Blockchain Unraveled: Determining Its Suitability for Your Organization

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Blockchain projects with pragmatic applications are generating business value unique to blockchain-enabling technologies. CIOs should use this research to understand when blockchain makes sense and the critical factors to consider to capture this new business value.

Opportunities and Challenges

- Blockchain projects provide value when multiple entities in an ecosystem require a shared, single version of the truth and no single entity is in control. This underlies relatively faster-moving blockchain projects, especially in utilities and wholesale trade for provenance and asset tracking.

- Blockchain projects often languish or die due to issues with ecosystem management and commitment, as well as lack of funding for immature technology. These issues are more prevalent in financial services and healthcare.

- Integrating blockchain and IoT enables business ecosystem stakeholders to generate new sources of revenue, cut costs, and improve customer experiences and trust. Conversely, this integration also introduces new risks and complexity to organizational systems.

- Blockchain technology has many components, but key technical innovations, such as tokens and decentralized anonymous consensus, are unusual in mature enterprise blockchain projects.

What You Need to Know

- Adoption of blockchain has been uneven across industries and regions, causing some organizations to miss out on a competitive advantage where they can prove and leverage increased trustworthiness and transparency into multiparty transactions.

- Blockchain projects in manufacturing, utilities and wholesale trade are moving relatively faster into production than others, shedding light on factors that drive project success. CIOs need to be aware of common mistakes that lead to project disappointment and failure.

- Joining consortia of organizations with similar use cases and business interests is the best way to derive value from blockchain. Groups organized by industry require attentive management and common goals to thrive.

- Learning which blockchain technology components are needed for your use case is essential for a successful deployment. CIOs need to plan upgrades to current-generation blockchain platforms because scalable platforms will only come in the next generation.

Insight From the Analyst

Blockchain's Time Is Now

Avivah Litan, Distinguished VP Analyst

Blockchain winter is upon us, but there are early signs it will begin thawing later this year. In the past year, disillusionment, stemming primarily from confusion about blockchain technology and what it can be used for, became the norm among CIOs and their colleagues.

Slowly and surely, practical use cases that demonstrate immediate business value for business ecosystems are moving out of pilot phases and into production. Successful projects support digital transformation that is not possible without blockchain, because it supports a single shared version of immutable truth among market participants that can be independently verified by each entity, with no single entity in control.

While legal agreements and frameworks are still required among ecosystem stakeholders, enterprise blockchain provides a much-needed boost to the trustworthiness and transparency of recorded transactions and business events.

Contrary to initial market hype and for the time being, blockchain is not enabling a major digital business revolution, and may not enable one until at least 2028 (see "The Future of Blockchain: 8 Scalability Hurdles to Enterprise Adoption"). Blockchain's key revolutionary innovation is that it eliminates **all** need for trust in any central or "permissioned" authority. But that is accomplished largely through decentralized public consensus, which is not yet used in enterprise blockchain, where organizations and consortia govern membership and participation. Still, enterprise blockchain is proving to be a key pillar in digital transformation that supports evolutionary and incremental improvements in trust and transparency across business ecosystems.

CIOs must now look past the hype and methodically consider blockchain adoption when and where it makes sense. The rise of digital business makes it crucial that you take the time to determine the best way your business can benefit from the technology, if at all. Our research will help guide your decision by:

1. Helping you assess the optimal and applicable blockchain technology for your use cases and laying out common mistakes that lead to project failure.

2. Outlining the factors, including geographies, sectors and use cases, that underlie current blockchain project success and failures, through a quantitative and qualitative analysis of live projects and case studies.

3. Providing guidance on how to best align your business and operations to support viable blockchain projects.

Adding blockchain to your business will add trust and transparency to transactions across your organization and your business ecosystems. In the digital business world, trust and transparency are the new gold standards that enable you to stay competitive in the next generation. It's time to get on board and take part in it.

Sincerely,

Avivah Litan

Executive Overview

Definition

> A blockchain is an expanding list of cryptographically signed, irrevocable transactional records shared by all participants in a network. Each record contains a time stamp and reference links to previous transactions. With this information, anyone with access rights can trace back a transactional event, at any point in its history, belonging to any participant. A blockchain is one architectural design of the broader concept of distributed ledgers.

It's time to get past the hype of blockchain technology and take the time to understand the types of use cases that can benefit from it, such as farm-to-table food tracking (see Figure 1), and how best to implement them. CIOs can use our decision trees, case studies, survey analysis and guidelines on critical success factors, consortia and operational alignment to make appropriate and worthwhile use of blockchain technology.

