



Blockchain in Financial Markets: How to Gain an Edge

By taking a systematic approach, companies can manage through the uncertainty surrounding distributed ledger technology—and achieve a strategic advantage.

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This study was done in collaboration with Broadridge, a leading provider of investor communications and technology-driven solutions to capital markets, wealth and asset management firms and corporate issuers.

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With all the noise surrounding distributed ledger technology (DLT), you'd expect participants in financial markets to be racing full-bore to get ready for it. But many are not. Part of the reason is concern about the scope and cost of the challenge. Presented almost daily with new claims about blockchain's disruptive and revolutionary potential, many executives have begun to wonder how much benefit they'll actually see from DLT in the near, or even medium, term.

Business leaders now confront a seemingly impossible and contradictory situation. They're dealing with a technology that has been simultaneously overhyped and underestimated. While DLT is making inroads into some areas of banking, such as cross-border remittances, the path to implementation across broad and diverse financial markets is less clear.

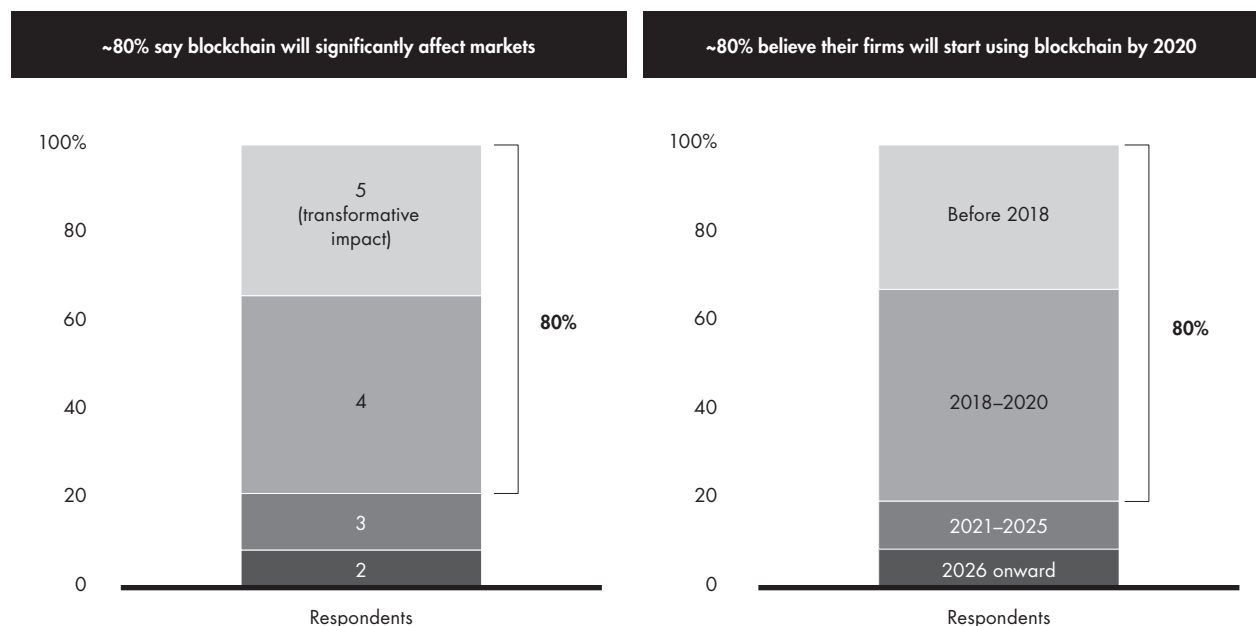
Financial market participants know DLT is coming. About 80% of executives at financial institutions surveyed by Bain & Company believe DLT will be transformative and

will significantly impact markets, and a similar percentage expect their organizations to begin using it before 2020 (see Figure 1).

Nonetheless, it is hard to predict exactly when and where DLT applications will reach scale and what kind of impact they will have across markets. It's unclear how the regulatory environment will evolve in different jurisdictions. Getting ready for DLT requires substantial investment at a time when many firms are facing financial constraints, and it can involve working through tricky and expensive issues with legacy IT systems and processes.

