

Market Landscape: Blockchain for Telecoms

Emerging blockchain solutions and use cases for the telecoms industry

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Introduction

▪ Catalyst

- Blockchain has been coined as the “technology that brings trust where there is none” and while the technology has found its way into other industries, interest within the telecoms industry is just beginning to be piqued. It is clear from the complex nature of blockchain and distributed ledger technology, that in order for it to find success in the telecoms industry, vendors will need to bring together blockchain technology and telecoms industry expertise. Several vendors have already launched telco-grade blockchain solutions, with many use cases aimed at improving internal operations and processes specifically for communications service providers (CSPs). This report examines the state of the blockchain market landscape with a focus on the vendors with telco-grade blockchain solutions and use cases.

▪ Ovum view

- The blockchain vendor landscape continues to grow as companies hope to capitalize on enterprise interest in the technology. Many of these solutions, however, are not fit to meet the stringent requirements of the telecoms industry. The telecoms blockchain market remains in the very nascent stages, with only a handful of vendors having launched telco-grade blockchain solutions. Although there have been discussions and even a proof of concept around implementing blockchain to improve partner transactions such as interconnect settlement, much of blockchain’s value will lie in the technology’s ability to transform CSPs’ internal operations and process. While Ovum anticipates that more vendors will enter this space in the future, we also expect CSP adoption of blockchain to be minimal over the next three years as more practical concerns such as regulation, industry standards, and solution maturity, are worked out.



Introduction

▪ Key messages

- Interest in blockchain has begun to pick up steam in the telecoms industry, with 55% of CSPs planning to trial or deploy the technology in 2019, according to Ovum's ICT Enterprise Insight survey.
- Telecoms-focused consortia and tier-1 CSPs have been among the early adopters of and participants in blockchain proofs of concept (POCs) and deployments.
- Although vendor blockchain solutions aimed at serving the needs of the telecoms industry are still in their nascent stages, vendors including IBM, Oracle, and Huawei are among the earliest vendors to bring solutions and industry-specific use cases to the telecoms market, many of which focus on internal improvements to CSP operations.
- The long-term value of blockchain is in the internal improvements CSPs are able to make to operations and business process as a result of implementing the technology and despite interest from CSPs and a growing number of vendor solutions on the market. CSP uptake of blockchain (especially for external, partner use cases) will be minimal over the next three years as concerns such as technology standards, regulation, solution maturity, and industry use cases have yet to be addressed.



Recommendations

▪ Recommendations for service providers

- CSPs considering adopting blockchain should begin by making practical decisions about where blockchain fits within their organization. Although there are seemingly many possible use cases for blockchain that can be translated to the telecoms industry, many of these might not actually offer any significant upgrade over traditional vendor solutions. CSPs must make practical decisions about where to introduce blockchain, such as in complex partnership scenarios, or in processes that can benefit from the use of blockchain's smart contracts.

▪ Recommendations for vendors

- Vendors developing or considering developing CSP-targeted blockchain solutions should understand that blockchain will be a niche technology. Unlike other ancillary technologies, such as artificial intelligence, blockchain is not a technology that will be a good fit for every or even most CSPs and vendors should therefore temper their expectations for adoption and revenue growth of the technology.
- Vendors should be actively involved in POCs for blockchain in the telecoms industry. POCs will play a major role in demonstrating to the industry the power and value of adopting blockchain over other technologies. Furthermore, vendors can use POCs to better understand CSP needs and industry and technology limitations, and can produce case studies to create more interest in their solution.



Market status



Blockchain can be a powerful tool for the telecoms industry

- Blockchain is a distributed ledger database technology that enables data to be shared among users via a consensus mechanism without the need for a centralized authority.
- Blockchains work by recording transaction logs known as hashes in chronological order on a block.
 - Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.
 - Potential transactions must first be broadcast to, acknowledged, and accepted by the network in order for them to occur. This prevents "double spending" or multiple transactions interfering with one another. Following this process enables users on the network to create an immutable record of activity.
- Blockchain has the potential to be a powerful tool within the telecoms industry, with the ability to improve trust, visibility, security, and efficiency across operations and business processes. There is much to be gained in the way of improving the efficiency and effectiveness of transactions that occur between CSPs and third parties such as interconnect partners.
 - Within the telecoms industry, blockchain has the potential to make a significant impact on everything from interconnect, partner management, identity management, and mobile payments, to internal improvements to operations and automation.



