

Disruptive Analysis of opportunities for block chain And Distributed Ledgers in Telecom Industry

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Abstract – Block chain technology has huge opportunities in many industries and contexts. To a large degree, its trajectory will be driven by sectors like Financial services, international shipping and healthcare. But that will bring along telecoms with it – and there are also numerous signs of “grassroots” effort by the communications industry, especially when linked to new areas such as IoT. This fragmentation of effort also means that multiple vendors, integrators and block chain platforms (private, but also potentially public block chains) are likely to be relevant.

Keywords- Block chain, Smart Contracts, Micropayments, Data Integrity etc.

I. INTRODUCTION

The expression "Block chain" has as of late ascended to noticeable quality over the innovation business. Initially utilized as the basic innovation underneath Bit coin, there has been a lot of work transforming the idea into a more broad method for safely putting away and getting to information, crosswise over appropriated systems, without the requirement for focal mediators.

By giving an approach to databases to "self-confirm" their own precision, and to forestall altering, many trust that square chains will be a centre part of future IT frameworks – and may even change the manner in which that business and society characterize "trust" all the more extensively. And the Bit coin square chain, there are presently numerous different digital forms of money, record innovations, and stages to make them. Ethereal is a standout amongst the most essential, as it enables designers to make tweaked square chains for specific open or private ("permissioned") utilize cases. The Hyper record Consortium is quick getting to be one of the main open-source ventures for big business review square chains.

Be that as it may, as of not long ago the standard telecoms industry has for the most part seen the area from far off, possibly similarly as a visual cue on a slide about R&D activities or futurism. This is presently evolving. There is a developing acknowledgment – crosswise over numerous modern parts – that some genuine utilize cases for disseminated records (the "official" general term for a wide range of blockchains) are beginning to take shape. And keeping in mind that a significant part of the emphasis has been on the money related administrations segment, and maybe medicinal services and worldwide exchange, there is likewise an expanding sum going ahead in telecoms, as well as nearby regions like system security, distributed computing and IoT.

II. BACKGROUND WHAT ARE TELCOS' UNDERLYING MOTIVATIONS

Correspondence Service Providers (CSPs) of assorted types – settled and versatile administrators, link suppliers, discount transporters and others – are attempting to discover new wellsprings of significant worth, while at the same time getting control over expenses for giving customary administrations. They likewise confront advancing control, in addition to quick turnover in innovations, which focused progression some of the time constrain into the market before the last emphasis has been completely monetised.

Two expansive arrangements of patterns are happening:

- **Costs**- A profound spotlight on costs, robotization, and profitability, by taking "erosion" out of existing resources, tasks and outside connections. This ties in with "softwareisation" of systems in the types of NFV and SDN, and utilizing outsiders as administration and stage suppliers, moving CapEx to Opex. These shifts often require re-surveying conventional sellers and mediators, and utilizing new stages, money related models and information streams to oversee connections.
- **Revenues**- A proceeded with mission by CSPs to search out new administration openings, especially where these emerge from purchaser Internet applications and substance, or particular undertaking "verticals" that are seeing major mechanical unrests. Such regions are appropriate to new participants, and may permit more prominent separation than customary commoditised telecom administrations. A considerable lot of these regions, once more, bring new prerequisites for creating, putting away or sharing information – for instance around instalments, IoT information administration, or substance right

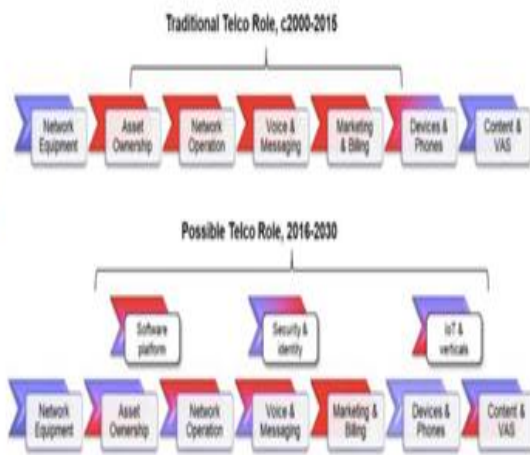


Fig.1 Telecom operators are seeking new role and revenue opportunities.

On the cost side, there is potential for block chain to expel go-betweens, or generally lessen business-process contact where brought together capacities go about as bottlenecks. Conveyed records may likewise adjust better to other decentralized capacities and abilities, for example, edge-figuring or the craving to deal with some security capacities as near the end-client as could be expected under the circumstances.