Financial executives interviewed by Bain say they are under pressure to show near-term results, and they must gain the attention, understanding and commitment of top management. Some firms have embraced the technology, while others have opted to do nothing, or very little, given all the uncertainties about DLT. "Everyone is struggling with business cases and exactly where to apply their efforts," said one executive Bain inter-

Figure 1: 80% of financial market participants say distributed ledger technology will be transformative and expect their firms to adopt it by 2020



Source: Bain Blockchain Survey, 2016 (n=53)

viewed. Among the market participants Bain surveyed, 38% said they've adopted a wait-and-see approach to the technology.

Other firms are deliberately trying to slow some things down, not just for themselves, but for the whole industry. Some companies have an incentive to try to preserve the status quo—and their place in it—for as long as possible. One senior executive Bain interviewed who represented his firm on a blockchain consortium working group said, “Half of the people in the group are looking for a solution; the other half are there uniquely to obstruct progress.”

Sizing up DLT opportunities: The use cases and market archetypes

In this kind of competitive landscape, where some firms have invested aggressively, others struggle with near-term business cases and still others resist change, companies willing to be proactive and strategic can gain an edge. These firms understand the need to be ready to take advantage of a potentially revolutionary technology, one that may upend a broad array of financial activities.

The financial executives surveyed by Bain expect DLT to have a big impact on financial markets—particularly on those activities that take place after a trade is made. In the Bain survey, 81% said they expected DLT's impact on clearing and settlement to be “transformative.”

In the same survey, 49% said they have entered into partnerships with other firms, often fintech start-ups, to develop DLT projects, and 32% have joined an industry consortium. Roughly one-third of the firms are conducting small, isolated experiments in particular locations or asset classes—an innovation lab approach. Some have carved out niches where they can invest a modest amount in DLT and pursue an early, if limited, return on their investment.

With DLT, the ledger has one shared and constantly updated version of the truth, changing the need for a central intermediary. DLT generates a secure, immutable historical record and a full audit trail. There are many potential use cases for DLT along the financial

markets value chain, ranging from tokenization of assets—which allows for incontrovertible proof of ownership linked directly to the security—to reference data for indexes and other benchmarks (*see Figure 2*).

For companies considering the use of DLT, an important first step is to establish a clear view of the technology and the scope of its likely impact on the market. Once a company has a perspective on how DLT is likely to evolve in the areas in which it does business, it can develop a systematic approach and a multiyear roadmap to manage the uncertainty to its advantage.

DLT is likely to arrive first in those markets that are “primed” for it. DLT-ready jurisdictions include those in Asia-Pacific and Latin America that have a centralized and integrated infrastructure run by a single exchange and a proactive regulator who can work together to drive innovation.

Markets are likely to develop into four distinct archetypes, each with distinct implications for how and when individual firms should adopt DLT (*see Figure 3*). First, in large, complex, but mostly domestic markets such as Japan and China, DLT is more likely to reinforce a relatively integrated structure for cash securities. By contrast, DLT may have the opposite effect in the second archetype, large financial hubs, such as the US and major European markets. In these jurisdictions, DLT could foster an even more unbundled and fragmented market structure, with multiple exchanges and utilities.

Among the four archetypes, it is the third one—smaller, domestically focused markets like Australia, Canada and Brazil—where DLT could have the earliest impact in cash securities. These markets, which are already integrated and centralized, face fewer obstacles than the other archetypes. They can evolve holistically, with participants and regulators working closely together.

The fourth archetype—small markets with international connections, including Singapore and Hong Kong—is likely to remain integrated for cash securities but more subject to global market practices and links in derivatives and OTC.