Figure 1. Farm to Table: IoT and Blockchain Integration

Farm to Table: IoT and Blockchain Integration

Source: Gartner
ID: 387734
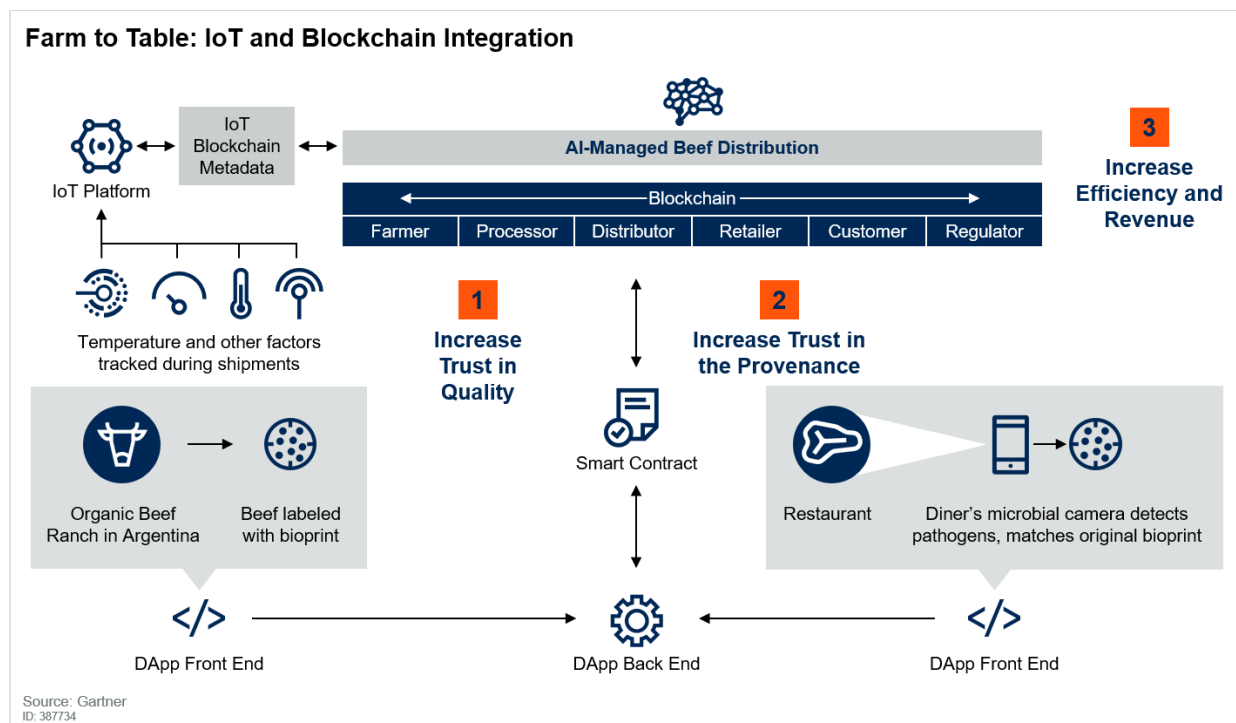
Research Highlights