CSPs are showing interest in blockchain initiatives

- Although blockchain technology has been around for a decade, the technology has only gained traction as a tool for change in an enterprise setting over the last several years when industries such as the financial services, retail, and logistics industries have successfully implemented blockchain to address industry pain points. The success of the technology in these industries and the resulting use cases have served as a catalyst for investment in blockchain in other industries such as telecoms.
- An increasing number of CSPs are now showing interest in adopting blockchain technology. According to Ovum's ICT Enterprise Insights survey, 55% of CSPs plan to deploy or trial private blockchain in 2019.
- In addition to some early activity from (primarily tier-1) CSPs, several industry-related consortia are now focusing on bringing blockchain to telecoms.
 - The **Hyperledger** consortium was founded in 2015, and focuses on open-sourced blockchain projects across multiple industries. Many notable CSPs including Deutsche Telekom and Swisscom have been active members of the Hyperledger consortium.
 - The **Carrier Blockchain Study Group (CBSG)** consists of CSPs (including Telefonica, Etisalat Group, and Sprint) from across the globe exploring the potential to build a next-generation, cross-carrier blockchain network.
 - **ITW Global Leaders' Forum (GLF)**, which is comprised of wholesale carrier executives, has led the way on blockchain in telecoms, running several POCs on blockchain to improve interconnection.



Tier-1 CSPs are among the early industry adopters of blockchain

AT&T

- Announced in 2018, a suite of blockchain solutions for B2B customers in the retail, manufacturing, and healthcare industries.
- In 2018, a patent was won for a blockchain-powered system that would create a “social media map”.

China Mobile

- A patent filed with China’s State Intellectual Property in 2016, revealed the CSP’s plans to develop a blockchain network aimed at managing mobile top-up requests.

Verizon

- In 2018, the CSP announced intentions to launch blockchain platform services for B2B customers, using capabilities from Guardtime and focusing on security and privacy.

Telefonica

- The CSP announced in 2018 plans to use blockchain to streamline core business processes by improving the reliability and transparency of information from different sources for network and business processes.

AT&T, China Mobile, Verizon, and Telefonica are just some of the tier-1 CSPs that have invested early in blockchain.



Colt's active role in the advancement of blockchain in telecoms

Who

- European-based wholesale fiber provider Colt, along with PCCW and other wholesale carrier members of ITW Global Leaders' Forum (GLF), came together to test whether blockchain could be used to make the settlement of wholesale voice more secure and more efficient.

Problem

- The interconnect process is extremely laborious for CSPs, with interconnect settlement usually taking a month to complete on average. As a result, Colt set out to determine if blockchain could be used to streamline this process and make it more efficient.

Implementation

- Colt, along with the GLF, contracted blockchain startup Clear to develop a settlement solution using blockchain. Starting with two interconnect partners, Colt used historical data to test the solution and flag anomalies in information for human review.

Outcome

- Through the use of Clear's blockchain solution, which uses smart contracts and other elements, the participants of the POC were able to reduce the interconnect settlement time from weeks to less than one minute.

Next Step

- In phase two of the POC, additional interconnect partners were used to test the scalability of the blockchain solution and the resulting impact the scale had on latency. The group also acknowledged the need to address challenges such as establishing a governance model and integrating the solution with other systems throughout the organization.



Emerging vendor solutions



IT vendors bring telco-grade blockchain to the telecoms industry

- In attempts to capitalize on the growing interest in blockchain, a number of vendor solutions have recently appeared. Although so far a large portion of blockchain's activity and solutions come from smaller, blockchain-focused vendors and startups, IT vendors familiar with the telecoms industry have also begun to bring blockchain solutions to the market.
- Microsoft, Amazon, and Cisco are some of the vendors that have recently announced the launch of a horizontal blockchain platform or solution. However, many of these solutions remain in the early stages and without a clear view of how they will play in the telecoms industry.
- On the other hand, IBM, Oracle, and Huawei are among the earliest vendors to bring solutions to the telecoms market along with several CSP-specific proposed applications and use cases of blockchain in the industry.



IBM fact sheet

Product name	<ul style="list-style-type: none"> • IBM Blockchain Platform • IBM Blockchain Services • Blockchain Networks: IBM Food Trust, TradeLens, IBM World Wire, IBM Trusted Identity 	Release date	December 2018
Version number	IBM Blockchain Platform based on Hyperledger Fabric v1.4	Number of telco deployments	4
Industries covered	Telecommunication, media and entertainment, aerospace and defense, automotive, banking and financial services, chemical & petroleum, consumer (retail and consumer goods), electronics, environment energy & utility, government & education, healthcare & life sciences, insurance, travel & transportation		
Licensing options	SaaS: <ul style="list-style-type: none"> • IBM Blockchain Platform Starter Plan • IBM Blockchain Platform Enterprise Plan • IBM Blockchain Platform for IBM Cloud Private • IBM Blockchain Platform for AWS 		

