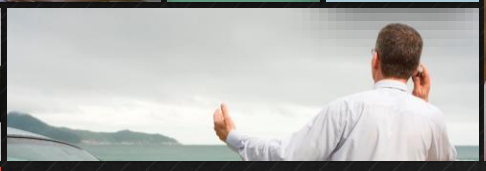
Phone

Message



Mobile

4

Telecommunications

BSS/OSS Blockchain

Commercial Data Chain Compliance w/
Telecom Commercial Communication
Customer Preference Regulation - 2018

Internet

There is potential for Blockchain to remove intermediaries, or otherwise reduce business-process friction where centralised functions act as bottlenecks.

Powered By – Blockcube Limited
Blockcube is a Blockchain Technology Research, Development and Consulting Firm.

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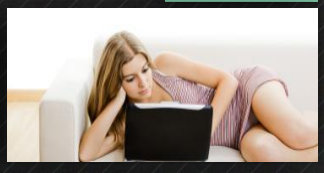
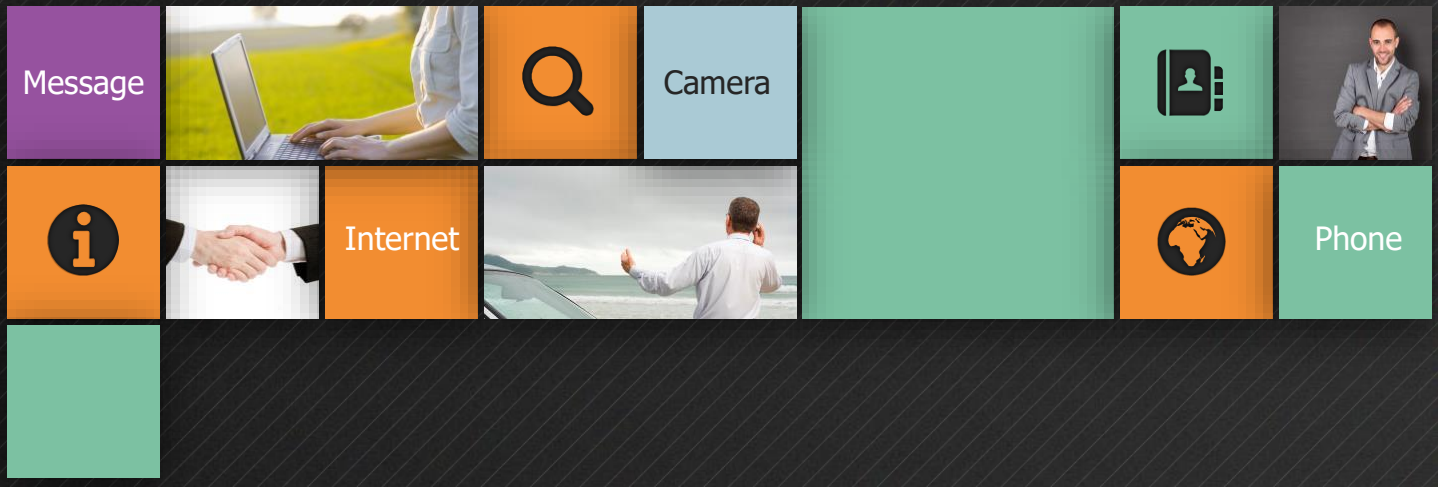
Camera

Blockcube is one of the leading Blockchain Research and Consulting company with 8+ years experience. We build, train, advise and research.





What's Inside

Consulting

We are harnessing the power of Blockchain technology to revolutionize the everyday world. We provide Blockchain powered solutions to major industry players.

Research

We create the transformational technologies and expertise to operationalize intelligent decisions w.r.t. Blockchain.

Analytics

Using the latest in research technologies, we uncover rich insights so our clients can make more informed decisions.

01. Decentralization

The Dawn of Blockchain in Telecom

DLT refers to a novel and fast-evolving approach to recording and sharing data across multiple data stores (or ledgers). This technology allows for transactions and data to be recorded, shared, and synchronized across a distributed network of different network participants.

