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Emerging Tech: Top Blockchain Use Cases Delivering Real Business Value

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Initiatives: Emerging Technologies and Trends Impact on Products and Services

Select blockchain applications — such as track-and-trace and data marketplaces — will survive the blockchain "winter" due to their purpose-built nature and quantified business outcomes. Product leaders must focus on use cases that solve real-world business problems and deliver business results.

Overview

Key Findings

- Blockchain improves operational efficiency and reduces inventory loss in the supply chain by tracking the exchange of payments, goods and information across borders, with future adoption driven by environmental sustainability initiatives and regulations.
- Blockchain technology facilitates the monetization and secure sharing of sensitive data within organizations in a trustless network through the creation of data exchange marketplaces.

Recommendations

Product leaders investing in emerging technologies to build enterprise blockchain solutions should:

- Meet emerging demand for track-and-trace offerings by building packaged supply chain solutions for key industries (such as transportation, manufacturing and healthcare) that will be impacted by upcoming regulations.
- Create data exchange marketplaces by identifying industries plagued with data-sharing problems and positioning your blockchain-based solution as a business solution offering new revenue streams and cost savings as primary value outcomes.

Technology Description

Blockchain is an expanding list of cryptographically signed, irrevocable blocks of records shared by all participants in a peer-to-peer (P2P) network. Each block is time-stamped and references links to previous data blocks. Anyone with access rights can trace a state change in data or an event belonging to any participant.

Blockchain as a shared trust infrastructure enables organizations to run a business function as a protocol among the ecosystem participants. This is done by deploying smart contracts that define and manage appropriate tokens (assets) relevant to these business functions.

Smart contracts are typically objects with states and codes that are immutably stored and autonomously run on a blockchain that responds to triggering transactions. Each object defines a set of state variables and related methods to establish the business logic and rules that must be followed before changing the object state.

Sample Vendors: BlockApps, Circulor, Chainalysis, Enjin, Ethereum, FarmaTrust, Fireblocks, Kaleido, Nori, ProCredEx, Quantstamp

Use-Case Adoption Trends

The ability to demonstrate value outcomes in blockchain-based use cases is a challenge most blockchain providers face. Over the past two years, many projects have failed, and customers and partners alike have lost faith in blockchain technology. This is because many blockchain projects did not require blockchain technology.

This document highlights three use-case areas where blockchain technology is solving key business problems and delivering value outcomes. These examples demonstrate that, if applied correctly, blockchain technology can be greatly beneficial.

Primary CBR Findings

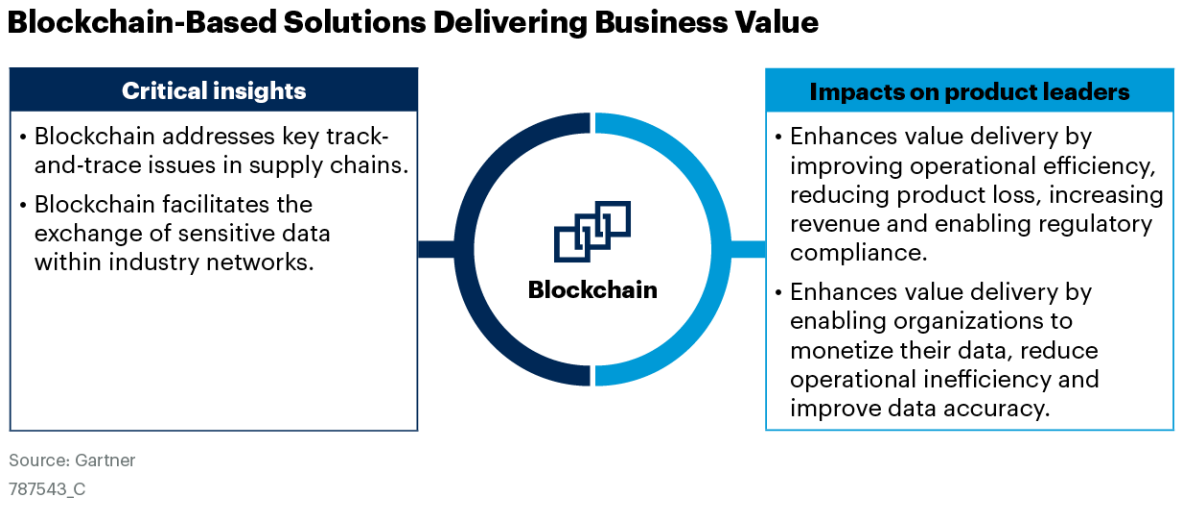
Based on Gartner's Case-Based Research (CBR), blockchain solutions are delivering business value (see Figure 1) in:

