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## **BLOCKCHAIN IN TELECOM**

INCREASE NETWORK EFFICIENCY & REDUCE ROAMING  
COSTS

# Blockchain Technology

Over the last two years blockchain has emerged as one of the key technologies that will greatly disrupt several industries. Organizations are quickly realizing the positive impact of adopting this emerging technology.

## Data silos

Traditionally businesses rely on large centralized databases and cloud infrastructure to store and process their data. These databases present many problems in an increasingly connected world. They're often siloed, making it difficult for multiple parties to settle on a single verifiable truth for all parties to agree on.

Relationships between suppliers, regulators, partners and customers are increasing in complexity rapidly. In order to manage these relationships, trust is needed. Traditionally that trust is provided by third parties or the lack of it is handled by risk management.

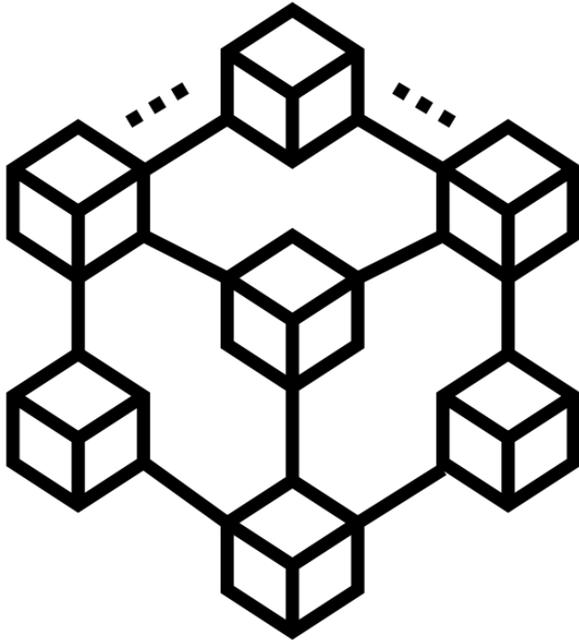
In a context where data is siloed it needs to be reconciled first and all parties need to settle on an agreeable single truth, slowing down transaction times and increasing their cost.

## A Network of Trust

Many organizations are examining blockchain technology to overcome the issues with purely centralized architectures. With blockchain, data isn't stored on a centralized database but instead stored and automatically replicated and shared across a network of databases and upheld by a consensus mechanism between peers.

This network is transparent and verifiable, allowing anyone that is signed into it to see a single source of truth on current and historical data. It also improves the efficiency, accuracy, and speed of transactions, minimizing disputes, and the need for intermediaries.

Exciting new use cases are merging across many industries enabled by blockchain, including supply chain. Finance, where users are in full control over their financials and no longer have to rely on banks. Provenance of assets become a verifiable, traceable and auditable, creating transparency throughout the lifecycle of a supply chain. The medical industry personal ownership of medical records that can be used universally at the person's discretion. Creative content ownership and distribution, where creators are not exploited by intermediaries, and receive direct compensation for their work.



# Roaming Bottlenecks

In roaming a customer traverses from the network of the home operator, to a visiting network. We will look at how blockchain can play a major role in increasing efficiency, reducing costs in both national and international roaming. In turn this could provide a better offering towards customers.

## Roaming Agreements & Clearinghouses

Roaming agreements contain the negotiated rules between the roaming partners for billing of services. The compliance to the minimum standards of such agreements as well as the settlement of roaming transactions is an **intensive administrative process**. This is especially true when the roaming operators have no direct relationship and settlement has to take place through a **third party clearinghouse**.

## Roaming Fraud

Operators do not always have clear visibility of their subscriber's activity when they are roaming, complementary to this visiting operators usually lack know-your-customer information about roaming subscribers on their network.