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Telecom Management

Blockchain Impacts on Telecom Industries

India is reported to be world's most spam call plagued country with over 26.2 spam calls / month / user. There is lot more that needs to be done. Lets take a look at the Telcos.

01. Telecom on Blockchain

"Blockchain in Telecom" ecosystem provides direct interaction between end-users, mobile operators and servi ce-providers via smart contracts. It eliminates hundreds of intermediators, dramatically reduces costs of mobil e services), and saves years and millions of $$ on implementation of the ineffective roaming technology.

01. Spam Reduction

Blockchain disable the spam calling and SMS from telemarketers and operator to the users.

02. Fraud Management

Blockchain has the potential to reduce losses due to fraud and minimize costs for fraud detection applications.

03. Partners Management

Network, Enterprise, customers and partners can be manage on single distributed ledger called Blockchain.

04. BSS & OSS on Blockchain

Blockchain efficiently handles various challenges involved in OSS/BSS processes such as portability, billing etc.

02. Upcoming Opportunities

Blockchain is currently one of the most widely-discussed and disrupt technologies. There are not many indust ries that shouldn't be either excited or worried about its potential, with use cases, proof-of-concepts, and Full fledged businesses based on blockchain technology emerging at an increasing pace.

Identity- as -a -Service

It Provide eSIM solution and identity and authentication services based on cryptography identity.

5G Enablement

Platform to enable next generation technology selection management required for 5G network potential.

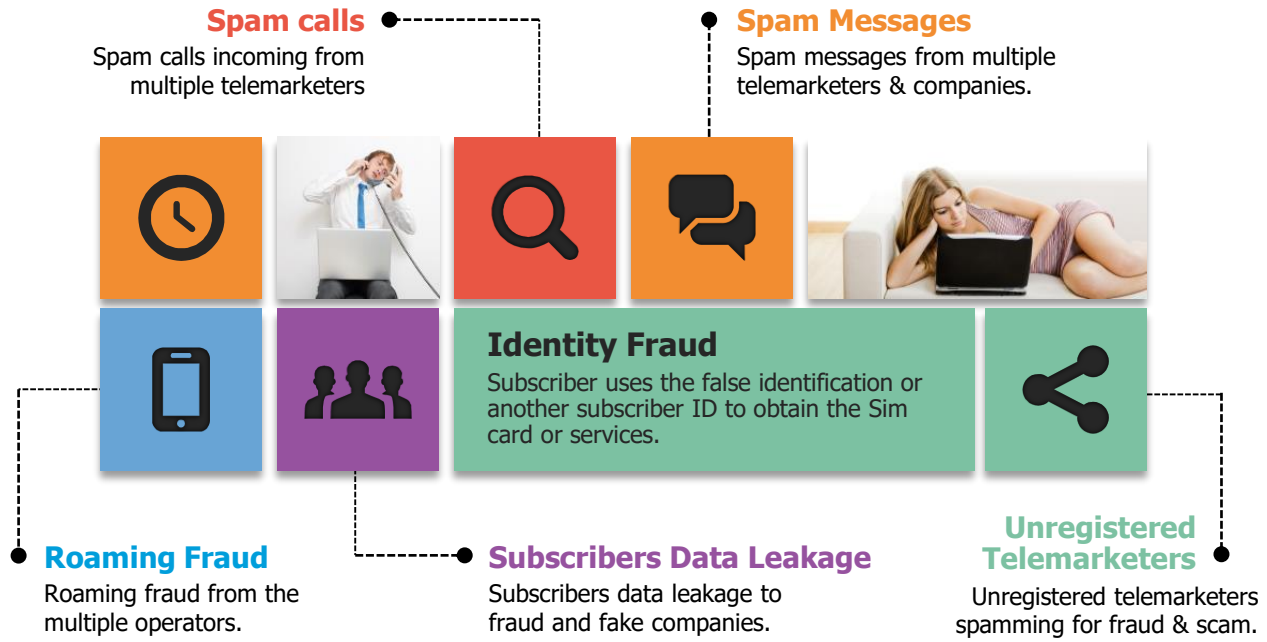
The Problems

Problems are not stop signs, they are guidelines.