1. Supply chain tracking and tracing

2. Data exchange marketplaces

This document will explore these applications, the value they deliver and their growth potential.

Figure 1: Blockchain-Based Solutions Delivering Business Value



Use Case Insight: Blockchain Technology Solves Supply Chain Operational Challenges

Blockchain technology helps solve key supply chain problems. Supply chains are characterized by a lack of trust and data sharing, which not only creates operational inefficiencies (such as time and product waste), but also results in product and revenue loss. There is also a lack of end-to-end visibility throughout the supply chain, inhibiting transparency and compliance.

Blockchain technology is uniquely positioned to address these operational challenges by providing:

- Data immutability for the sharing of verified data among stakeholders and for regulatory compliance
- Encryption for secure data sharing in a trustless network
- A ledger for tracking assets and transactions end to end
- A system for record for automatic data processing to replace inconsistent, manual processes
- A distributed system for verifying transactions and activities without the need for a centralized authority

Essentially, blockchain-based solutions can be used to track the exchange of payments, goods and information across borders.

Use Case Example

The World Federation of Hemophilia (WFH) is an NGO that has partnered with two global pharmaceutical companies to donate medicines to developing countries. In May 2021, WFH partnered with the British Standards Institution and Trace Labs to pilot a track-and-trace blockchain solution in India to address concerns around product diversion and subsequent product loss in the supply chain. This was due to gaps in stakeholder quality management competencies, a lack of insight into product stock and storage levels, and inconsistent, manual processes in product documentation.

The implementation used Trace Labs' AidTrust data management solution powered by OriginTrail's Decentralized Knowledge Graph. Donated products are equipped with QR codes, which are scanned at the distribution center and at the receiving hospital. This supply chain transparency helps partners by:

- Enabling products to be authenticated as real (and not counterfeit) at receiving hospitals
- Providing visibility on medicine stock levels by tracking patient utilization
- Pinpointing diversion or waste issues (such as expired products) using the immutable product data stored on the blockchain

WFH's initial deployment of the AidTrust solution started at a single distribution center before expanding to 90 distribution centers across the country. AidTrust tracked 4 million medical units and reduced product loss in the supply chain by 100%. This solution remains in production as a pilot project.

Other examples of blockchain-enabled track-and-trace offerings include:

- BlockApps, in collaboration with Bayer Crop Science, launched the TraceHarvest Network, which tracks seeds from initial agriculture input (i.e., seed collected) to distribution (i.e., sold at a co-op) to product processing as a sellable good. This transparency reduced food waste by preventing recalls, demonstrating compliance with sustainable agriculture practices, and improving inventory management by tracking the purchase, use and distribution of seeds. [1]

- Polestar, a Swedish car manufacturer, is using Circulor's blockchain technology to track the carbon dioxide emissions of a car's component parts (such as the mica and cobalt used in the battery) from the mine to the production line. This provides needed supply chain visibility as the company works to create a climate-neutral car. [2]

- SAP's GreenToken and blockchain system was used in a proof of concept (POC) by seven organizations (including Berry Global, Elantas, SKGC, Unilever and Westlake Vinnolit) to track bio-circular feedstock (i.e., material waste) throughout the supply chain for sustainability reporting and mass balance accounting. [3]