Aligning Blockchain Technology to Your Use Case

Organizations primarily use blockchain DLT with their ecosystem partners for a shared, single version of the truth, based on immutable data and tamper-proof audit trails. This enhances and supports the efficiency, auditability and trustworthiness of existing multiparty business processes, where no one party is in control. (Blockchain project sponsorship should not be confused with project control; we often see one or two companies sponsoring a blockchain project and consortium, but that does not give them unique and unequal technical control).
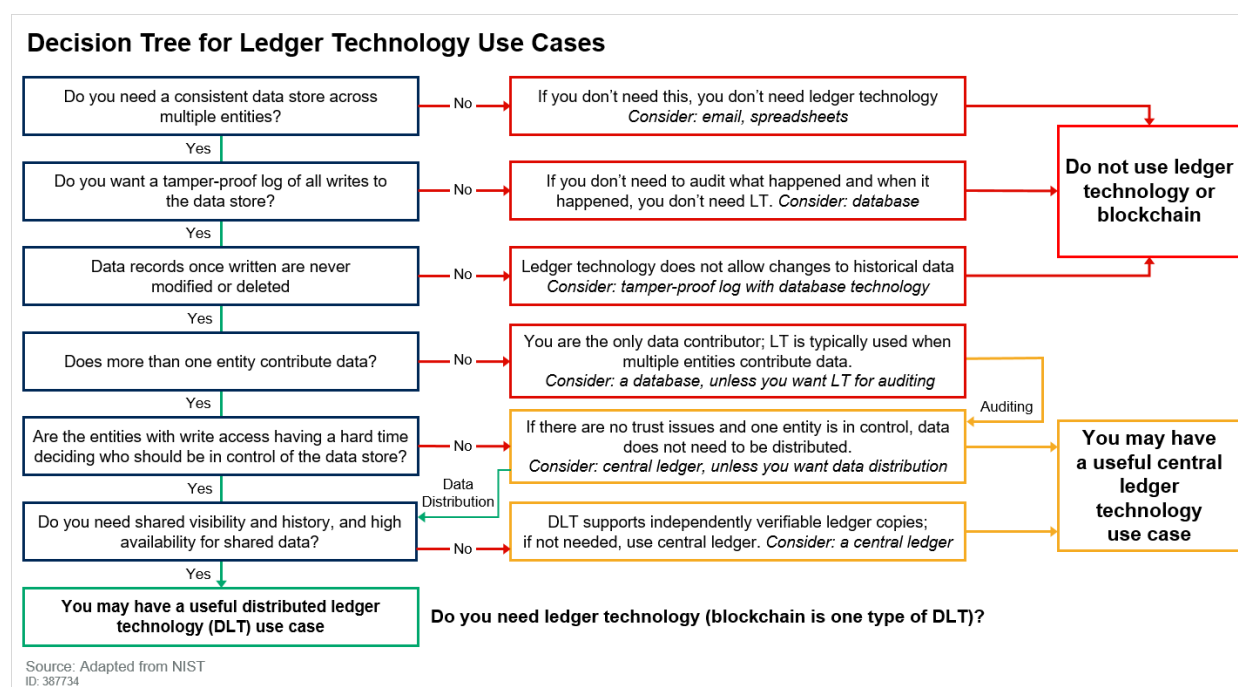
By 2028, when blockchain will be scalable, these companies will be well-positioned to introduce more disruptive use cases that leverage decentralized consensus (see "The Future of Blockchain: 8 Scalability Hurdles to Enterprise Adoption," which outlines the milestones and time frames for technical and operational scalability). By sharing data on the blockchain across business ecosystems, organizations will more readily move into the second phase of blockchain deployments, and benefit from the added security and trust assurance that comes from multiple witnesses to a transaction.

Aside from technology concerns, companies need to think through the external factors influencing their projects, including the legal and regulatory frameworks and implications, and the future viability of the blockchain ecosystems they participate in. As difficult as technology decisions are, the

nontechnical aspects of blockchain-based use cases can be more complex and should be addressed before evaluating any technology. It's the nontechnical factors, such as organizational and consortium commitment and agreed-upon processes and frameworks, that make or break a project. These factors are addressed in the Aligning Your Business and Operations to Blockchain section.

When it comes to determining if and when your organization has an appropriate use case, Gartner presents a decision tree to help CIOs determine which technology is best (see Figure 2). The decision tree below is the first of three sections that we have developed for CIOs as a guidepost.

Figure 2. Decision Tree for Ledger Technology Use Cases

Decision Tree for Ledger Technology Use Cases

- Do you need a consistent data store across multiple entities? — No → If you don't need this, you don't need ledger technology *Consider: email, spreadsheets*
- Yes ↓
- Do you want a tamper-proof log of all writes to the data store? — No → If you don't need to audit what happened and when it happened, you don't need LT. *Consider: database*
- Yes ↓
- Data records once written are never modified or deleted — No → Ledger technology does not allow changes to historical data *Consider: tamper-proof log with database technology*
- Yes ↓
- Does more than one entity contribute data? — No → You are the only data contributor; LT is typically used when multiple entities contribute data. *Consider: a database, unless you want LT for auditing* — Auditing →
- Yes ↓
- Are the entities with write access having a hard time deciding who should be in control of the data store? — No → If there are no trust issues and one entity is in control, data does not need to be distributed. *Consider: central ledger, unless you want data distribution*
- Yes ↓ | Data Distribution
- Do you need shared visibility and history, and high availability for shared data? — No → DLT supports independently verifiable ledger copies; if not needed, use central ledger. *Consider: a central ledger*
- Yes ↓
- **You may have a useful distributed ledger technology (DLT) use case**

Do not use ledger technology or blockchain

You may have a useful central ledger technology use case

Do you need ledger technology (blockchain is one type of DLT)?