"When a great team takes the ownership of its problems, the problems get solved. Which is true in businesses, battlefield etc." Why not take a look at problems at hand!?

03. Addressed Problems in Telecom

Fraud detection and prevention continue to be topics of relevance for most CSPs, as a result of fraud costs in the industry of over USD 68 billion globally annually. Given that the telecoms industry has not yet found a wa y to effectively and sustainably prevent fraud, blockchain is the only solution.



04. Challenges

Advancement in technology have completely altered the market landscape for the telecom industry. Advent of 4G, smartphones, mobile apps have changes the way people consume telecom services. However, such disruptive innovations are posing challenges for the telecom industries.

80%

Privacy & Security Issues

Telecom service providers maintain a la rge repository of personal data and sen sitive information. They are constantly under threat and vulnerable to hacking.

20%

IOT Integrations

Integration of IOT requires a higher level of connectivity & data flow , telecom players are facing challenges to develop a functional platform.

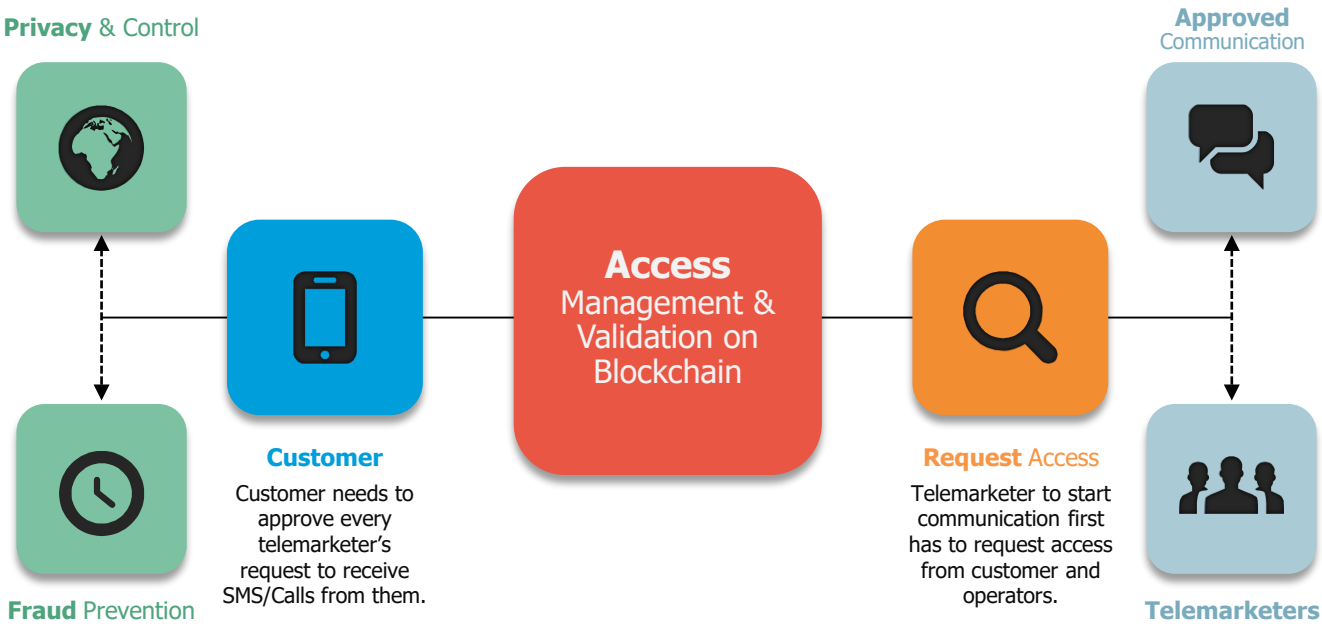
Telemarketers Compliance

Customers, Operators, Marketers and Regulators - All in One

We propose a double interfaced solution based on a Delegated Proof-of-Process Blockchain with Access Management, bringing the right to share private data in hands of customer.