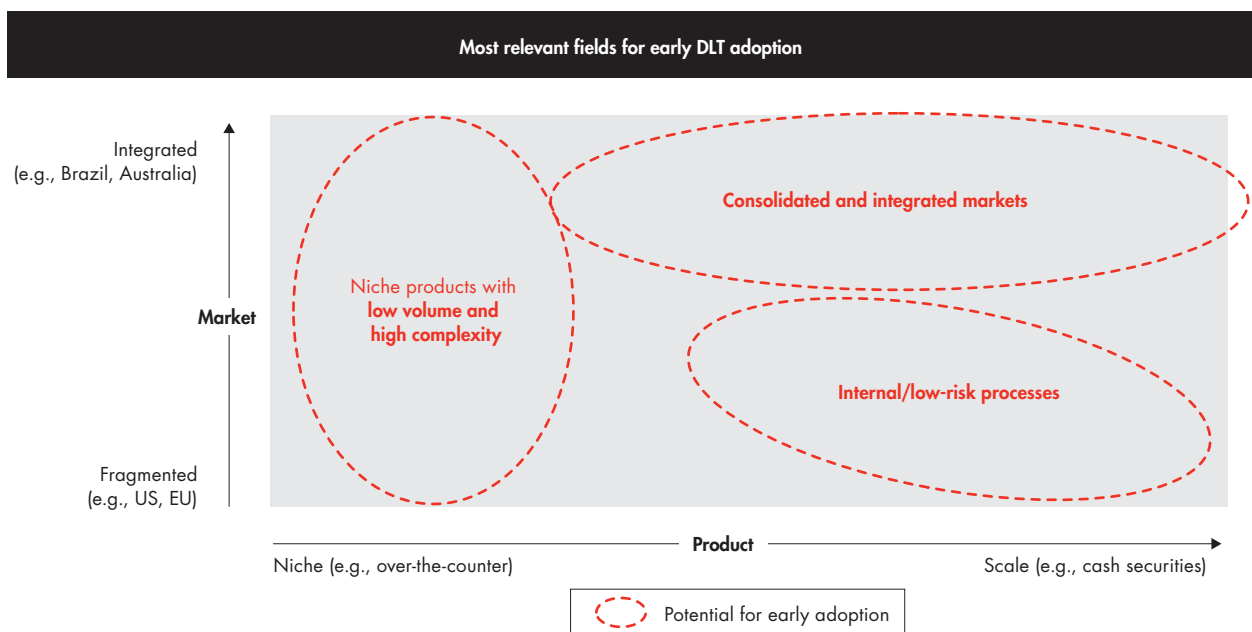
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Figure 2: DLT has the potential to address pain points across the value chain, but it faces challenges

	Use case	Current pain points	DLT benefits	Challenges to adoption
Pre-trade	KYC/AML	<ul style="list-style-type: none"> Redundant efforts 	<ul style="list-style-type: none"> Single source of data; eliminates duplication 	<ul style="list-style-type: none"> Regulatory uncertainty and data standardization
	Asset tokenization (e.g., for syndicated loans)	<ul style="list-style-type: none"> Lack of standardized/automatic processes 	<ul style="list-style-type: none"> Proof of ownership and provenance Increased efficiency and lower costs 	<ul style="list-style-type: none"> New regulatory requirements
Trade	Ownership & transaction history ledger	<ul style="list-style-type: none"> High costs; counterparty risk 	<ul style="list-style-type: none"> Ownership, cash, collateral and transaction history recorded on DLT 	<ul style="list-style-type: none"> Reluctance to invest
	Cash or liquidity ledger	<ul style="list-style-type: none"> Manual processing; lack of standardization 	<ul style="list-style-type: none"> More efficient clearing and settlement For derivatives, smart contracts reduce risks and collateral requirements 	
	Asset servicing	<ul style="list-style-type: none"> Redundant and resource-intensive efforts 	<ul style="list-style-type: none"> Single source of truth; efficiency from auto-execution of smart contracts 	
	Reference data	<ul style="list-style-type: none"> Data error produced by reconciliation efforts 	<ul style="list-style-type: none"> Single source of data; increased efficiency and accuracy 	
Post-trade				<ul style="list-style-type: none"> Getting widespread buy-in across ecosystem Coordination and standardization across data providers

Notes: KYC stands for Know Your Customer; AML stands for anti-money laundering
 Sources: Bain DLT interviews; Bain analysis

Figure 3: Early DLT adoption will most likely occur in niche products, internal or low-risk processes, and integrated markets



Source: Bain & Company

Rethinking market ecosystems

Across jurisdictions, DLT has the potential to transform settlement and clearing. While a trader can now execute a transaction at lightning speed, it can take as long as three days for that transaction to settle. With DLT, execution, clearing and settlement could occur simultaneously, minimizing liquidity and credit risks. This move from net to gross settlement, however, would require significant changes in the mechanics of funding and represents one of the biggest questions facing the use of DLT.

