



5G and IoT are disrupting and redefining the telecommunications industry, fueled and accelerated by more devices and data than ever before. This influx will generate new products, services and use cases that, if capitalized, can produce enormous business potential for telecom players.

However, to take advantage of the opportunities afforded by 5G and IoT, telcos will need to transform the way they do business with one another. They will need to shift from current inter-carrier relationships and transactions - which are characterized by high-friction, low-trust, manual transactions - to seamless collaboration, coordination and trade. Only by streamlining inter-carrier coordination, will telcos succeed in creating new and innovative products and services.

This type of shift can only happen with a secure, efficient and scalable financial and legal backbone to support the exponential growth in transactions, data and complexity. This is where blockchain comes in.

This article will explore how blockchain technology, by automating trust and streamlining inter-carrier transactions and innovation, can help telcos capitalize on new 5G-enabled revenue streams.

## **Blockchain-Enabled Opportunities in Telecom**

Fundamentally, the blockchain is a secure, automated record of transaction data that creates a shared source of truth among parties. Transactions are recorded and verified on a shared ledger that is updated every time a new transaction occurs. Thus, trust is not established externally by a central authority or an auditor, but continuously within the network, eliminating the need for a centralized authority or in-house bookkeeping.

Moreover, transactions are immutable (transaction cannot be easily altered), enforceable (business terms can be embedded and executed automatically), private (transactions are reliable, authenticated and verifiable) and transparent. This is critical for an industry like telecommunications with highly sensitive data, multi-party transactions and complex products and services.

Blockchain will play a critical role in telecommunications by enabling efficient, secure and cost-effective ecosystems and unlocking new revenue opportunities for telcos.

Some examples of blockchain-enabled opportunities include:

### **Identity Management**

Blockchain technology can be used to eliminate frustrating and risky identity authentication processes, enabling telcos to make use of relevant subscriber data and monetize identity and authorization services.

The current process whereby users must prove their identity and credentials to access their online accounts or services is time-consuming, inconvenient and risky. Blockchain can be used to provide users with a digital identity that can be used across devices, applications and organizations – removing the need for a user to have separate passwords for different online accounts. With this digital identity, individuals can decide which services get their personal information, thus regaining ownership of their digital identities while reducing the cost and bureaucracy of ID verification.

### **Fraud Management**

Blockchain-based solutions can be used to minimize fraud, which costs the telecom industry over \$38 billion each year.

For identity fraud, blockchain-based solutions could be used to change the way identity is currently verified. Currently, a physical SIM is used to identify and authenticate subscribers on mobile devices, linking the device to the subscriber account with the carrier. Using blockchain, telcos could instead identify a device, and link the device (with its own private key) to a subscriber's identity. The private key is associated with only one particular device and is hence difficult to steal - thus minimizing both subscriber or other ID-based fraud.

In roaming, fraud could be reduced by implementing a permissioned blockchain between every pair of operators that have a roaming agreement. When a subscriber triggers an event in a visiting network, a smart contract and the terms of the agreement between the roaming partners are executed. This allows instantaneous and verified authorization, as well as settlement to occur – reducing costs and reducing fraud.

### Mobile Payments

For mobile payments, a cross-carrier blockchain payments solution can enable local mobile phone subscribers from different networks to make quick payments with their phones when they travel abroad. For example, TBCA Soft, Softbank and Synchronoss recently announced a PoC to facilitate global mobile payment services among global telecommunication carriers.

### 5G and IoT: Opportunities & Challenges

One of the most anticipated revenue opportunities for telecom has to do with 5G-enabled use cases - which present a [revenue opportunity of USD 204–619 billion by 2026](#) for operators, in addition to the forecast telecom service revenues of USD 1.7 trillion in 2026. 5G promises to offer the high-speed, flexible and agile internet needed for use cases with far higher reliability requirements than are possible today, serving as the connective tissue for the Internet of Things (IoT), autonomous vehicles and mobile media, to name a few.

However, as the number of devices, data and use cases grows exponentially (an [estimated 30 billion connected devices by 2020](#)), telcos will increasingly need to transact and collaborate on service delivery and innovation,

responsibilities and revenues across geographic and regulatory boundaries in order to capitalize on new business models and revenue streams.

Current inter-carrier relationships and processes aren't built for this type of collaboration and innovation. For one, trust and privacy are primary concerns, preventing many telcos from sharing sensitive information. As a result, many inter-carrier transactions are done manually in-house, making them costly, prone to error and fraud and plagued by complex and lengthy disputes. Moreover, manual transactions can't scale. Second, many telco legacy systems are ill-equipped to offer automation of inter-carrier billing and settlement involving multi-party multi-dimensional products. Third, due to the reasons stated above, telcos find it increasingly difficult to develop and implement new business models and contracts without significant IT investment. This is detrimental to innovation, which hinges on the ability to move fast and deliver even faster.