05. How do we reduce spam?

1) All telemarketers request access from customers, only upon whose acceptance the telecom operator permits the marketer to connect. This mechanism ensure indisputable consent to indulge. 2) Customers get a access to a decentralized spam/crime/fraud reporting system which controls unsolicited telemarketers.



06. Main Interfaces

Both the interfaces can be connected to IVR/Help Codes and all other existing customer facing applications (web/mobile) using RPC Calls and REST APIs. This will facilitate customer interaction and feedback cycle for the telecom operators with any drastic changes and further initiate them for upcoming advancements.

01 Telemarketer Management

Customers will further never get calls or messages from the telemarketers. They will be able to although subscribe with a simple request, or by accepting the request raised by telemarketer specifically. Customers will also have the right to end the subscription at any point of time.

02 Fraud Prevention - Sidechain

Customers may report/mark calls/SMS as spam/fraud/crime, such a request will be push to a sidechain acting solely to process such malicious attempts. The other party need not be a telemarketer for this process to be initiated. The sidechain will also by accessible by Cyber Cell and Telecom Ops.

Regulatory Management

Blockchain as a RegTech

Blockchain provides an ex-ante enforcement of technical rules, thereby reinforcing the opportunities of regulation by code and the corresponding legal implications it might entail.

07. Spam Compliance Management – Proof of Process Validity

Proof of Process is our Patent Pending Technology that enables supervisors to trust a typical process by disassociating the proof of data from the real source information in a way that yields a solitary proof that can guarantee the process. PoP guarantees TRAI that's designated spam compliance is abided.

Trustless Authenticity

With Zero Knowledge Proof on the blockchain's Proof of Process ensures the validity of all signatures with their authorizations.

Immutable Structure

We use IPFS to make ensure data safety, alongside blockchain based immutable and irrevocable records which ensure no breaches exist.

08. Systemic Oversight

Telecom operations are really complex and there are a lot of trust issues and transparency challenges due to the involvement of multiple entities, and no clear mechanism to track end-to-end activities of every entity. This makes monitoring really difficult for TRAI in case of frauds/spams and other mismanagements.

01 **Access to Spam Sidechain**

The Spam Sidechain being a repository of all reported mobile numbers, the actions against the report can be tracked by TRAI designated official through a specified TRAI Access Portal. Regulators will have end-to-end visibility over the actions by telecom operators in such cases.

02 **Supervision of Operators**

Use of Blockchain, Proof of Process and IPFS the process set in place will ensure better results and result in more efficient process management and fraud control. TRAI Access Portal will let regulators analyze process risk better. TRAI will also be able to control which nodes have the right to validate blocks.

This will form a component of the sidechain, and gives customers the transparent opportunity to report unsolicited communication.

09. Fraud/Spam Reporting System

This add-on system will be used for reporting of unsolicited communication, without which spam control seems difficult as per our opinion. FRS is intended to be a repository of spammers. The system will use EVM based irrevocable public auditable smart contracts as an alternate to Remote Process Automation.

Fraud Detection	**Smart** Contracts	**Augmented Behavior**
Fraud/Ponzi Scheme or any other Cyber Crime when reported at Telecom ops discretion forwarded to Cyber Cell.		Telecom Operators and Cyber Cell Authorities can take actions as per the law, caller ID will be blocked forever.
Unsolicited Call Report if processed but no wrongdoing is concluded.		The caller will be allowed to access the system again and cleared from Sidechain.
Unsolicited Telemarketer when reported will be scrutinized and found guilty.		Telemarketer will be blocked out of the network and associated KYC will be reported.

