

Riding the Blockchain Wave for High Tech

Abstract

Given the disruptive power of blockchain, a growing number of high tech companies are deploying proofs of concept across different enterprise scenarios. If your enterprise is looking to cash in on this technology, it is important to first determine the merits of each use case and understand the key challenges and solutions available. As the blockchain revolution gains momentum, we discuss the possibilities for the high tech industry through six use cases.

Deployment of Blockchain: Non-financial Applications are Gaining Traction

According to the World Economic Forum, 10% of the world's GDP might be stored on blockchain by 2027.¹ Although the digital currency bitcoin was developed to disrupt the financial sector, its underlying blockchain technology is now being adopted for a number of non-financial scenarios. The distributed ledger technology ensures accountability, immutability, auditability, and integrity of data, making it ideal for developing such use cases.

In the high tech industry, blockchain is relevant for many applications, like supply chain, loyalty and reward programs, digital rights management, audit trail compliance, digital identity, and HR background checks. However, enterprise blockchain is still maturing, and there have been no large-scale production level deployments so far. To succeed with enterprise blockchain, organizations require a holistic, well thought out approach. The path to selecting the right architectures and technologies is likely to involve a series of trials, errors, and innovations.

Assessing the Applicability of Enterprise Blockchain

Before embarking on blockchain initiatives, organizations must first establish whether their use cases merit the use of blockchain. But what criteria should high tech companies use to decide this?

Organizations can use blockchain in cases where trust is difficult to establish between parties in a transaction value chain. Transaction value chains involving multiple parties across different regions and varied systems of reconciliation, or those that require immutability and transparency into each change of state are ripe for blockchain disruption. Blockchain is also ideal if organizations need to significantly reduce the settlement time between involved parties, as it helps eliminate intermediate checks.

To meet enterprise requirements, blockchain solutions must address high-level concerns related to architectural and implementation challenges, and ensure scalability, security, and interoperability. Some of the key factors to be considered for a successful implementation include:

- 1) Only private or permissioned blockchain may work in an enterprise setting
- 2) Open source technologies might be preferable
- 3) Blockchain solutions should ideally:
 - a. Have no native currency such as bitcoin or ether
 - b. Support public key infrastructure-based identity management and selective disclosures for audit
 - c. Ensure privacy and confidentiality through digital certificates and encryption
 - d. Ensure smart contracts are pluggable to enable easy deployment on other blockchain platforms
 - e. Deploy an efficient and secure, role-based consensus algorithm that is adaptable to evolving business rules

Compelling Use Cases for the High Tech Industry

Let's look at some blockchain use cases across high tech industry segments such as computer platforms, technology services providers, electronics, and professional services providers.

Supply chain: Blockchain when coupled with IoT can dramatically transform today's supply chain programs. It introduces provenance to the supply chain while increasing the levels of transparency and visibility. OEMs can use blockchain to detect spare parts counterfeiting, as well as eliminate or reduce reconciliation step. It can also allow customers to trace products from source to outlet for environmental or fair-trade concerns.

Audit trails: If enterprises standardize certain aspects of accounting on a private blockchain, auditors can automatically verify the important data behind the financial transaction. A consensus algorithm can streamline the manual and time-consuming processes of financial statement reconciliation and attestation. Blockchain opens up the possibility of real-time auditing to save effort and time, helping to move away from the traditional sampling and interviewing process used for data verification. This can help build trust with shareholders, regulators, and customers.

Customer loyalty and employee rewards: With blockchain, businesses can reimagine the technology underpinning loyalty programs to increase efficiency and engagement. Loyalty providers can control how and with whom customers use rewards, while providing customers a frictionless experience in accessing and managing benefits across program partners and vendors. Similarly, blockchain can also be leveraged to build an effective employee reward platform.

Digital rights management (DRM): Blockchain can help content creators establish information such as who the creator is, while sharing it immutably. It establishes ownership and makes the rights to a particular piece of content clear to everyone in the network. With a blockchain-based DRM solution, users will be required to establish their digital identity before they can open a piece of digital content on any device. For digital assets, the revenue can be directly credited to owners, based on asset usage policy.

