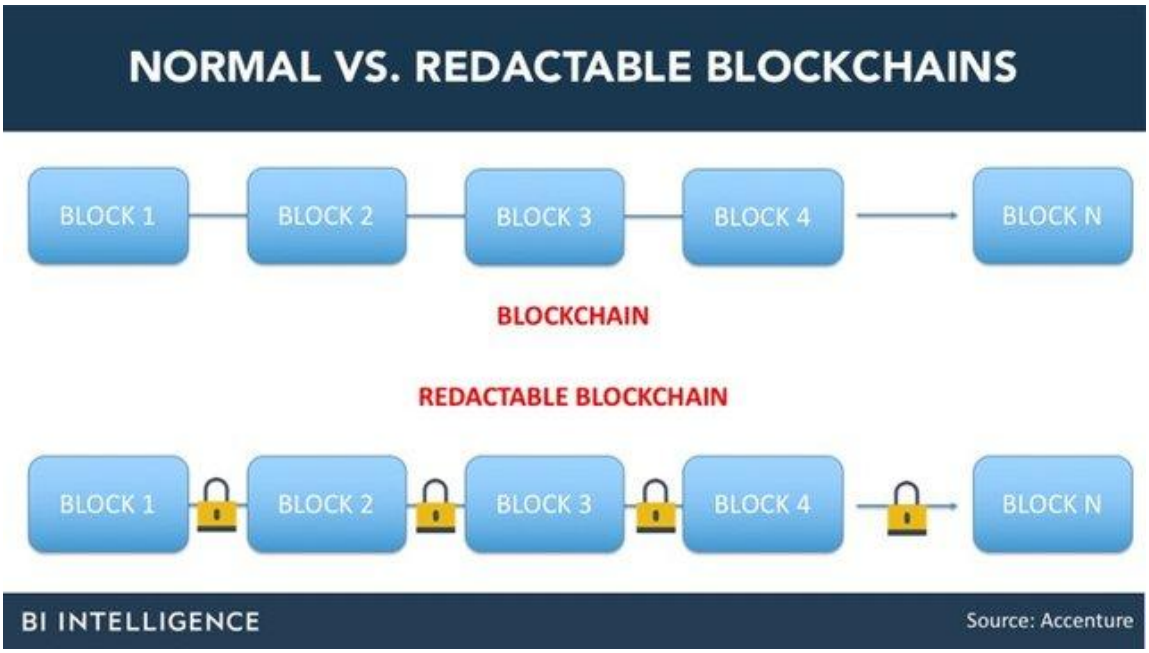
Despite FIs' growing interest in using blockchain technology, many are held back from moving forward by data privacy and security concerns, according to ING, which it says its zero-knowledge range proof solution is designed to allay. While zero-knowledge proofs (ZKPs) aren't new, and are widely used on the Ethereum network, ING says that its solution was shown to be some 10 times more efficient than existing alternatives. Moreover, ING has made the solution's code open source to allow interested FIs and developers to suggest improvements to the tool. Mariana Gomez de la Villa, global team lead of distributed ledger technology at ING Wholesale Banking, said opening the solution up for comment means the bank "can be challenged on [its] own technology and that only leads to more improvements," and added that feedback from parties including MIT and Ethereum cocreator Vitalik Buterin is already being implemented. ING has not yet integrated the solution into any blockchain platforms, but is working with the EEA to introduce the ZKRP tool into the Ethereum network and JPMorgan Chase's Quorum platform.

The premium FIs and their clients put on data privacy and the safeguarding of transactions means that if and when blockchain tech use does start happening broadly in FS, it will require specially designed solutions that result in a greater degree of control over information in a shared forum, rather than more general-use platforms.