Certain asset classes and activities are ripe for early DLT adoption. Among the most promising areas are complex OTC derivatives, such as renewable energy contracts. These markets have a relatively small number of participants, making it easier to reach a consensus on systems and policies. Because volumes are relatively low, less investment is required—especially in replacing legacy IT—so the risks are contained.

Several DLT projects focused on these types of products are well under way. Euroclear and Paxos have piloted a blockchain settlement service for gold bullion trading in London, which they plan to roll out in 2017. The Royal Mint and CME Group have also announced plans to launch a blockchain-based gold trading platform this year. In the US, NASDAQ is using DLT on its Private Market platform to help with the issuance, transfer and management of private company securities.

The Depository Trust & Clearing Corporation (DTCC) and a consortium that includes IBM, Axoni and R3 have successfully tested a system using DLT and smart contracts to manage post-trade services in the \$11 trillion OTC market for cleared and bilateral credit derivatives.

DLT can also play a role in improving reference data, including benchmark interest rates like Libor and physical commodity prices, replacing existing survey processes that are opaque and subject to abuse. With a DLT-based benchmark-setting mechanism, possibly administered by an industry-wide utility, data from spot transactions could be directly captured. This means reference prices

could be based on actual traded spot transactions rather than surveys—a development that would be of keen interest to asset managers.

Beyond trading, DLT has the potential to change the way firms interact with their clients in areas such as proxy voting, digital identity management and Know Your Customer (KYC). Broadridge, a global leader in proxy communication services, invested \$135 million to acquire the technology assets of Inveshare. Broadridge is using that technology to help make US proxy voting become more efficient, secure and transparent. The state of Delaware, where many US companies are registered, is working on legislation that would allow the issuance of digital shares using DLT and smart contracts. The Monetary Authority of Singapore is sponsoring the formation of a KYC utility. Using DLT, banks can embed KYC information required by regulators into the record of a transaction, avoiding costly duplication of efforts. A KYC utility, by lowering and mutualizing the cost of compliance, can eliminate barriers of entry, making KYC affordable for new, smaller participants.

All told, DLT has the potential to significantly benefit financial markets. Bain research estimates annual cost and capital savings could amount to 1 to 3 basis points of total global assets under management, or about \$15 billion–\$35 billion. Much of these savings will come from the ability of firms to replace manual, redundant and error-prone processing methods. Firms will also be able to quickly and less expensively harness reference data that is both richer in detail and more fully reconciled. That should create opportunities for growth and product innovation.

The gains from DLT won't be evenly distributed. In some cases, DLT will enable some firms to become more efficient and increase profitability, but in other cases these productivity gains may not boost margins. As with any cost-reduction initiative, exchanges, banks, securities firms, asset managers and other intermediaries will face competitive pressure to pass the savings on to their customers, meaning the main beneficiaries of DLT efficiencies are likely, ultimately, to be issuers and end-investors. In fact, the executives surveyed by

Bain says DLT is likely to have a negative effect on both the revenues and profits of clearinghouses and custodians (see Figure 4).

Across the board, market participants will need to adjust to falling industrywide cost structures and new uses of reference data and analytics. Those firms able to reduce their own costs and develop better reference data ahead of the curve should gain significant advantages that can be translated into near-term profitability, enabling them to pay down their investments. Over time, they should have the ability to gain share as parts of the industry consolidate.