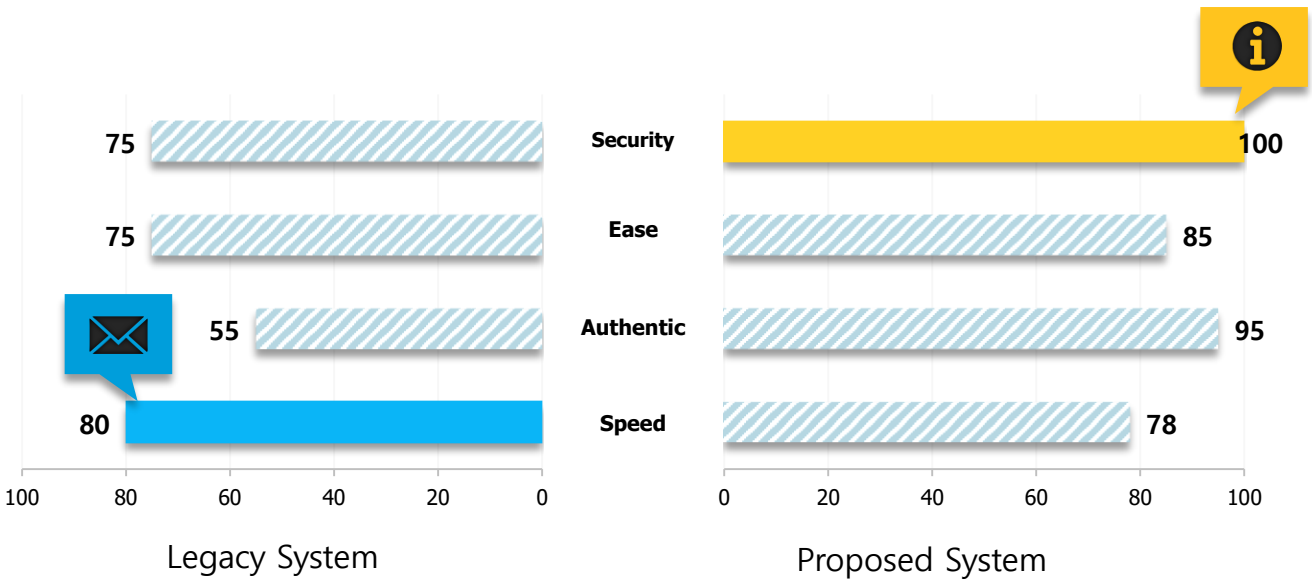
10. Report Processing

The Smart Contracts will also create a transparent auditable distributed ledger accessible by other telecoms as well as TRAI. The reports in certain cases may also acts a indisputable timestamped proof by cyber cell as an evidence.

Delegated Proof of Process is our Patent Pending Consensus algorithm which is used to create fault tolerance and efficiency between the distributed nodes. We use Private Key Containerization to ensure customer safety.

11. Technology Behind the Product

We use IPFS for versioned data sharing, C++ and Python forms the backbone of the Blockchain, over which NodeJs is used to create easy-to-use APIs and a Remote Procedural Call (RPC) Layer. The UI/UX is designed to ensure the learning curve for usability is short lived.



12. Blockchain – Delegated Proof of Process

We use a specialized Proof of Process based permissioned Blockchain, where every transaction corresponds to either a contact access request being authorized, or declined. Every transaction will correspond to a uniquely identifiable transaction hash which will act as a Zero Knowledge Proof of the authenticity.

01. Block Validation

Block Validation in the proposed product will be made by the delegated block validation system put in place. The regulators with multi-signature accounts will only have the authority to add, append or update a block validator node. This eliminates possibility of 51% attack. Once the set of transactions are processed out of memory pool, and block validator has a valid Nonce, block is signed and broadcasted.

02. Rules of the Blockchain

Blockchain will restrict double entry, transaction will need to be timestamped and signed by all digital parties involved, ensuring the preset proof of process, no transaction involving a side chain address is permitted on the mainnet.
The mainnet access control can only be controlled from the preset seed node, with all pre-defined multi-signature inputs to ensure safety and efficient block processing.