Source: IBM



IBM fact sheet continued

Ledger-to-ledger interoperability	Yes	Pricing options	Platform pricing includes monthly fee (membership fee plus peer fee), services fee
Blockchain network name	IBM Food Trust, IBM Trusted Identity, TradeLens, We.trade, CLS, Mediaocean	Available blockchain permissions	Channel config is versioned, permissioned, hierarchical
Average deployment time	Starter plan provides one-click network configuration	Number of employees supported on solution	Unlimited

Source: IBM



IBM Highlighted use cases

▪ **OSS/BSS with Blockchain**

- Blockchain-based solution that governs the order-to-provisioning process of telco enterprise services, lifecycle management of VNFs
- Business benefits:
 - Increased cost efficiency based on a streamlined order to provisioning process and the elimination of manual reconciliation activities
 - Faster sales cycles and increased throughput to accelerate revenues
 - Simplified provisioning process to enable the reach of a wider target, hence increasing revenues
 - Visibility of lifecycle of virtual network services

▪ **Blockchain for Network supply chain**

- Supply chain integrated with blockchain to bring visibility to network participants, execute SLA-based smart contracts, and device and service security
- Business benefits:
 - Full transparency and visibility over transaction, asset inventory, and lifecycle
 - Reduced cost of managing SLA-based billing
 - Security assurance of the device and the service



IBM highlighted use cases

▪ **Transparent ad supply chain**

- Shared ledger as common source of truth, reducing leakage, commoditizing parasitic supply chain players that thrive only because of fragmentation, and streamlining sales and true-up processes of linear television.
- Business benefits:
 - Transparency will reduce >2% “leakage”
 - Shared system of truth will commoditize data governance, pre-bid evaluation, ad metrics, content analytics, verification, ad discrepancy management, attribution and retargeting, making more effective while reducing costs.

▪ **Music royalties collection**

- Leverage Blockchain technology to streamline the royalty collection process for music rights. The rights collection agencies know they only collect a certain % of the digital revenue. Using blockchain will help to improve the collection of revenue owed to the artist.
- Business benefits:
 - By improving the royalty collection process to close to 100%, artists will get the actual revenue deserved
 - Royalty collection agencies will gain greater trust and can therefore more music labels and artists



IBM highlighted use cases

- **Mobile payment with eSIM activation**

- Intelligent vending machine with mobile payment and eSIM activation for tracking using IoT.
- Business benefits:
 - For retailers: easy implementation with automated processes to run global vending machines
 - For CSPs: Alternate revenue opportunities by creating and managing ecosystems of retailers, vendors, and buyers

- **SLA monitoring**

- Automation and streamlining of incident ticket in SLA-based operations using smart contracts in a blockchain.
- Business benefits:
 - Real-time transparency of data on the network in addition to the SLA on the blockchain as one source of truth
 - Reduced settlement times
 - Significant reduction in the cost of SLA monitoring due to reduced time to implement and manage SLAs



IBM highlighted use cases

▪ **Dispute resolution**

- Improve the efficiency of commercial financing business by sharing data securely and transparently on the blockchain solution originally implemented for IBM Global Financing.
- Business benefits:
 - Reduces disputes resulting in savings
 - Faster settlement means a reduction in dispute resolution time from 40+ days to less than 10 days

▪ **Trusted identity**

- Enables secure and private attribute sharing through range a network of trusted parties including banks, credit bureaus, telcos, government, and others.
- Business benefits:
 - Telcos benefit from being one of the biggest consumers of digital identity and a significant channel shift toward lower costs and automated online acquisition and support channels without fraud. These benefits help reduce existing costs while supporting new lower ARPU growth areas such as IoT.
 - Additional opportunities exist for telcos to act as a source of identity and authentication, bringing new revenue streams, creating product stickiness, and reducing churn. As solution providers, telcos can help proliferate these services to enterprise and government customers.



IBM highlighted use cases

▪ **Roaming, fraud, and overage management**

- Hyper-ledger fabric with smart contracts that governs the transactions between the CSPs acting as home operator and roaming partners to track the activities of mobile users on the network.
- Business benefits:
 - Enables near instantaneous resolution of charges, eliminating costly third-party processes such as clearing houses.
 - Accelerates and validates dispute resolution among operators.
 - Provides identity management across CSPs to mitigate roaming and subscription fraud.
 - Offers real-time alerting of overage issues.