- SABIC, a chemical manufacturer, used Finboot's MARCO track-and-trace solution to track plastic waste and chemical recycling from intake to production. This is improving feedstock management and reducing the administrative work for material certification by providing better data, and it is supporting environmental, social and governance (ESG) credentials by providing verification of sustainability proof points. [4]

Near-Term Implications for Product Leaders

Supply chain traceability is a blockchain application that remains relevant, despite the noticeable cooling of the blockchain market. This is due to the technology's ability to address key supply-chain problems as well as generate business value. Track-and-trace applications are found not only in pharma, but also in manufacturing, recycling, secondary resell markets, and global shipping, where a lack of data immutability and asset visibility creates operational inefficiencies that generate costs for an organization. Regulations on product traceability and carbon emissions (particularly in Europe) are expected to drive the adoption of blockchain-based track-and-trace solutions for regulatory compliance. Blockchain's inherent attributes ensure the credibility of data, foster trust among participants, and promote accountability and traceability in systems where these characteristics are crucial.

The use of blockchain to create and prove the operation of sustainable supply chains is an emerging trend directly linked to regional regulatory drivers and green consumerism. Here, blockchain is being used to:

- Prove "green" supply chain practices (both upstream and downstream) to government regulators

- Enable differentiation and "green" marketing

- Ensure current and future regulatory compliance
- Provide product transparency to customers (for example, by providing a QR code that shows what types of recycled materials were used in the manufacturing of a purchased product)

Despite the opportunity track-and-trace applications present, there are several adoption challenges, such as a lack of budget for or interest in blockchain projects due to the prioritization of AI-focused projects, such as generative AI applications. It is also worth noting the technological complexity of a track-and-trace implementation, as well as the partner buy-in up and down the supply chain required for effective implementation. The network effect is simultaneously a benefit multiplier and an adoption inhibitor for supply chain offerings. (See Emerging Tech: Network Effect Is Critical to Blockchain Solution Success for more details.)

Recommended Actions for the Next Six to 18 Months

- Drive adoption and build partner buy-in throughout the supply chain by illustrating the cost savings, revenue growth and operational efficiencies enabled by your blockchain offerings through referable case studies.
- Market your product as enabling regulatory compliance by developing packaged track-and-trace offerings for environmental sustainability in key industries, such as transportation, manufacturing and retail.

Use Case Insight: Blockchain Enables the Creation of Data Exchange Marketplaces

Facilitating information between organizations in a trustless ecosystem is a prime application for blockchain technology. The drive for the exchange of information between organizations within a network is inhibited by a lack of trust, associated data security and privacy concerns, and information validation. Blockchain technology is in a unique position to solve for this problem by providing:

- Distributed ledgers for data privacy that validate information against the blockchain instead of revealing personally identifiable information
- Decentralized peer-to-peer networks where multiple parties validate that shared information is correct
- Data immutability for trusted information exchange

- Encrypted and tamper-proof data for information security

These technology features enable sensitive data to be safely and securely exchanged between organizations and support the creation of data exchange marketplaces. The use of a blockchain-based data marketplace solution:

- Reduces costs and time waste by eliminating the intermediaries facilitating data exchanges
- Monetizes the benefits of exchanging data in a marketplace
- Maintains an organization's ownership of the information shared within any given network
- Ensures data quality and integrity by validating it against the blockchain

Blockchain-based solutions are being deployed to handle sensitive data like patient/medical information, certificates, legal documents and contracts. They are particularly relevant in industries such as healthcare, real estate and insurance, where there is a necessity for trustless parties to share private or confidential information.

Use Case Example

In 2018, Synaptic Health Alliance (a healthcare insurance consortium) partnered with Kaleido (a blockchain and digital asset platform) to create a data marketplace. The purpose of this marketplace was to maintain accurate healthcare provider directories that include information such as physicians' names, specialties and contact information. Healthcare insurance providers are legally required to provide and maintain these directories for patients. Prior to using blockchain, insurance providers maintained their own separate provider directories, which were costly, time-consuming and often consisted of out-of-date information.

