
Blockchain in telecom – Do we want to take that jump?

Blockchain technology is getting tremendous traction in the world. We want to look at the use of this tech in the telecom industry – the probable areas of use, what the leaders are doing and where Wipro can help it's clients deploy in the future.

What is Blockchain?

We all associate Blockchain with Bitcoins. To be fair, that's how it started – Bitcoins were/ are transferred through blockchain before other use cases were imagined and developed. And now this technology is fast evolving to disrupt the way transactions are being processed, users are being authenticated and payments are being executed. Fintech was one of the earliest industries to first adopt the technology. However, there are varied possibilities in almost every industry. In this document, we will see the implications and opportunities that are available in the telecom industry.

Blockchain is a shared ledger that is replicated across users in a particular network. The ledger maintains all the transaction details between parties. The entire system becomes highly secure, transparent and devoid of any restricting intermediary that we all depend on in any similar transaction-based network available. If a customer requests for a transaction (let's say order bread from Amazon), this transaction will be transmitted in the Blockchain network through its own unique #. One of the nodes will identify the # and verify it and enable the transaction to be completed.

At no given point in time does the node get to know who the final end customer or vendor is. Hence, Blockchain is an incorruptible digital diary comprising of transactions (can be data, currency or anything of economic value). Each transaction is unique and gets recorded in a distributed system that can never be lost.

Telecom organizations in 2019 – How are things shaping up?

Interestingly, the way the telephone connects people hasn't changed dramatically over the last 20 years. Yes, our SIM cards have grown smaller and we now have many ways to transmit audio, video and text over the internet, but the core telephone logic based on the SIM cards (which were developed way back in 1991) has not changed. What has completely changed is the way we treat data. The speed of transfer over the internet cannot be compared to three or maybe four years back. 5G, which is being tested currently, will allow ever higher data transfer rates, minimum network latency and a huge system of interconnect devices. We will see application of using IOT devices, sensors, facial recognition, AR, VR to achieve a variety of use cases previously unimagined.

Both providers and subscribers struggle with roaming, high fees, risk of fraud, privacy issues and so much more. After exploring potential solutions, decentralization (which is one of the core fundamentals of Blockchain) could be the key to solving those issues.