▪ **Mobile number portability**

- End-to-end management of the number portability process, including customer request and confirmation, approval by donor carrier, balance information transfer, and notification to regulator.
- Business benefits:
 - Speeds up the process from months to hours.
 - Provides all participants with share information, reducing ex-post reconciliation.
 - Makes the process seamless for the customer.
 - Migrates all the relevant customer information.
 - Opens opportunities for new requirements and capabilities, such as do not disturb.



IBM highlighted use cases

- **Eliminating CDRs to enable real-time fraud detection, dispute-free settlement, and billing**
 - CDR transaction details and roaming transaction details (TAP/NRTDE) stored in the blockchain to give complete transparency to internal applications.
 - Business benefits:
 - Near real-time data availability to all participants in the network resulting in:
 - Fast action on roaming data provided.
 - Automatic triggering of roaming contract enables near-real-time charging which reduces roaming fraud.
 - Faster dispute resolutions through clear transaction history between operators.
 - Single source of the truth is maintained to reduce multiple conversations between parties, reducing disputes.
 - Cost savings from removing the data clearing house.



Oracle fact sheet

Product name	Oracle Blockchain Cloud Service	Release date	August 2018
Version number	Release 18.4.5	Industries covered	Communications, financial services, logistics, manufacturing, retail
Licensing options	Subscription	Pricing model	Transactions per hour
Number of telco deployments	N/A	Ledger-to-ledger interoperability	Upcoming
Blockchain network name	Customer-defined	Available blockchain permissions	Permissioned model based on Hyperledger Fabric with enterprise-grade access-control mechanisms
Average deployment time	Use-case dependent	Number of employees supported on solution	Unlimited



Oracle highlighted use cases

CSP-related use cases being considered with Oracle Blockchain Cloud Service:

- **Supply chain applications**
 - Oracle has announced dedicated Supply Chain Blockchain applications
- **Fraud prevention**
 - Blacklisting
 - Device tracing
 - Call Spoofing
- **Peer-to-peer platform management**
- **IoT provisioning and management**
- **Media/content distribution and rights management**
- **Asset management and pricing**
- **Contracts management/updates**
- **Customer nuisance calls/do-not-call preference registries for SMS-based marketing**

Source: Oracle



Huawei fact sheet

Product name	Huawei Cloud Blockchain Service (BCS)	Release date	February 2018
Version number	1.0	Industries covered	General blockchain platform
Licensing options	n/a	Pricing model	Peer and consult
Number of telco deployments	n/a	Ledger-to-ledger interoperability	Yes
Blockchain network name	Hyperledger Fabric	Available blockchain permissions	Basic, professional, platinum
Average deployment time	< 10 minutes	Number of employees supported on solution	80+ for BCS

Source: Huawei



Huawei highlighted use cases

▪ **Trusted data sharing, health, and government taxation**

- Data exchange will benefit companies and institutes with limited data collection capabilities, promoting innovation and creating new sources of revenue. However, because data exchanging is often illegal, and because of the low transparency of information and ease of data tampering, data exchange remains limited. Because it is decentralized, secure, tamper-proof, and traceable, blockchain can help to build trust among participants and promote the growth of data exchange. With information on data ownership, exchange and verification scope recorded in the blockchain, the data ownership can be confirmed, and a clearly defined scope of verification can also regulate the use of data. Each step from data collection to distribution is also recorded in the blockchain. Data is therefore traceable, and the quality of the data can be enhanced by limiting data sources. Decentralized data exchange platforms based on the blockchain can promote global large-scale data exchange.

▪ **Supply chain finance**

- By using blockchain, cost reductions can be realized by optimizing existing processes, such as the value chain for cross-border payments, account checking, user identity verification, and anti-money laundering. It is also achieved by facilitating information sharing in supply chain finance and inclusive finance. With Huawei's BCS, enterprises can use blockchain to build a reliable information network between companies and financial institutions in the supply chain, enabling entities to obtain information from the sources of corporate management, and ensure that E2E information is transparent and tamper-proof. In this way, all participants can share data on business flows, material flows, and capital flows through a decentralized record-keeping system.



Huawei highlighted use cases

▪ Supply chain and logistics

- Tamper-proof data, transaction traceability, timestamp existence proof, and other features of blockchain can ensure effective accountability and prevention of counterfeiting, helping to resolve disputes over tampered data between related parties of the supply chain.
- Three categories of products require traceability of the supply chain: edible products (for example, meat, vegetables, fish products, baby formula, Chinese herbal medicines.); high-end consumer goods (for example, premium wine) and high-end art (for example, relics, gemstones); and documents and certificates (for example, property ownership certificates, academic certificates.). Blockchain can support a source-tracing system that involves all upstream and downstream companies of the entire supply chain, so that the source, trajectory, and accountability of products can be traced.