Source: Adapted from NIST
ID: 387734

Related Research

"Assessing the Optimal Blockchain Technology for Your Use Case"

"Common Mistakes to Avoid in Enterprise Blockchain Projects"

Blockchain in Action Across Industries

Blockchain has been a hot topic for at least two years, but its use across industries and locations has been more limited and uneven than one might expect. CIOs can glean best practices and avoid the mistakes by studying use cases in their own and other industries.
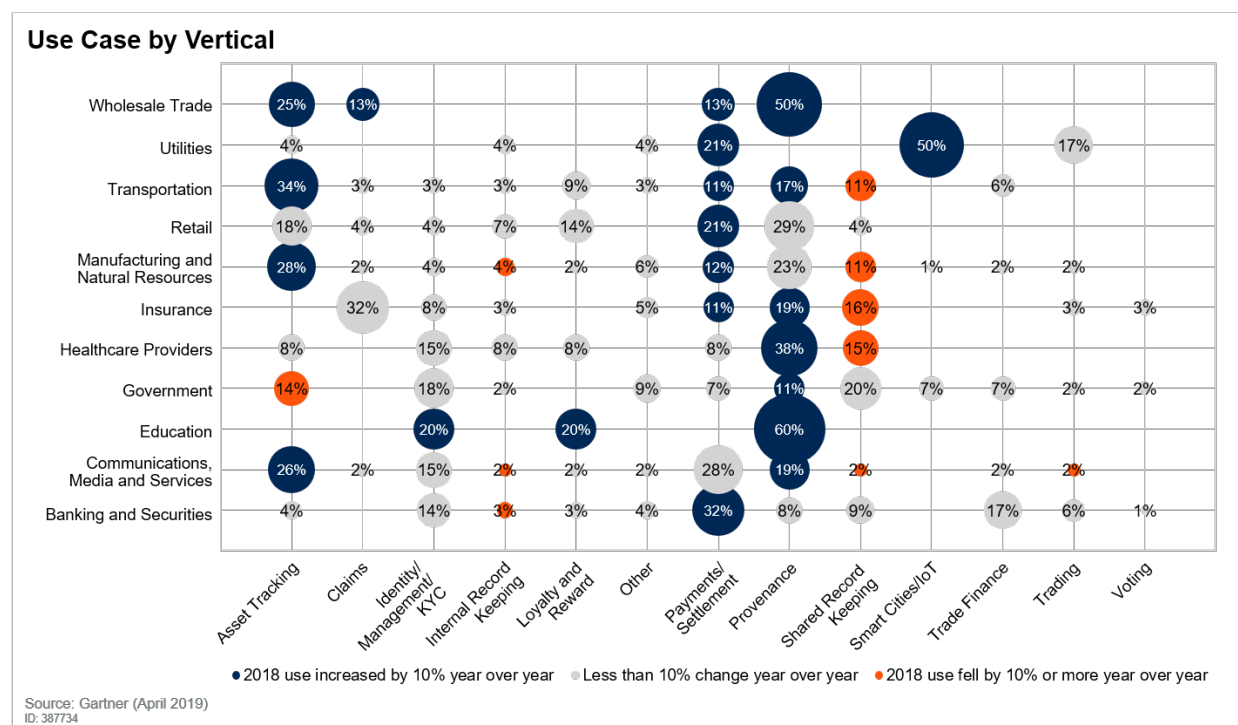
While payments and settlements are two of the largest areas in which blockchain is being trialed, less than 10% of such trials have made it into production. In the meantime, interest in other uses continues to grow. So, how should a CIO proceed?

Looking beyond the financial sector to understand how blockchain can be used to help your business is a good place to start. Sectors such as manufacturing, wholesale trade, utilities and government have moved projects into production much faster than financial services have (see Figure 3). Since these use cases do not require large initial ecosystems of competitors or the creation of new business models, and yet do resolve current pain points in business processes, they can be simpler to execute. While significant testing of blockchain is taking place in North America, projects are progressing faster in other markets, especially APAC. CIOs can find new ideas by examining such faster-moving markets.

The emergence of the Internet of Things (IoT) offers another opportunity to take advantage of blockchain to improve your business, especially for supply chains. Provenance and asset tracking use cases were on the rise in our recent research, particularly as they related to supply chain programs. Creating trust in physical things is greatly enhanced through blockchain and IoT network integration, generating value for all participants in the ecosystem by managing IoT data securely.

Our related research features analysis based on new primary research that examined over 800 projects and engagements carried out by over 50 consulting and services firms across the globe. We also provide research on the use of blockchain in various sectors, such as banking, government, education and communications.