Mutualizing the migration cost

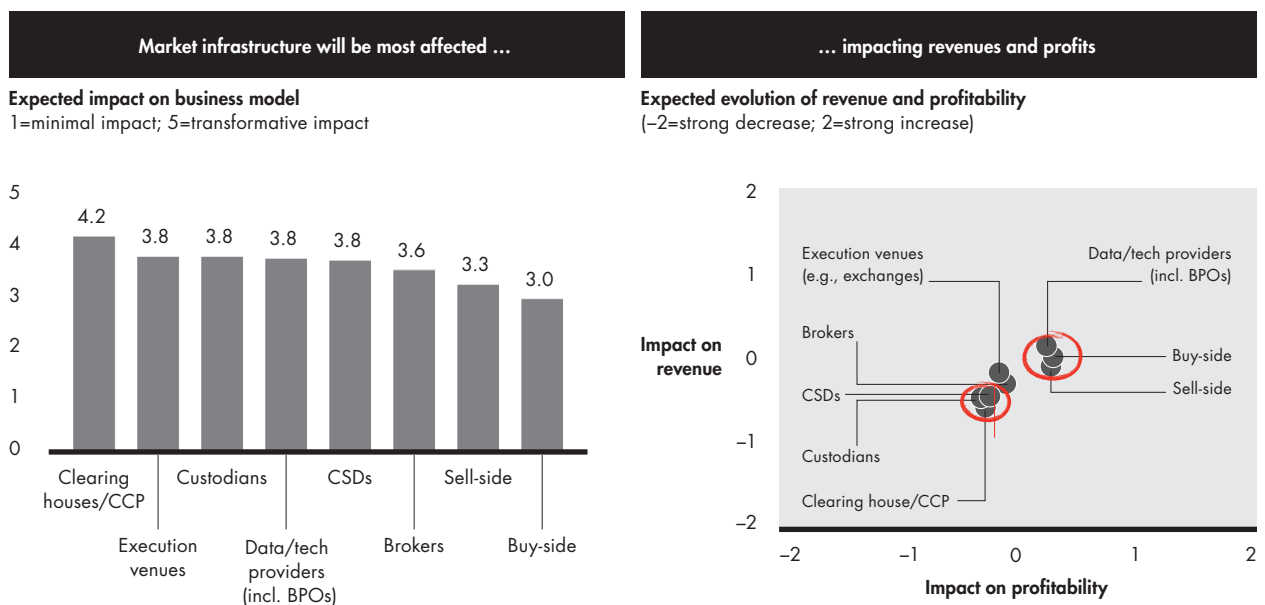
As financial markets evolve with respect to DLT, companies will face game-theory-type decisions. If they promote the early adoption of DLT across the ecosystem, they may benefit, but they may also end up disrupting their own economics and competitive positions. Yet if they're slow

to embrace DLT, they run the risk of being left behind. "No one wants to be first," said one executive Bain interviewed, "but no one wants to be last either." This dilemma is exacerbated by the fact that the biggest impact from DLT will be achieved only when a critical mass of the ecosystem participates.

The most valuable DLT innovations can't be developed in isolation; they require collaboration among participants, exchanges and regulators. Along the way, there will be winners and losers, generating friction and conflict. With so many participants involved across so many jurisdictions and asset classes, the adoption process will be messy and piecemeal—and this is the heart of the challenge.

As executives develop a strategy for DLT, they may want to keep in mind the 18th-century adage popularized by Benjamin Franklin: "We must, indeed, all hang together, or most assuredly we shall all hang separately." Going it alone on DLT can be expensive and risky. It may

Figure 4: Infrastructure providers are most likely to face disruption



Note: CCP refers to central counterparty clearing house; BPO is business process outsourcing; CSD is Central Securities Depository; numbers have been rounded
Source: Bain Blockchain Survey, 2016 (n=53)

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make more sense to share the costs as well as the benefits through industry utilities. They can be run by market participants themselves or outsourced to a technology company or other third-party providers.

IT vendors and business-process outsourcing firms (BPOs) are pushing ahead to help clients use DLT to address market inefficiencies. IBM, for example, as part of its work with the Linux Foundation's Hyperledger project, has teamed up with the Japan Exchange Group to test DLT applications in low-volume securities trading. Broadridge, in addition to its proxy effort, is working on various DLT projects in securities lending and processing and collaborating with fintech firms through its minority stake in Digital Asset Holdings (DAH) and participation in the Hyperledger Project. Thomson Reuters, IHS Markit, Capco (part of FIS) and a multibank working group organized by blockchain provider Axoni have successfully tested blockchain technology and smart contracts to manage affirmations and post-trade lifecycle processing for OTC equity swaps.

