

Innovating with Blockchain

Abstract

Ever since bitcoin gained prominence, blockchain technology has captured the attention of media, investors, organizations, and startups. However, the technology has far more potential than the hype surrounding some of its early applications. Blockchain has the potential to transform industry structures and drive large-scale shifts in the business model of organizations. To realize this potential and overcome the challenges in adoption, it is essential to take a strategic approach, instead of a piece-meal one.

Blockchain: The hype and the promise

Blockchain gained prominence during the recent hype about crypto currencies and initial currency offerings (ICO) that gave a new impetus to fund raising. Even though the crypto currencies and ICOs belied their promise, blockchain's potential to transform transactions got reaffirmed.

Experts and analysts agree that blockchain—a distributed, peer-to-peer, digital general ledger—will have a transformative impact on both the economy and the society. Blockchain enables:

- **Reliable execution of business rules across parties:** Today, enforcing business rules across parties requires regulations, processes, and human support. Smart contracts, a key component of blockchain technology, can ease the enforcement of business rules by ensuring the execution of the rules across parties independently.
- **Disintermediate third parties:** Intermediaries play a prominent role in centralized organizations to facilitate transactions and business processes involving multiple parties. Blockchain can replace intermediaries with a protocol that provides similar functions, but cannot be controlled by any one stakeholder.
- **Automate trust:** Organizations invest significant resources to ensure trust in transactions. Blockchain provides a software protocol that ensures all parties view the same data, perform the same processing, and get the same results, thereby automating trust.

The **internet of information** has transformed industries including communication, retail, transportation, and banking. It has also reshaped supply chains across sectors. Blockchain with its ability to enforce business rules, remove intermediaries, and automate trust, is poised to enable the **internet of value**. As blockchain technology gains momentum, there is little doubt that it will bring about change on a similar scale as the internet.

Blockchain and the enterprise

Innovations brought about by blockchain technology can be divided into three broad categories.

- **Efficiency:** Innovations that improve productivity to deliver significant cost savings
- **Transformation:** Innovations that lead to a quantum jump in customer experiences, market share expansion, and launch of products and services abandonment.
- **Disruptive:** Innovations that result in new business models, revenue streams, and change the competition landscape. These have the potential to drive infinite value creation

As organizations adopt these innovations and adapt to the associated changes, they will create new business models. Blockchain can enable multiple business models, depending on the relationships among the stakeholders. Broadly, they can be categorized into five models (see Figure 1)

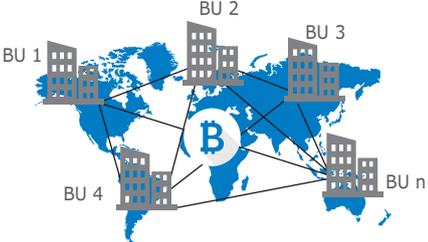
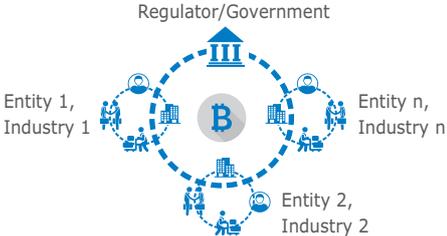
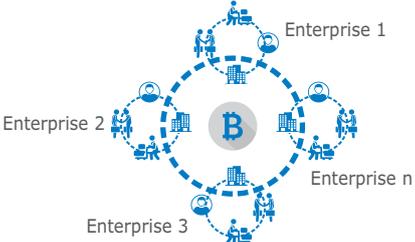
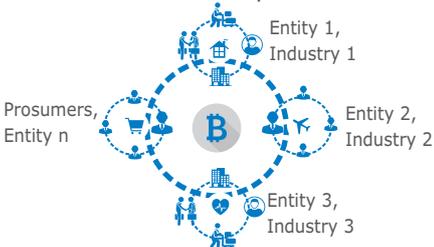
Blockchain model	Use cases	Benefits
<p>1 Intra-organization</p> 	<ul style="list-style-type: none"> ■ Shared data repositories ■ Corporate actions ■ Audit trail 	<ul style="list-style-type: none"> ■ Efficiency ■ Productivity
<p>2 Existing ecosystem</p> 	<ul style="list-style-type: none"> ■ Pharma cold chain ■ Cargo tracking ■ Flight delay insurance ■ Working capital 	<ul style="list-style-type: none"> ■ Efficiency ■ Enhanced customer service
<p>3 Central authority-led ecosystem</p> 	<ul style="list-style-type: none"> ■ Land records management ■ Mortgage servicing rights transfer ■ Lost passport certificate ■ Utility service provider switching 	<ul style="list-style-type: none"> ■ Shared transparency ■ Compliance
<p>4 Ecosystem among industry peers</p> 	<ul style="list-style-type: none"> ■ KYC ■ Capacity optimization ■ OTC derivatives 	<ul style="list-style-type: none"> ■ Curated network ■ Shared need and purpose
<p>5 Cross-industry ecosystems around nested experiences</p> 	<ul style="list-style-type: none"> ■ Electric vehicle charging ■ Tokenized multi-partner loyalty platform 	<ul style="list-style-type: none"> ■ Curated nested experiences for consumers/businesses