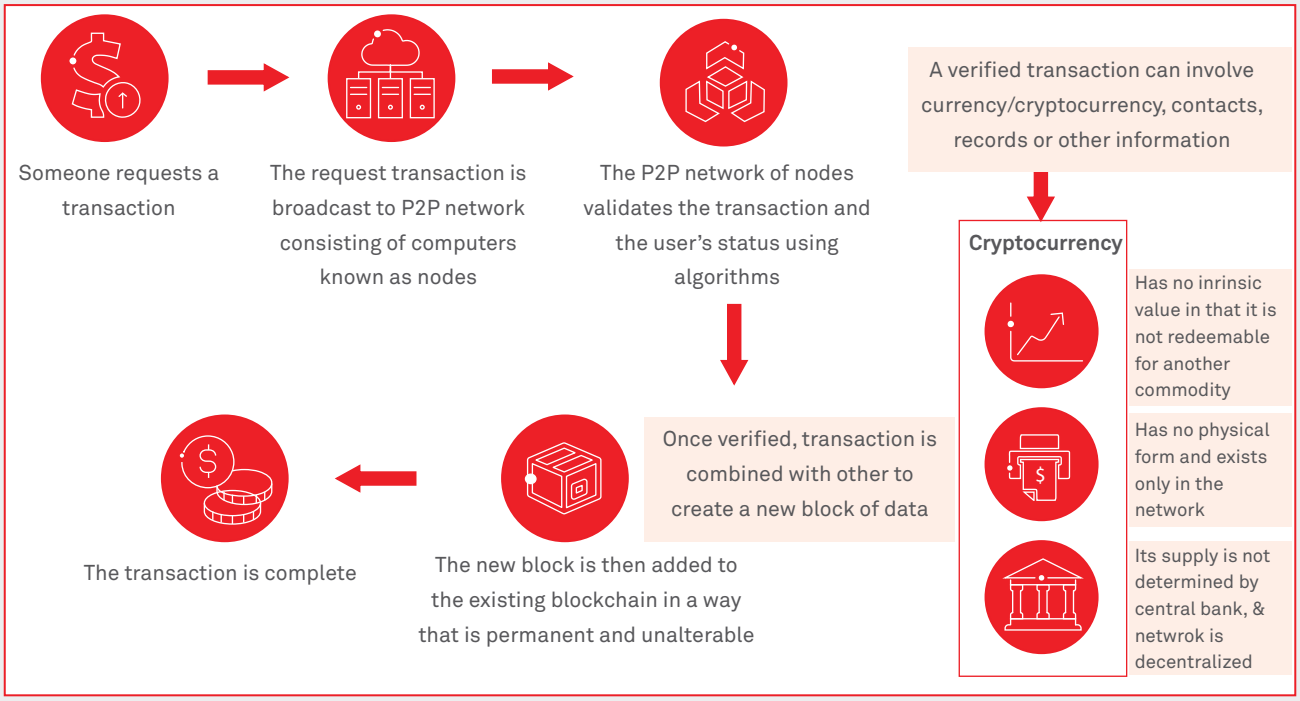

Figure 1: How Blockchain works

Pain points in the industry and how can Blockchain act as a solution to these problems

Organizations are looking for new innovative ways to reduce underlying costs and improve business profitability. We look at a few modern pain points of the telecom industry and why should they look at Blockchain as a tech intervention to solve for the future:

1. **Network & infrastructure** – Telcos are complex and they require significant infrastructure projects and investments. Almost all telecom organizations have undergone the 4G/LTE network set up and by the time they reap benefits, we already have 5G coming in forcing them to upgrade again.

2. **Business/operation support systems** – Existing technologies are not collaborative, stubborn and protected. They have always resulted in poor customer experience, have poor implication on profit & loss statements due to leakages and process inefficiencies.

3. **Price wars** – the slurry of new age telecom providers entering the market has made the end customers spoilt. With service providers having to almost unanimously give abundant free calls and data packages to the consumers, we are looking at underutilized data, calls, SMSs from almost all subscribers.

4. **Frauds**: According to a report released by Deloitte[1], Communication Service Providers (CSP) lose ~ USD 40 Bn every year due to fraudulent activities.

How can Blockchain help these situations

1. **Decentralization and the sharing economy** – The core solution of this problem can be solved by decentralization – which is one of the core features of the Blockchain method. For example – ground infrastructure is not owned by all service providers, but a few. Organizations come together and use the same to avoid rebuilding expenditures. Tata and Reliance built the underground infrastructure for internet in India – the same is used by almost all other organizations.

2. Similarly, when we talked about internal systems being used currently, we are looking at an extremely siloed, rigid and complicated ecosystem. In the future, if we intend to reap benefits from interdependent teams collaborating on this ecosystem, we will need Blockchain to help eliminate middlemen. Therefore, in processes such as quote to cash, Blockchain can be used to bring relevant use cases such as inter carrier settlements, carrier changes and efficient MNP.

3. Blockchain can truly enable "Anything as a Service" for consumers. Imagine a marketplace exists where one customer is selling unused data and another customer is trying to sell free calls package? This Blockchain enabled market will operate directly within the millions of subscribers of the telecom organization and ensure optimum utilization of a telecom's resources.

Use cases in telecom

With the multiple pain points coming, we also have emerging technologies like Blockchain that helps CSPs to work and keep themselves profitable and relevant in the market. In this section we will try and correlate the use case as per the pain points mentioned in the section above:

1. Almost all organizations started to board the 4G/LTE train when it began. The investments were significant, and the ROI was barely making it. Competition is anyway quite high and then you have heavily invested entrants who are willing to bleed the competition to death. (Jio can be a great example in India). It is all but natural for organizations to start sharing the new infra costs. The term coined "sharing economy" brings in its own complications and challenges. Multiple vendors and contracts are the norm in this scenario. How does Blockchain help? Due to its decentralized features and transparency, Blockchain allows a level playing field for telecom players.

2. In the business/operation support systems scenario, you could look at services provided by Telcos as a complex ecosystem when it let's say undergoes the entire Quote to Cash value stream. The entire ecosystem is complex with multi-threaded supply chain ecosystem that requires interdependent teams. Blockchain would enable use cases where telcos will be able to remove middlemen in inter carrier settlements, prevent fraud during roaming and mobile number portability processes. It can also solve process inefficiencies by building efficient supply chain systems.

3. Fraud prevention is another use case that Telcos are depending on Blockchain to help cater to. If we have to calculate fraud costs – we are looking at ~ USD 40 billion (Deloitte) annually. Using Blockchain we can look at significantly decreasing the cost of fraud in roaming and in identity management.

4. **Micropayments** – This is another fantastic use case currently in use for multiple telecom operators. The telecom organizations can utilize Blockchain to enable these payments for OTT services such as payment wallets, music applications, games etc. These services along with user to user monetary transfer services can result in positive revenues for the service provider and hence impact the company in a positive manner.