▪ Copyright protection

- Using Huawei BCS, a data content copyright company can implement the data content copyright. When an author and content is certified on the platform, the corresponding copyright certificate is generated. The certificate will be connected to the copyright management institute and can be easily traced and protected. Based on the blockchain copyright trading platform, data content copyright companies can provide a low-cost and efficient copyright deposit solution for massive work. The copyright deposit time is reduced to real-time copyright certificates to promote the rational and legal circulation of copyright.

Source: Huawei



Market outlook



The CSP blockchain market will take a while to heat up

- **Although there have been several blockchain initiatives launched by enthusiastic CSPs, the overall blockchain market will take time to kick into gear for vendors.**
 - Ovum anticipates minimal uptake of blockchain technology over the next three years, because the telecoms industry is known to be slow on technology adoption. Despite this, as more vendors enter into the CSP blockchain space, we expect an increase PoC activity, as well as more variety in the type of use case the POCs will attempt to test.
 - Those that adopt the technology early will fall into one of two categories: innovators or early adopters. Innovators will be CSPs, such as Colt or China Mobile, that either develop proprietary, patented blockchain solutions, or work closely with vendors and other bodies on extensive proofs of concept. Early adopters will be CSPs, such as Telefonica, AT&T, and Verizon, which are among the earliest to work with vendors to deploy blockchain solutions for public consumption.
 - The current blockchain market is akin to the early IoT market of 2015/16. Early adopters have launched consumer-targeted solutions without a real feel for the market need or any real sustainable plan for the future. Just as CSPs came to realize that a solid IoT proposition required more than just providing IoT connectivity, they will need to come to a similar realization about blockchain. The long-term value in blockchain is less likely to be consumer- or enterprise-focused and more likely to be in the internal improvements CSPs are able to make to operations and business process as a result of implementing the technology.
 - Ovum expects large-scale CSP adoption of blockchain to begin in 2025 as early adopters deploy blockchain internally to improve operations and launch consumer/enterprise-focused solutions.



The CSP blockchain market will take a while to heat up

- **There are still several practical challenges that need to be worked out before wide-scale adoption of blockchain among CSPs.**
 - Although Colt, along with the GLF, has made some early progress in terms of testing the potential usability of blockchain in the industry, there are still several challenges that must be addressed and tested before the industry will see wide-scale adoption.
 - Telecoms-specific technology standards must be established by an industry-governing body such as ETSI or TM Forum.
 - Regulation guidelines for blockchain, specifically when dealing with third-party information, have yet to be clearly defined and could therefore hinder CSPs' ability to use the technology in many scenarios.
 - More proofs of concept will need to be conducted to test the reliability and scalability of blockchain in a telecoms setting. Although use cases outside the industry can be used as a reference for reliability and scalability of blockchain in an enterprise setting, telecoms has a unique set of challenges, such as volume and no operational downtime, that cannot be translated from other industry use cases.
 - Standardization in both vendor pricing of blockchain solutions and CSP pricing of commercial blockchain offerings will need to take shape.



The CSP blockchain market will take a while to heat up

- **Telco-grade blockchain solutions will need to mature.**
 - The blockchain vendor space has been active for several years and there are a number of horizontally focused solutions available on the market today from blockchain specialists and more traditional IT vendors. However, a solution might address a challenge that is relevant across industries (such as improving visibility in complex processes), but this doesn't mean it can be easily translated across industries. As a result, the biggest hindrance to the rate of adoption of blockchain in the telecoms industry will be the availability and maturity of telecoms-grade blockchain solutions. Solution maturity will come as a direct result of extensive POCs and live deployments and the resulting feedback that will aid in the further development of blockchain solutions for the industry.
 - Increased adoption of blockchain will be dependent on the prevalence of use cases, customer references, and case studies made available throughout the industry.
 - Because the industry is typically slow to adopt new technology, consulting services will play an important role in growing the adoption of blockchain.
 - Being able to demonstrate to CSPs a clear cost/benefit analysis of blockchain adoption over existing solutions is also another factor that will help to drive the uptake of blockchain.



Appendix slides



Appendix

Methodology

The information included in this report is based on both primary research gathered through interviews, discussions, and inquiries with CSPs and IT vendors, and secondary research from publicly announced contracts, partnerships, and previously published research.

Further reading

Blockchain in Telecoms, SPT001-000029 (September 2018)

Blockchain for Beginners, IT0059-000071 (September 2016)

"Blockchain has more to offer CSPs than inventory management," SPT001-000019 (May 2018)

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