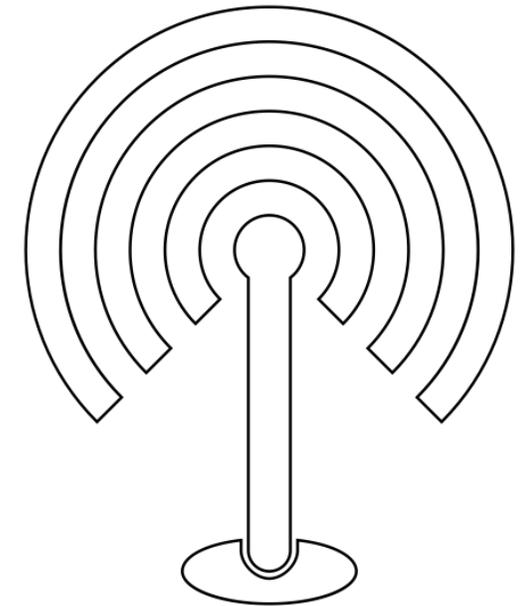
One of the most common types of roaming fraud is where a SIM card or MSISDN is cloned or stolen. The fraudster then moves it away from the home network to a visiting network to use services without intending to pay for them. The home operator or legitimate owner of the SIM/MSISDN is then responsible for the costs incurred.

Fraudsters take advantage of operators' **inefficient roaming reconciliation and know-your-customer processes** to produce high-cost international revenue share calls through premium rate numbers and services.

## National Roaming

In some countries with many operators like India, this is a very common type of roaming. In 2015, Pebble Network launched in the UK which allows national roaming across all major UK networks.

There's no doubt that national roaming could offer great benefits to the end user such as increased connectivity, speed and stability. But the reconciliation process is still too lengthy and expensive in most cases.



# Roaming On Blockchain

Blockchain brings the roaming relationships between mobile operators on a single blockchain network. A cryptographically secured and immutable shared ledger acts as a single source of truth for operators, enabling direct exchange of information. Authorization, reconciliation and settlement happens through transactions, executed based on a consensus model and automatically enforced through smart contracts.

## Roaming Agreements & Smart Contracts

Roaming agreements are encoded into smart contracts onto the blockchain network. Smart contracts are computer programs that are deployed on the blockchain network and execute exactly as programmed, without the possibility of downtime.

Subscriber activity on a roaming network is registered onto the blockchain network through transactions and executed based on the smart contract roaming agreement between home operator and roaming operator, instantly resolving charges and avoiding involvement of third parties such as clearinghouses.

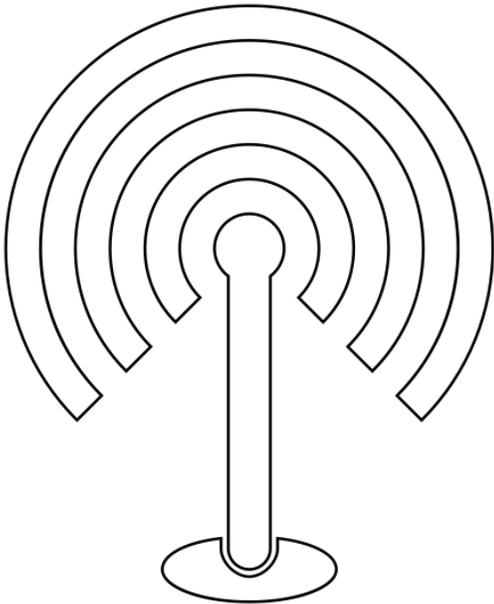
Direct exchange of information allows home operators direct insight into the usage information of their roaming subscribers, allowing them to send usage limit notifications. The roaming rates for the subscriber are then automatically updated in the smart contract based on the subscriber's plan and usage.

## Identity Management & Fraud

With a shared historical ledger and direct exchange of information between home operator and roaming operator, subscriber identification and authorization can happen quickly when entering new cell territory.

Spoofed or cloned subscribers can easily be identified and flagged as fraudulent across the network when they try to go through the authorization phase since operators are part of a network.

It could be even taken a step further by the use of embedded-SIM cards instead of traditional SIM cards. These eSIMs would contain a public-private keypair instead of an IMSI.