Figure 3. Use Case by Vertical

Use Case by Vertical

Vertical	Asset Tracking	Claims	Identity/ Management/ KYC	Internal Record Keeping	Loyalty and Reward	Other	Payments/ Settlement	Provenance	Shared Record Keeping	Smart Cities/IoT	Trade Finance	Trading	Voting
Wholesale Trade	25%	13%					13%	50%					
Utilities	4%		4%		4%		21%			50%		17%	
Transportation	34%	3%	3%	3%	9%	3%	11%	17%	11%		6%		
Retail	18%	4%	4%	7%	14%		21%	29%	4%				
Manufacturing and Natural Resources	28%	2%	4%	4%	2%	6%	12%	23%	11%	1%	2%	2%	
Insurance		32%	8%	3%		5%	11%	19%	16%			3%	3%
Healthcare Providers	8%		15%	8%	8%		8%	38%	15%				
Government	14%		18%	2%		9%	7%	11%	20%	7%	7%	2%	2%
Education			20%		20%			60%					
Communications, Media and Services	26%	2%	15%	2%	2%	2%	28%	19%	2%		2%	2%	
Banking and Securities	4%		14%	3%	3%	4%	32%	8%	9%		17%	6%	1%

● 2018 use increased by 10% year over year   ● Less than 10% change year over year   ● 2018 use fell by 10% or more year over year

Related Research

"Blockchain Trials Show Pragmatism Emerging Across Industries"

"4 Types of Blockchain Business Use Cases That Investment Management CIOs Need to Track"

"Why Bank CIOs Should Care About New Blockchain-Based Cross-Border Payment Alternatives"

"Evaluate Promising and Maturing Blockchain Use Cases in Government"

"Integrating Blockchain With IoT Strengthens Trust in Multiparty Processes"

"4 Promising and Ambitious Blockchain Initiatives for Higher Education"

"How CSP CIOs Can Partner With Their Product Managers to Exploit Blockchain"

Aligning Your Business and Operations to Blockchain

CIOs often make the mistake of viewing blockchain as a new business model. The truth is that blockchain augments an existing business model. It represents technology that adds capabilities, including tokenization, distributed consensus and distributed ledgers, and enables CIOs to overcome specific business challenges.

A business model always begins with a value proposition for a customer. Because customers or constituents generally don't need or desire blockchain per se, but do need the outcomes that blockchain can support, blockchain is not a value proposition. Blockchain is best-positioned within the capabilities segment of a business model.

Blockchain adds little value unless it is part of a network that exchanges information. For this reason, CIOs are turning to consortia to derive the most value from blockchain. Choosing a consortium requires CIOs to perform due diligence before sharing data with an outside party. One option is to work with an industrywide consortium, but other types of consortium are also worth exploring.

CIOs must also ensure that IT operations is equipped and staffed to support the blockchain platforms that are adopted.

Figure 4. Types of Blockchain Consortia

Types of Blockchain Consortia

Advisory	Business	Platform
• Crowdsource • Research • Educational Materials • Standards • Work Groups • Advice	• Industry Players • Infrastructure Players • Business Solutions	• Technology Providers • Existing Platform • Ecosystem Development