Accenture: Increasing Control

Consultancy Accenture unveiled a tool in 2016 that allows FIs to “edit” blockchains, and won a patent for it in September 2017. The tool allows FIs to intervene with a blockchain "under extraordinary circumstances" to fix human errors, adjust to regulatory or legal changes, or prevent sabotage. It's targeted exclusively at permissioned blockchains to ensure only a trusted administrator has these powers. Accenture has explained that, if someone tries to alter a block on a conventional blockchain, it would compromise the algorithms that keep the system running. Even if enough participants agree to make a change, altering one block means all others have to be altered correspondingly, which is usually disruptive and prohibitively expensive, making changing a conventional blockchain virtually impossible.

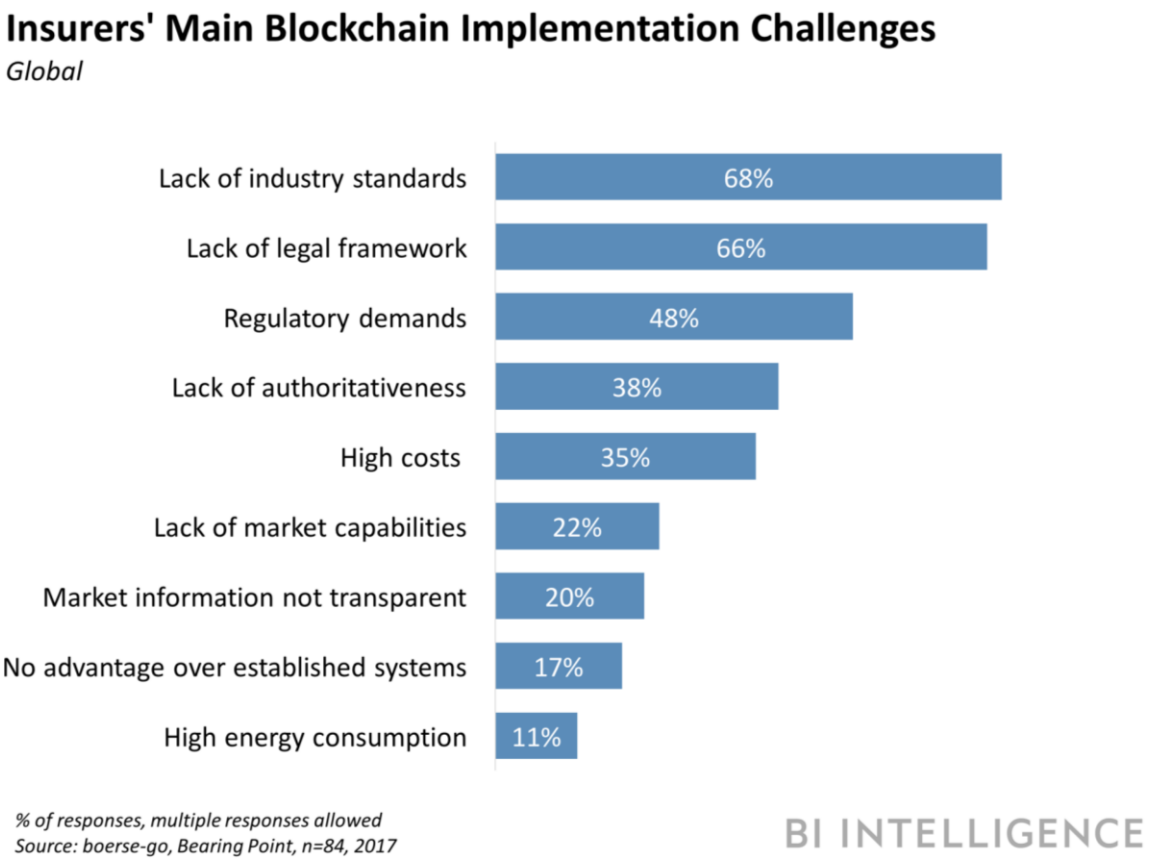
Accenture's solution caused uproar, with some arguing that it went against one of blockchain's inviolable principles: its immutability. Accenture counters that the only way to bring the technology to maturity and ensure enterprise adoption is to allow users to correct errors and intervene in cases of fraud. The consultancy may be onto something, as FIs want to have control over the system if something goes wrong. As such, FIs' demand for an editing feature seems undoubted; Accenture said in September 2017 that it had already had a lot of interest from enterprise clients.