KYC and AML: Professional services firms together with financial institutions can use digital ledgers to ensure that the clients they work with are not supporting money-laundering activities. However, it is also essential that in designing such a solution, the participating entities have access to only the data that they require.

Human resources: To authenticate employment and education records, recruiters, educational institutes, and government agencies can use blockchain solutions. This will in turn increase hiring efficiency and result in the recruitment of candidates with genuine credentials.

Overcoming the Challenges in Blockchain Implementation

Since blockchain was primarily developed for crypto currencies, its adaptation for other industries is emerging slowly. Following are some of the issues that will need to be addressed for successful deployments:

- a. **Scalability:** Bitcoin processes seven transactions per second as its protocol restricts the block size to 1MB. However, the storage and computing power requirements for a centralized blockchain with full nodes operationalized in a network can be very high. Organizations can therefore use pruning and efficient consensus protocols or they can limit the data stored on the blockchain to just the essential data sets. For private blockchains, scalability might not be a major challenge as only a limited set of nodes run the transactions.
- b. **Smart contracts:** In case of an erroneous text entry, the negative impact can be more damaging than a traditional contract as smart contracts only interpret the literal meaning in the code, not the underlying intent. Enterprises entering into smart contracts should therefore ensure that the code is optimized at the input stage. They also need to be looked at from a regulatory and legal standpoint.
- c. **ERP systems integration:** An enterprise scenario will require good integration with ERP, CRM, and other systems. Standard, two-way data exchange between blockchain and existing enterprise systems will help expedite industry adoption.
- d. **Proven reference architectures:** Reference architectures need to be created for blockchain integration with the latest technologies across the business and front-end layers, since the underlying technology is still bare metal. As integrations are built with Big Data, IoT, and machine learning systems, reference architectures will mature. Domain specific designs, leveraging Ethereum or Hyperledger stacks, are expected to be adopted (for instance R3 Corda for financial services).

- e. **Lack of pre-defined governance:** In the absence of established rules or legal frameworks today, resolution of blockchain centric disputes is a challenge. With regulators working closely with the industry, universally accepted regulations are expected to be introduced for blockchain soon.
- f. **Absence of tools and knowledge repositories:** There are limited tools and knowledge repositories for blockchain implementation. Given its high potential and the growing number of investments in blockchain technology, faster evolution is expected with respect to integrated development environments. There are more than 70 platforms and another dozen expected shortly.² Smart contract languages such as Go and Solidity are quickly evolving.
- g. **Privacy:** Existing blockchains are designed to be anonymous. However, in business, controls and permissions are required, and organizations cannot deal with anonymous partners. Zero Knowledge Proof (ZKP), cryptographic, and segmentation based encryptions will have to be used to enhance privacy.
- h. **Lack of standards and interoperability:** Blockchain lacks globally approved standards and the path to ISO standardization is long. Open process standards on the other hand, might lack credibility. Interoperability is another issue. Leaders of various blockchain and distributed ledger projects have only recently started working collectively on what could become an interoperable network of services.

Join the Blockchain Revolution

Blockchain technologies offer a radical departure from the current transaction and recordkeeping mechanisms and can serve as a foundation of disruptive digital businesses for both established enterprises and startups.³ However, it will take some time for the technology to fully mature for large-scale enterprise level deployments. Within the next year, we expect blockchain technology to transcend the hype stage and become deployable across a host of real-world scenarios.

Many high tech and professional services companies have embarked on the journey to exploring distributed ledger technologies. While there is a lot of excitement around blockchain, its success hinges on the formation of consortiums or interactive networks that can help build new standards for its application and management. The role of system integrators in establishing interoperability, customizing platforms, and accelerating use case development cannot be over-emphasized. For companies looking to maintain an edge, now is the best time to invest in and leverage the disruptive power of blockchain.

References

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