Synaptic used Kaleido's blockchain platform and distributed ledger to create a formal mechanism for data management and exchange. Information is sourced from healthcare providers and verified via the blockchain consensus mechanism by other members on the chain. Tokens are used to incentivize members to share accurate data and penalize members for sharing bad information. Tokens are used to buy access to member data. With a data exchange platform in place, patients can obtain accurate information through their existing health insurance provider's website. The resulting platform allowed providers to monetize their data after verification and has created an ecosystem where each provider can securely share and exchange their credentials. [5]

By using the data exchange marketplace, Synaptic members are able to: [6]

- Find and update up to 88% of necessary data faster in the data marketplace than they could have on their own.
- Reduce outreach calls to providers for data updates by up to 25%.
- Ensure high-quality data, with members agreeing on 97% of entries via the consensus mechanism.
- Increase ROI by reducing resources committed to data update and management and duplicative administrative costs.

By reducing the administrative costs of data update and management, some members have seen an ROI. For example, one of the Synaptic members, MultiPlan, experienced a 500% annual ROI from its participation in the data exchange marketplace. [7]

Other examples of blockchain-enabled data exchanges include:

- RiskStream, a consortium of around 30 insurance providers, used Kaleido to build an insurance-specific enterprise blockchain platform called Canopy. RAPID X is a decentralized application that runs on Canopy and enables the immediate, secure and direct exchange of insurance information between providers. RAPID X helps save time on claims processing, carrier information exchange and liability determination, as well as reduce data errors. [8]
- Honeywell used SmartAxiom's blockchain technology to create GoDirect Trade, a marketplace for the reputable resale of aircraft parts. [9]

Near-Term Implications for Product Leaders

Blockchain technology can replace third-party intermediaries in current data exchanges by creating data marketplaces that enable trustless parties to securely share sensitive data. This not only eliminates the cost of intermediaries, but also creates a way for organizations to monetize the exchange of their data.

Despite the clear ROI, data exchange marketplaces face adoption challenges due to the technical complexity and broad business buy-in required within any given network for the data marketplace to actually work. A marketplace is only as good as the number of participating organizations.

Product leaders should focus on reducing adoption barriers, like reluctance to replace existing systems, required expertise, skepticism of business value in the offering of their use case, and technology and competitive concerns. This can be achieved by creating blockchain solutions that plug into existing ERP and CRM systems, starting with a small-scale POC to demonstrate project viability, offering bundled pricing discounts for downstream users and underscoring the decentralized nature of the blockchain solution.(See Emerging Tech: Network Effect Is Critical to Blockchain Solution Success for more details.)

Recommended Actions for the Next Six to 18 Months

- Target prospective customers by identifying consortia where data exchanges are costly and required (such as in the transportation, healthcare and manufacturing industries) and starting with a small-scale, low-cost POC to prove out the offering and generate network buy-in.
- Improve the scalability and repeatability of your blockchain offering by focusing on one to two industries to build vertical expertise and industry trust.

Analysis

Evidence

These findings were derived from Gartner's Blockchain Case-Based Research, which examined the offerings and use cases of more than 30 companies (and other entities) involved in building or using tokenization technologies and associated use cases. This research was conducted from October 2022 to February 2023.

[1] Bayer Crop Science and BlockApps launch TraceHarvest Network, Future Farming.

[2] Polestar 2 Receives Sustainability, Tech and Design Updates, Polestar.

[3] The Power of Tokenization, SAP.

[4] SABIC Case Study, Finboot.

[5] Proving Blockchain's Value in Healthcare, Synaptic Health Alliance.

[6] Why We Came Together, Synaptic Health Alliance.

[7] Blockchain Could Save Healthcare Billions Every Year, Healthcare IT Today.

[8] RAPID X: A First Notice of Loss (FNOL) Data Sharing Solution, The Institutes RiskStream Collaborative.

[9] Honeywell Uses Blockchain To Digitize Aircraft Records, Parts Pedigree Data, Honeywell.

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