R3: Making Compliance Easier

The consortium integrated regtech Accuity's financial fraud screening capability into its FI-targeted DLT platform Corda in October 2017, enabling Corda's users to ensure regulatory compliance when using distributed ledgers more easily. Corda users can now scan transactions conducted on Corda within the platform using an "oracle node," which establishes a secure link between a DLT-based smart contract and external data sources. Normally, users would have to export the transactions to analyze them, causing delays and risking human error. Each transaction will be cross-referenced with regulations such as 4MLD, the US Patriot Act, and guidelines issued by financial regulators to help Corda's FI users ensure they're compliant, saving FIs time and improving their compliance standards.

Forty percent of FIs name regulatory and legal concerns as obstacles to DLT adoption, with this figure rising to 48% in sectors like insurance, but integrating regtech features like Accuity's could help. Accuity is planning to strike similar deals with R3 competitors Hyperledger and Ethereum, suggesting that embedded compliance tools will soon become the standard.



While efforts like ING's, Accenture's, and R3's are steps in the right direction, there are still other obstacles holding widespread DLT adoption in FS back. FIs looking to deploy DLTs face difficulty acquiring staff with the technological knowledge necessary to bring DLT pilots to fruition, as deep understanding of such a complex technology is often missing at legacy institutions, especially at the executive level where investment and roadmap decisions are made. Additionally, achieving interoperability between disparate blockchains and distributed ledgers is a speed bump, although more attention is now being devoted to this area.

Another obstacle for FIs is amassing a network effect for their solutions, which is essential to realizing the decentralization benefits of a distributed ledger. It's often made difficult because of how closely FIs guard their data and intellectual property, and the rivalry between big firms. There is also still a lack of regulatory clarity on DLT and smart contract use in such a highly regulated industry. And more basic regulatory hurdles remain: ING's Gomez de la Villa says that just getting regulators to accept digital versions of documents like Euro Commercial Papers would accelerate progress.

THE NEXT PHASE: GOING LIVE

Although there's no shortage of DLT pilots underway in the FS industry, very few of these have gone live. However, there are a few exceptions, even in the West, where DLT progress has been far slower than in China. Below, we take a look at FIs that have taken their solutions live, or are making rapid headway in doing so, and what others can learn from their progress.

The Depository Trust And Clearing Corporation (DTCC)

One of the US' largest clearing houses, the Depository Trust and Clearing Corporation (DTCC), is planning to move its entire credit default swaps (CDS) clearing platform onto a new blockchain tech-based system in Q1 2018, it announced in May 2017.

DTCC first announced the new platform in January 2017. It leverages blockchain technology from Axoni, with IBM providing program management, and R3 acting in an advisory capacity. The platform will be a permissioned, blockchain-based solution that will host the DTCC's Trade Information Warehouse (TIW), a database that stores all information related to CDSs handled by DTCC. The new version of TIW will automatically log trade details in a cloud-based ledger accessible to all participants, which can only be edited with multiparty agreement. The new platform aims to reduce the possibility of human error, as well as the resources associated with existing manual processes, enabling the reduction of operating costs to benefit both DTCC and its clients. The DTCC clears some $11 trillion of CDSs daily for FIs including investment banks, according to Nasdaq.

The centrality of the DTCC in the US and global financial systems, as well as the systemic significance of its clients, have likely played a part in the solution's progress. Numerous market participants, including global banks JPMorgan, Credit Suisse, and UBS, provided their input on the new solution: These clients have a vested interest in ensuring the solution launches smoothly, as it stands to unlock capital and boost efficiency for them. And, because the DTCC already caters to many of the world's largest banks, this has given it a ready-made network effect, as well as helpful insight and stakeholder input along the way. Once the new system launches, it could pave the way for other clearing houses to move forward with their DLT projects.