Source: Gartner
ID: 387734
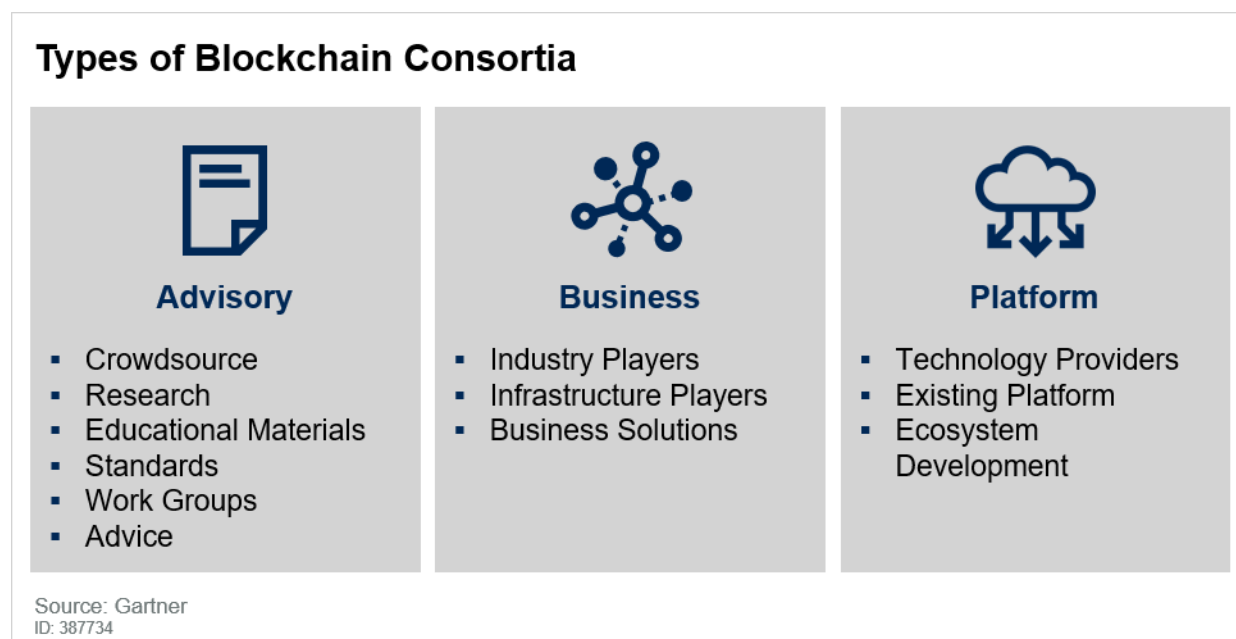
Related Research

"How Blockchain Will Affect Your Business Model"

"Innovation Insight for Blockchain Consortia"

"How to Operate and Support Blockchain Platforms"

Peer Perspective

Learn from your peers to help support decision making and leverage best practices.

These peer perspectives provide a complementary view alongside Gartner's expert research.

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Peer Connect

Peer Connect is a private community where Gartner clients can exchange insight and advice on their mission-critical priorities. Join the discussions occurring in these forums to ask questions and share insights on key initiatives.

"Peer Connect Perspectives: Learning About Blockchain Is the Right Thing to Do"

Peer Connect Forum

The Think Tank forum has discussions on nascent technologies such as blockchain.

Peer Insights

Gartner Peer Insights is a free peer review and ratings platform designed for enterprise software and services decision makers. Reviews go through a strict validation and moderation process in an effort to ensure they are authentic. Choose enterprise IT software and services with confidence. Read verified reviews from the IT community.

Reviews for Blockchain Platforms

Browse Markets

Write a Review

Join the Gartner Research Circle and help shape the future of the industry.

Key Initiatives for Continuous Insight

All your initiatives are important, but some are mission-critical.

Key initiatives organize the vast Gartner resources around the projects and programs at the top of your list, helping you to achieve demonstrable business results efficiently and cost-effectively. Key initiatives represent how we deliver ongoing insight throughout the year to help you tackle your top priorities. Be sure to track all key initiatives that relate to your top priorities.

"Blockchain Primer for 2019"

Related Priorities

Table 1. Related Priorities

Priority	Focus
Digital Disruption and Innovation	Digital disruption and innovation research focuses on how organizations can incorporate elements of willful disruption into business and technology strategies.
Technology Innovation	Enterprise architecture will increasingly provide the "strategic spear" organizations use to understand and implement their strategies as they explore and invest in digital business transformation.
Building and Expanding a Digital Business	The "building and expanding a digital business" initiative shows how to take digital business through the cycle, from strategy to development, to full-scale operation, to re-envisioning.

Source: Gartner

Gartner Analysts Supporting This Trend

Avivah Litan

David Groombridge

Chrissy Healey

Adrian Leow

Related Resources

Webinars

Get actionable advice in 60 minutes from the world's most respected experts. Keep pace with the latest issues that impact your business.

- Selecting Blockchain Technology for Your Use Case

- Applying Blockchain Across Industries: Gartner Answers Peer Questions

- Overcome 8 Hurdles to Blockchain Scalability and Adoption

- Make Blockchain Work for Your Organization

Conferences

Discover the future of blockchain at one of our many Gartner conferences across the globe.

- Gartner CFO & Finance Executive Conference 2019

- Gartner Enterprise Architecture & Technology Innovation Summit 2019

- Attend one of our many Gartner IT Symposium/Xpo Strategies Conferences around the globe: Explore the strategic trends and technologies that are shaping the future of IT and business at IT Symposium/Xpo 2019.

Articles

- The 4 Phases of the Gartner Blockchain Spectrum

- The Reality of Blockchain

- Assess Blockchain for GDPR Compliance

- The CIO's Guide to Blockchain

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