02. Market Segment

Sentiment & Grievance Segmentation

Telecom industry today has the most complex operations framework, involving many partners, vendors, customers, distributors, network providers, VAS providers.

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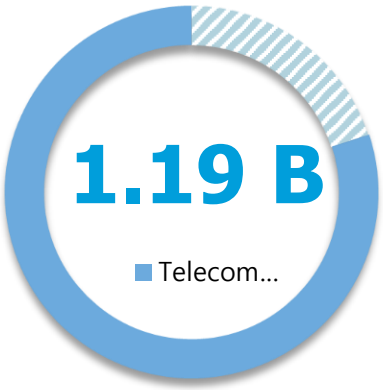
Telecom Market

Brief Market Analysis

Telecoms now are struggling to find new sources of value, while simultaneously reining in costs for providing traditional services.

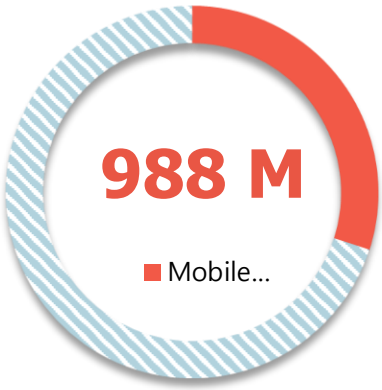
01. Spamming in Indian Telecom

The main motivation for spamming is commercial profit. The costs for sending millions of spam mail message s are very low. In order to make good profit, it suffices, if only a very small fraction (0.1 % or even less) of th e sent out spam are replied to and lead to business transactions.



Telecom Subscriber

Total telecom subscribers in India is 1.19 B out of 1.38 B population



Mobile device subscriber

Total mobile device subscribers in India is 988 M out of 1.19 B telecom subscribers

02. Spam classification

When we compare the clusters to the types of spam identified by the GSMA , we find a close correspondence to the three main types which are described as:

01. SMS Spam

SMS Spam, where unsolicited text messages are sent to su bscribers for mass advertising and social engineering viral h oaxes. SMS spam become the major problems in India.

02. Premium Rate fraud

premium rate fraud which is s ending unsolicited text messa ges that trick subscribers into calling premium rate number s or signing up for subscriptio n services that are charged.

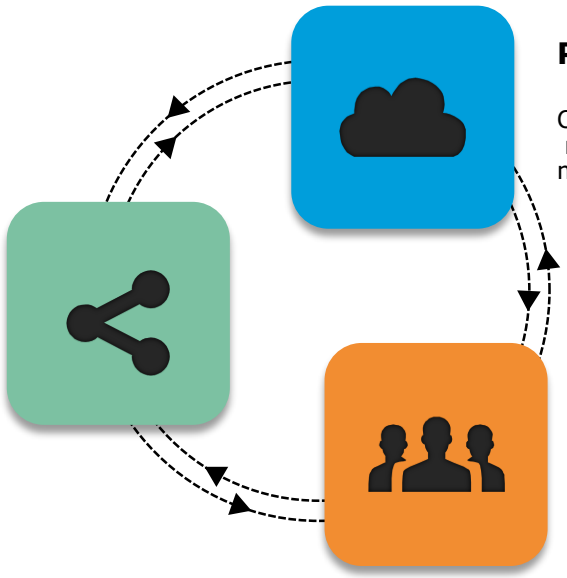
03. Phishing/Smishing

Phishing/Smishing which is se nding unsolicited text messag es asking subscribers to call c ertain numbers to extract con fidential information, which is then used for other purposes.

There are a lot of trust issues and transparency challenges due to the involvement of multiple entities, and no clear mechanism to track end-to-end activities of every entity.

03. Spam Segmentation Analysis

With the goal of analysing and identifying different categories of SMS spam, we have performed a clustering experiment on the corpus presented in the previous section. The raw documents were parsed and processed according to the standard unigram-based text clustering practices.