AXA

French insurance giant AXA launched a flight-delay insurance product, Fizzy, in September 2017. Fizzy stores and processes claims payouts via smart contracts based on Ethereum's public blockchain. In an interview with Business Insider Intelligence, Laurent Benichou, director of R&D at AXA, said the solution is fully live, but isn't widely advertised yet, as user numbers are being kept deliberately low while final technological kinks are ironed out. Customers are compensated in euros for now, but they'll be able to make claims in cryptocurrencies including Ether by 2019 at the latest. Benichou says that the project's priority for 2018 is to grow its distribution network of travel agencies and airlines.

AXA says using smart contracts stands to deliver two major benefits. First, it could streamline the compensation process for both providers and claimants. When an AXA customer buys flight-delay insurance on the Fizzy platform, the purchase is automatically recorded on an Ethereum-based immutable ledger, and a smart contract is created on the blockchain. The smart contract is linked to global air traffic databases, which means that as soon as a delay of over 2 hours is registered on the ledger, compensation is automatically triggered. Moreover, the customer is told how much they'll receive when they first buy the coverage. Second, it promises to improve the insurer-customer relationship. The need for a customer to file a claim is removed, and the compensation decision is delegated entirely to a smart contract, which eliminates potential disputes between insurer and client. This should build up trust between customers and their insurance providers, whose interests are often seen as being at odds.

Fizzy's success may be attributable to the fact that, from the beginning, it was conceived of as a real-world solution, rather than an experiment. Benichou, who heads the project, comes from a cryptocurrency and blockchain background, and says that he came to the project with the feeling that "there was too much talk and not enough real life projects in blockchain," and that it was time to realize the technology's hypothetical benefits. Arguably, this approach is in sharp contrast to many other incumbent FIs, where pilots are often conducted to explore the potential gains of DLT implementation. Second, there is a dearth of technology talent at many legacy institutions, which, in the case of technologies as nascent and complex as DLTs, means that projects may end up run by people who have only a rudimentary understanding of the tech. As such, bringing a person with a deep knowledge of DLTs to spearhead the project is likely partially what has allowed AXA's initiative to pull ahead of its peers'.

Cases like the DTCC's and AXA's are promising, as they're evidence that the FS industry's longstanding DLT limbo isn't a permanent state, and that these pilots will eventually start going live and fundamentally transforming all areas of finance. For now, the DTCC and AXA will remain the exception rather than the rule, as obstacles discussed above still stand in the way of widespread DLT adoption in the industry. However, progress is happening: This March, R3, fintech HQLA-X, and partner banks Credit Suisse and ING Group completed the first live securities lending transaction, and a spate of other DLT solutions are scheduled for launch in 2018.

Meanwhile, on the regulatory front, we're beginning to see progress across different geographies, which, given the importance of regulation to how willing FIs are to innovate, promises to bring about a sea change in time. For instance, the French government amended its securities trading laws in December to allow shares in unlisted companies to be issued and traded on distributed ledgers, instead of having to go through centralized intermediaries like clearing houses, starting in 2018. Meanwhile, the UK's FCA has clarified that FIs can leverage DLTs under its existing rules, while Gibraltar established specific DLT legislation in December, all of which promises to give FIs more clarity. Moreover, regulators like the FCA are even beginning to leverage DLTs in their own work, suggesting that room is slowly being made for the tech in the global financial system.

THE BOTTOM LINE

- DLTs are proving attractive to the FS industry because of their ability to act as a single source of truth.
- Blockchain and smart contracts could save the industry up to $50 billion a year through improved operational efficiencies, reduced human error, and better regulatory compliance.
- Although DLTs are being explored in various sectors of FS, actual implementation of DLT-based solutions is still low. This is due to a lack of tech talent at legacy institutions, a vague understanding of the tech and how it works, and pitfalls embedded in the tech itself.
- But some players are actively trying to make DLTs more usable in order to spur adoption by making editable versions of DLTs, embedding regtech features in DLT platforms, and boosting data privacy on distributed ledgers.
- A few FIs have pulled ahead of the pack and are very close to taking their DLT projects live, or have done so already, presenting useful case studies for other institutions interested in using DLTs.

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