Figure 1: Five blockchain-enabled business models and their use cases

- 1. Intra-organization:** Applicable to business entities in a large group or conglomerate. For example, multinational banking entity [BNP Paribas](#) created an innovative blockchain-based platform to provide fast, accurate, and secure corporate event announcements to clients around the world.
- 2. Existing customer, supplier, and partner ecosystem:** Providing a blockchain link among stakeholders. A large travel commerce platform enabled end-customers to acquire and trade their travel assets through an interoperable blockchain platform.
- 3. Central authority-led ecosystem:** Mediated or regulated ecosystems such as depository, central bank, and governments that bring various entities together. [Canadian Depository for Securities](#), a subsidiary of TMX, designed a non-exchange trade settlement process that helped complete delivery versus payment (DVP) trade settlement using tokenized assets held on a Quartz blockchain ledger.
- 4. Ecosystem of industry peers:** Intra-industry ecosystems coming together for 'coopetition' with a shared objective. For example, bank and financial institutions coming together for cross-border settlements or corporate action. [Central Securities Clearing System \(CSCS\)](#), the Central Securities Depository (CSD) of Nigeria, and Standard Bank of South Africa used Quartz blockchain technology to set up a cross-border corporate action information exchange, setting the stage for an innovative pan-African financial ecosystem for cross-border transaction settlement.
- 5. Multi-entity ecosystem around nested experiences:** Various service and product providers coming together to create integrated customer experiences. For example automotive equipment makers, utilities, retailers, hospitality, and payment providers coming together to build an ubiquitous electric vehicles (EV) charging infrastructure, powered by blockchain and AI personalization engines, to alleviate range anxiety, and pave way for rapid adoption of EVs. In India, under One TATA, TATA group companies have already started on this journey.

Realizing the value of blockchain

Blockchain is an important technology that can deliver value to all stakeholders in the society and the economy. However, organizations need to navigate a unique set of challenges

owing to the characteristics of the technology and the broader trend of digitization.

First, ecosystems are essential to realize value at scale. To run an ecosystem on a large scale, a collective group of organizations needs to align the business models and incentive structures of participants. Companies should contribute adequate effort to create a robust design for the ecosystem with the appropriate incentive structures to ensure alignment with the goals of the ecosystem.

Related to this challenge is the organizational mindset centered on existing business models that hampers innovation efforts. A key shift with blockchain is the need to move from a centralized model that vests control with a few entities to a decentralized model that distributes control amongst a wider set of stakeholders.

Second, blockchain is not the only systemically important technology that organizations must address today. Large-scale innovations are possible with technologies such as artificial intelligence and the internet of things. The convergence of such technologies will open up a multitude of innovation possibilities creating choices with varying degrees of risk and uncertainty.

To address these challenges, organizations must take a comprehensive strategic approach to deploy blockchain innovations that includes a rigorous process to identify the most promising innovation opportunities, willingness to change business models and processes that facilitate participation in ecosystems. The approach must have complete support of the leadership of the organization and be driven by metrics that enable a journey of discovery.

Conclusion

Today, many organizations seem to be approaching blockchain in a piece-meal fashion without adequately accounting for its impact on their business model and the associated change requirements. Such an approach is unlikely to be fruitful given the general purpose applications of blockchain. It is important to assess the impact of blockchain application on the organization, select the most suitable business model, and address the challenges of adoption accordingly.

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