Phishing/Smishing

13.0% of the messages. Considering the reported rise in phishing and smishing attacks in recent time

SMS Spam

The ringtones and competitions clusters can be categorised as SMS spam and account for **32.4%** of the messages.

Premium rate fraud

clusters claims, prizes, voice mail, dating, and chat, and accounts for **43.9%** of the messages.

04. TRAI as member of spam organization

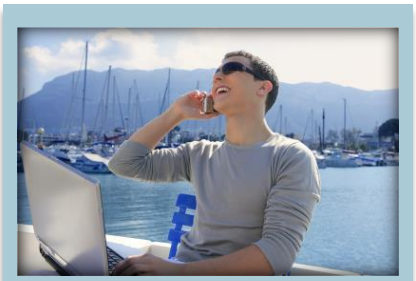
TRAI issued The Telecom Unsolicited Commercial Communication Regulations 2007 for regulating unsolicited communication under section 11 of the Act. These regulations only address unsolicited commercial communication over the telecom system. . Now in 2018 regulates to shift on blockchain to prevent spam.

India is a member Asia Pacific Coalition against Unsolicited Commercial Email ('APCAUCE') CAUCE is the world's largest volunteer anti spam organization, with groups in the USA, Canada, the EU and the Asia Pac region APCAUCE activities include: **1.** Technical tutorials and conferences; **2**. Speakers include technologists, ISPs, blocklist operators and lawmakers; **3.** Annual "Regional Update" meetings that bring together regulators, governments, ISP associations and interested citizens from around the region at an informal round table discussion of anti spam laws and initiatives in the region; and **4.** Contribution of public policy papers on spam.

A blockchain's 'enabled' trust improves coordination between various partners, due to a shared view of transactions and liabilities.

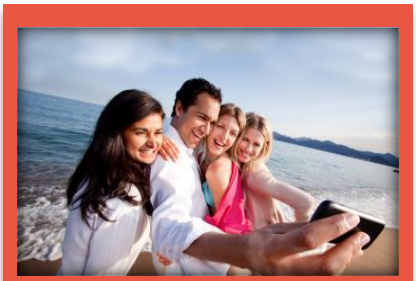
05. Upcoming Trends & Opportunity in Telecom

Blockchain is currently one of the most widely-discussed and hyped technologies. There are not many industries that shouldn't be either excited or worried about its potential, with use cases, proof-of-concepts, and full fledged businesses based on blockchain technology emerging at an increasing pace.



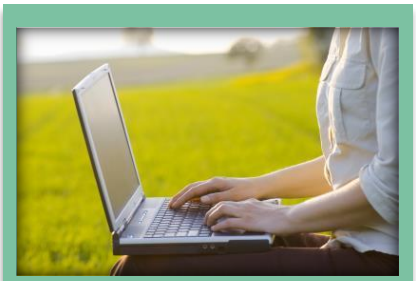
5G Enablement

Rules and agreements between the various access providing networks can be coded as smart contracts. These contracts can be dynamic in nature



IOT Connectivity

A blockchain can enable secure and error free peer-to-peer connectivity for thousands of IoT devices with cost-efficient self-managed networks



Data Management

CSPs can create new sources of revenue by providing identity and authentication as well as data management solutions to partners, enabled by blockchain.

02. Power of Blockchain

The benefits of adopting a blockchain in the core and auxiliary operations of a Communications Service Provider are plenty, as highlighted above. CSPs should take a long term view of blockchains and their potential to add value to the enterprise in both their current and new business models.

01 **Model of Revenue Generation**

Potential to facilitate new business models for revenue generation for Communication Service Provider who are looking for new avenues to increase both top and bottom lines. Optimisation of the BSS using remote process automation based on Blockchain, will boost the growth.

02 **Smart Contracts in OSS**

Implementation of smart contracts in roaming and other cases allows for near-instantaneous charging, thus leading to improved revenue assurance and fraud reduction. Smart Contracts and Machine Learning will lead to optimised automated operational management.

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