Service and infrastructure providers are working to help firms migrate their current processes to more efficient, DLT-enabled operating models. However, even if these third-party solutions can help mutualize part of the investments in infrastructure, the transition will not be trivial and represents one of the biggest obstacles to widespread DLT adoption. In most cases, legacy and DLT processes will need to run in parallel during a migration period—at least across some asset classes, processes and geographies.

In highly competitive markets, banks and other participants whose profits are already under pressure will often resist investing in a technology with benefits still unproven. Given that reluctance, the leading DLT disrupters are likely to be the big IT vendors and BPO providers, along with blockchain technology companies such as Axoni, R3 and DAH, which are able to mutualize development and implementation costs across participants.

Centralized and integrated markets, where there are a relatively small number of major competitors, may

lead the way on utilities. The Monetary Authority of Singapore, for example, in addition to the KYC utility initiative, is sponsoring the development of open Application Program Interface (API) guidelines for the financial sector that will help encourage the formation of utilities. In larger, more complex and more unbundled markets, by contrast, early DLT innovation is likely to develop in pockets, such as corporate actions and OTC products, as third parties find niches where they can make the ecosystem more efficient.

Getting ready for DLT

One way or another, firms that want to reap the benefits of DLT will have to make significant changes to their processes, policies and IT architecture. Leading financial firms around the world have already embarked on major efforts to overhaul their IT systems to make them ready for digital. As part of their efforts to modernize their IT, these companies are taking some of the preparatory steps that will be necessary for DLT. These moves may put them years ahead of rivals who have not made as much progress in addressing legacy issues.

Even though there is as yet no set timetable for when clear standards and regulations on the use of DLT in financial services will be developed, firms can take steps now to get their IT systems and processes ready. For example, they can develop an end-to-end IT security framework that will work with a technology as disruptive as DLT. Test labs and trial use cases are particularly valuable for learning about the security challenges of DLT, and third-party providers can provide meaningful assistance.

Another aspect of getting IT ready for DLT is open APIs, which will be critical to successful adoption of many blockchain and smart contract protocols. The European Union, for instance, will require banks to have open APIs for some functions as early as 2018. Many questions remain unresolved, including how the eventual role of digital fiat currencies will be included, how ledgers will be managed and which cases could require an administrator to have the right to amend them. Open APIs have the potential to radically shift the dynamics of how firms interact with customers

and with each other. The pace of preparation has been uneven, with some firms adapting their processes and operating models much faster than others.

Developing a roadmap

Whether a company prospers or flounders in the DLT-dominated markets of the future will depend, in large measure, on strategic decisions it makes today. The emerging leaders in this nascent technology take a systematic top-down and bottom-up approach to building a roadmap. They carefully tailor their focus based on who they are (e.g., bank, securities firm, asset manager or exchange), their size and position in the market, what kind of assets they handle, which clients they serve and the jurisdictions in which they do business.

As they develop a roadmap, firms evaluate potential scenarios for how different markets will evolve, in the context of each market’s current structure. Is the market consolidated or fragmented? How innovative and proactive is the regulator? Does the local exchange operate