5. **Smart contracting** – automation of internal processes through Blockchain. We can look at processes such as billing, roaming and supply chain management. The present transactions operate through ledgers that need to undergo a clearing house to get approved. By using Blockchain, Smart Contracts can automate this process and guarantee the settlement between the participants, by routing from one operator's Blockchain to another operator and increase transparency to the end customer.
Assume a subscriber is operating while on roaming and dials out on the phone network. This transaction is logged on the Blockchain network (from the call being picked up to the call being ended) and saved. The smart contract rules define the charges and the payment is registered. The transparency from point A -Z ensures the integrity of the transaction.

The above use cases are an indication of the areas where Blockchain can play a part in organizations. However, the border of this playground is yet to be defined as we move ahead in this technology's implementation. The following section looks at some of the existing implementations that some of the leading telcos have deployed so far.

How are the existing telecom organizations using Blockchain?

1. **Telefonica** – has associated itself with IBM to enable Blockchain in their endeavors. They are utilizing IBM's blockchain platform to log information collected by different networks when routing international calls. The intent is to improve reliability and transparency of information collected. The operators working in the routing of these calls will have an access-based authentication on a decentralized platform that will own this information. That will provide access to real-time tracing of calls to allow for correct billing processes between operators[2].

2. **Deutsche Telecom** – Through their subsidiary T-Systems is working on a German Blockchain Ecosystem (GBE) and will offer organizations with a platform for blockchain networks[3]. This will make T-Systems the first European digital service provider to launch a blockchain as a service marketplace. This digital marketplace will allow customers to map different applications using blockchain. For example – The above mentioned marketplace will allow participating organizations to map their total value chain using Blockchain. This will enable a visible digital display of an org's supply chain making operations faster, transparent and more cost effective. Inherently, this will enable trade, invoices, payments etc through the native benefits of blockchain in the 1st place. This significantly reduces fragmentation along the value chain as well.

3. **Vodafone** – This global telecom giant is part of a group of mainstream organizations working in collaboration with IBM, utilizing Blockchain to bring clarity and efficiency to transformed processes. IBM has christened this project as trust your suppliers – essentially connecting the suppliers of any organization through a common Blockchain. The supplier first will need to prove itself through background and verification checks in the Blockchain network and hence transact with the intended organization[4].

4. **AT&T** – similar to other players in the telecom circle, ATT is utilizing Blockchain to automate and transform their supply chain processes that impacts their products – handsets and network equipment. Any sort of product returns, upgrades/other activities that impacts the various components of the supply chain is being managed through the Blockchain route. The various suppliers are joined throughout the Blockchain network that allows security and transparency. What they are also doing is integrating IOT with the traditional Blockchain solution to customize it to suit ATT's requirements. ATT has already announced the ability of their customers to pay their telephone bills using Bitcoins[5].

5. **Airtel** – Telecom organizations have started to leverage Blockchain to enable micropayments for music, mobile games, and other value-added services. Airtel, offers digital wallets that enable customer-to-customer payments. Through Blockchain handling the transactions, Airtel ensures that the digital wallets are more secure with ID verifications.

Our verdict and what can be achieved further? Needless to say, Blockchain is here to stay and we can see the rapid adoption and deployment of this tech by the various leading telecom organizations. And in this journey, organizations such as ours can play a significant role in helping our clients moving into the future.

Wipro has built a Blockchain solution for Order Management and fulfillment process that provides end-to-end visibility and unparalleled data validation for order management with touchless invoice generation for participants in the SCM value chain.
It also integrates with IoT sensors to track tempering, temperature, shock and GPS-based route planning for moving assets. Few key features that compliments this offering are as follows:

1. Near-real time availability of relevant data on the shared ledger
2. Transparent collaboration of disparate parties in the business network
3. Smart contract enabled validation & business rules
4. Secured, shared immutable registry that becomes a "source of truth" for the process state
5. Peer-to-peer model which integrates different enterprises over a common network
6. Near real time tracking of moving assets
7. Automatic inventory check and adjustment against orders
8. Automatic invoice generation & reconciliation

We are looking at a future where we reduce dependency on traditional centralized software/ operators to provide an authentication mechanism. Imagine a situation where there isn't a requirement for expensive CRM/BRM software and organizations are able to track all transactions over Blockchain using identification #s. Imagine a scenario where end customers are able to trade their extra bandwidth of data within themselves. Blockchain can make all this possible.

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