For example, to commercialize next generation services such as autonomous vehicles and cloud computing, telcos will need to collaborate to deliver hyper-connectivity, ultra-high speed and ultra-low latency, as well as highly contextualized and personalized experiences, delivered on-demand over wide distances or other similarly demanding constraints. This is currently not possible due, in part, to manual inter-carrier settlement and billing processes.

### **Unlocking 5G-Enabled Revenue Opportunities with Blockchain**

To capitalize on new 5G use cases and revenue opportunities, telcos must transform the way they do business with one another.

Telcos must shift their current inter-carrier relationships and processes which are characterized by high-friction, low-trust, manual transactions - into seamless, agile collaboration, coordination and trade. Only by streamlining inter-carrier coordination, will telcos succeed in creating new and innovative products and services.

However, this type of shift can only happen with a secure, efficient and scalable financial and legal backbone to support the exponential growth in transactions, data and complexity.

This is where blockchain comes in.

1. Legal and financial backbone for direct, flexible and automated multi-carrier, multi-product coordination, settlement and billing:

By automating inter-carrier financial transactions, contract enforcement and dispute resolution, blockchain can help telcos more easily manage, simplify and optimize complex transactions and interdependencies across different ecosystems. Moreover, smart contracts enable the real-time provisioning of connectivity, services and payments across carriers. This creates a unified financial and legal layer that enables stronger, more efficient and collaborative business relationships among carriers.

2. Programmable smart contracts:

Within a private blockchain, the rules and agreements among various CSPs can be coded in smart contracts, which are stored on the private blockchain. However, while smart contracts are immutable, the parameters can be easily and instantly changed if required. This allows carriers to rapidly create and enforce customizable contracts to support new, complex business models, with little additional IT resources.

3. Flexible, friction-less industry-wide networks:

Once trust across the business network is ensured, telecoms can more easily communicate, collaborate and innovate to bring new products and services to market.

To demonstrate how blockchain can help telecom operators address these issues, two Proof of Concepts (PoC) are currently underway within the ITW Global Leaders' Forum and MEF Forum. Each PoC brings together leaders in blockchain technology with some of the largest network operators in the world.

The objective of the first PoC, that was led by Colt, PCCW and Clear Blockchain Technologies and later expanded to include BT, Telefonica and Telstra, was to ascertain if the advantages

offered by blockchain technology could be applied to make inter-carrier settlements more efficient, reliable, and scalable. This PoC was specifically focused on the settlement area of wholesale voice minutes, as most telecom operators have similar processes for these transactions.

In May 2018, Colt reported that “in the trial, the application of blockchain’s decentralized, cryptographically enforced, immutable ledger technology resulted in tens of thousands of call records being analyzed and settled in a few minutes. Using blockchain technology, hundreds of hours of manual work were reduced to seconds of automated verification and settlement.”

In October, Clear is working with PCCW, CBCcom, Sparkle, and Tata Communications to launch a Bandwidth on Demand PoC to demonstrate how blockchain can help telecom operators commercialize next generation services, such as VR, autonomous vehicles, cloud and IoT. This PoC will be a central part of the upcoming MEF18 Conference in Los Angeles in October.

“5G presents an exciting opportunity for telcos to capture value from new products and services by revolutionizing inter-carrier trade and collaboration - making it more seamless, agile and coordinated than ever before. We’re demonstrating how blockchain technology has moved from concept to reality to do exactly that. By creating a blockchain-enabled settlement and clearing network, we’re helping telcos more efficiently scale inter-carrier operations and better collaborate to deliver new and innovative products and business models,” said Eran Haggiag, Executive Chairman of Clear Blockchain Technologies.

5G and IoT present exciting new revenue opportunities for telecom. However, with the exponential growth in data and devices comes increased product and service complexity. To deliver these products and capitalize on new revenue opportunities, telcos will increasingly need to transact and collaborate on service delivery and innovation.

Today, this type of collaboration is characterized by high-friction, low-trust transactions among carriers. If not automated, the billions of new financial transactions and processes will engulf traditional carrier financial operations. This will severely limit the ability of carriers to scale and capitalize on new 5G-enabled revenue streams.

Blockchain can help. Blockchain technology can create a unified financial and legal layer to automate inter-carrier relationships, establish trust and facilitate the development of new and innovative products and services.