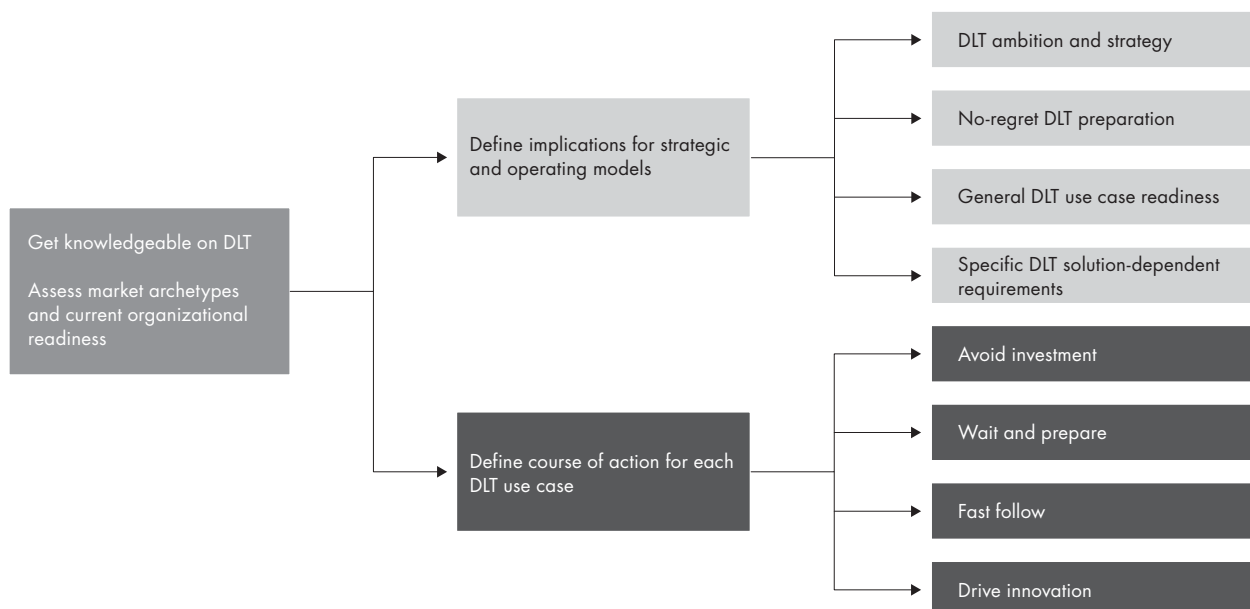
a vertically and horizontally integrated market infrastructure? Finally, the fundamental strategic questions need to include an assessment of DLT impacts on cost structure, weighed against the development of new products and enhancements of reference data.

Based on the answers to questions like these, firms can devise customized strategies for different locations, asset classes and activities. They can evaluate their options along a continuum, ranging from DLT investments that are internal or fairly independent to those that depend heavily on the cooperation of other participants in the ecosystem.

Firms have four basic strategic options regarding individual DLT use cases: become a leader in innovation; be a fast follower; watch, wait and prepare; or opt out altogether (*see Figure 5*).

Take the example of a bank operating in a smaller, integrated and centralized market, such as Australia or Brazil. The bank could decide to prioritize KYC use

Figure 5: Defining a fit-for-purpose DLT approach and roadmap



Source: Bain & Company

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cases, helping to form an industrywide utility, perhaps operated by a third-party provider. The bank could also be an early advocate for tokenization of syndicated loans, which would help bring more consistency, speed and liquidity to the market. Tokenization, which uses DLT to embed transaction and ownership information onto the asset, can increase efficiency and decrease costs. The firm could also prioritize application of DLT to OTC swap contracts that have a small set of counterparties.


In other areas of cash securities trading, clearing and settlement, the bank could choose to be a fast follower, ready to move as the positions of exchanges and regulators take shape. Some participants in these types of markets are already considering the idea of merging local custodians to form a joint-venture utility in advance of DLT disruption.

Taking a strategic approach to DLT

The data informing a firm's decision on where, when and how to use DLT across use cases should flow from the bottom up, but the process should be managed from the top down. Priorities need to be set strategically by top management and not left to percolate up from researchers in innovation labs. Once a firm comes up with a roadmap, it should define a DLT-readiness posture. Many of these priorities will be no-regret investments—namely, steps that stand to benefit the firm regardless of the pace or shape of DLT adoption. These no-regret moves include modernizing IT architecture; strengthening the framework for dealing with utilities, BPOs and other third parties; and evaluating outsourcing opportunities.

As a firm follows the roadmap it has created, it will need to monitor signposts and be prepared to shift speeds and make adjustments based on regulatory evolution, moves by competitors and shifts in technology. In an arena marked by uncertainty, proactive flexibility will be key.

Those market participants who win in DLT will spend less energy on excuses for inaction and more on developing a strategic and longer-term approach, focused on driving toward a more efficient ecosystem and plotting a course consistent with who they are, what they do and

where they operate. By taking a more strategic approach during the evolution of this new technology, they'll be able to tune out the hype and focus on defining their role in an evolving financial ecosystem. Those firms that are less systematic and more shortsighted are likely to see their businesses disrupted as they become less competitive. The winners will be those that push the pace of change, rather than resist it. 

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