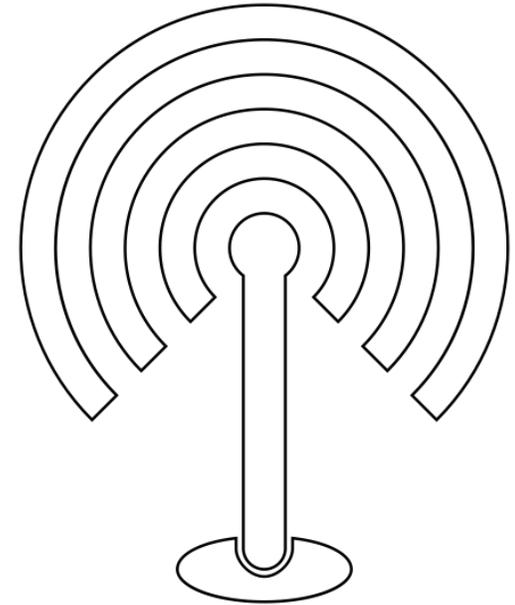


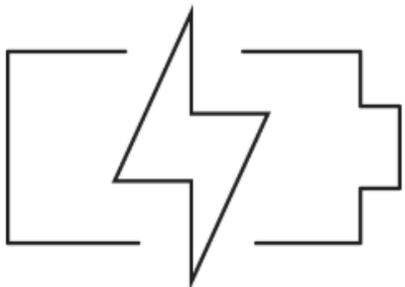
Public-private cryptography is key to blockchain technology as it allows for signing and verifying transactions. The public key is used to identify a subscriber on the network and known by all operators through the shared history.

The private key is tied to the subscriber's device and is never shared. It is used to sign the subscriber's transactions to the blockchain network. It is mathematically improbable to forge or clone a random private key, disallowing any possibility for identity theft.

### **Sharing Infrastructure Costs & 5G**

The blockchain network allows operators, especially on a national level, to share the cost of masts, antennas and maintenance through roaming agreements. Less infrastructure would need to be built to realize ubiquitous access to mobile networks and the eventual enablement of 5G.





**Less than 5% of roaming subscribers use more than 80% of data consumption**

## **Over 70% of users disable roaming**

Most users disable roaming when they go abroad due to the high costs involved.



**\$6.3 billion**

The total losses to roaming fraud globally in 2018 amounted to \$6.3bn, the number has increased in recent years.



**Upward of \$650 million can be saved annually by eliminating third party clearing houses**

# SUMMED UP

The business value of blockchain

## **Settlement & Billing**

Automatically enforced smart contracts between operators enables near-instantaneous disclosure of call data and resolution of charges, eliminating third-party clearinghouses.

Shared data on a blockchain network allows disclosed operators to have better insight into a subscriber's usage information and overage limits

## **Transparency**

An unforgeable history of verifiable transactions allows easy dispute resolution and enables trust relationships.

## **Fraud & Identity Management**

The shared transactions on the blockchain networks allows operators to have increased visibility on subscribers in the roaming network. Fraudulent actions can easily be identified and flagged to warn other operators.

Automatically enforceable contracts for authorization of subscribers can make it much harder for SIM or MSIDN cloning to take place.

# CONTACT US

And let's improve roaming together,  
one block at a time.

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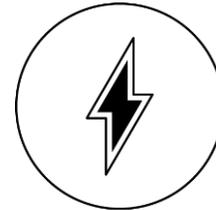
[nico.vergauwen@designisdead.com](mailto:nico.vergauwen@designisdead.com)



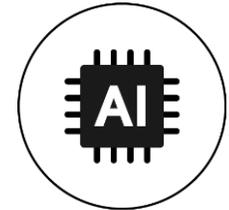
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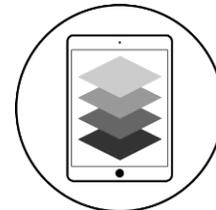
# AGILE GUIDES IN DIGITAL JOURNEYS



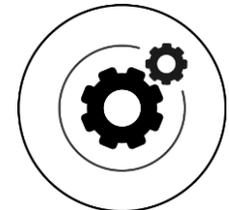
Enable Business Agility



Provide Actionable Insights



Activate Digital Customers



Continuous Automation