For new administrations and income openings, Telcos are taking a gander at fast, modest, advancement and administration creation cycles. This puts a premium on utilizing lightweight innovation parts, augmenting mechanization, and keeping away from complex usage and mix ventures, for capacities like charging and administration.

Administrators are additionally creating specialty answers for industry "verticals, for example, medicinal services, e-government, transportation, "Industry 4.0" assembling, or open wellbeing. These will regularly have altogether different arrangements of items, directions and organization settings to customary telcos and the system/interchanges items might be utilized to evade inheritance structures in those enterprises.

For instance, power supply is changing from brought together colossal power-stations and solid matrices, to disseminated sun powered and wind control age, "feed-in" from end-clients, and likely limited stockpiling in future. This will require new types of (secure) system and correspondence to control – a potential open door for Telcos on the off chance that they can adjust their benefits (e.g.4G/5G range and systems) to this exceptionally specific commercial centre. They are searching for devices and accomplices that may assist them with competing in this, and numerous other, evolving end-client areas. A noteworthy relevant pattern is that all businesses will install systems and interchanges work

profoundly into their structures. While some can utilize bland Telco availability offers, others will require more attentive, modified variations. Some portion of the test will manage new esteem chains and partner gatherings, while thinking about elective installment/bookkeeping techniques to conventional Telco memberships.

While block chain isn't the main response to these issues, it is likely that a portion of the new administration openings can misuse systems "empowered by circulated trust".

III.CATEGORISING BLOCKCHAIN USE-CASES

A central challenge of discussing block chain in a telecoms context is that there are so many possible uses and applications. If you consider the huge number of existing instances of databases and storage, that might be replaced or improved with distributed ledgers, you start to recognize the scope.

Then add the immense diversity of new service domains, plus the ways the current architectures might be evolved, and the problem swiftly becomes intractable. Should operators have a central "block chain strategy" driven from the CTO's office? Or is it best seen as a pervasive trend that cuts across organizational silos, and will likely emerge in numerous diverse instances?

To counter this complexity, Disruptive Analysis has developed a series of tools that help companies in the telecom sector categorise and prioritise - the block chain opportunities, and consider where in their organizations they are best addressed. The two most important are:

A matrix of possible "intersections" between generic functions of block chains, and the operational domains within a stereotypical CSPA description of the possible stakeholder groups that may be relevant for any potential block chain use-case. The matrix maps generic "horizontal" uses of block chain (which broadly apply to any industry) against functional domains within typical Telcos (network, content, cloud etc). The "horizontal" use-cases that Disruptive Analysis expects from distributed ledgers include:

- **Data integrity protection-** Essentially "anti-tamper" for data records, to prove there have been no covert changes made, between data creation, storage and access. Providing a "chain of trust" for data is likely to be ever more important as software and AI systems start to allow for easier "fake" information of all types to be created
- **Micropayments-**The roots of block chain are in crypto currencies, especially Bit coin. For Telcos, we should expect to see both existing public coin types used to pay for services (e.g. content such as music tracks), and potentially new and specialized tokens for things like peer-to-peer sharing of network capacity.

Telcos could also potentially become payment-as-a-service providers for verticals. One possibility is a way of storing very small micropayments for later bulk settlement, rather than incurring the transaction costs of dealing with each individually in real time.

- Disintermediation**-This refers to the use of block chain to remove existing central authorities or intermediaries. While telecom doesn't have the multi-layered settlement processes seen in some parts of finance or international trade/shipping, there are still areas such as roaming, Wi-Fi offload and content/app partnerships where third parties are involved and generate extra costs.
- Data inspection**- This refers to the ability to keep data "in escrow" in situations where there are non-trusting partners, in order to allow select instances of external visibility. For example, a third-party VNF provider might want to check usage records for their software instances, used within another vendor's orchestration framework.
- Registries**-These are long-term databases where information changes perhaps only in months or years. Some use commercial providers, or industry associations, to keep track of certain variables. These could potentially be replaced with distributed ledgers. For example, a future number-portability database could use a block chain, to reduce lookup / transaction costs of using a third-party database administrator. More interestingly, this might enable new registry-type operations, for example shared-spectrum usage rights and allocation.
- Smart Contracts**- One of the most interesting general use-cases for block chain is "computational law", or "smart contracts". Basically this involves encoding legal agreements directly into software, so that they execute (and settle) automatically, based on specified conditions being met.
- Asset Management**-Slightly overlapping with other categories, this relates to the ability to encode ("hash") large chunks of digital information, such as media content or bulk data, directly into a block chain itself. This allows such assets' distribution to be controlled, as well as ensuring they cannot be easily changed.
- Identity Management**- Public block chains enable new ways to create and assert unique identities, for example creating digital versions of passports or financial account data.

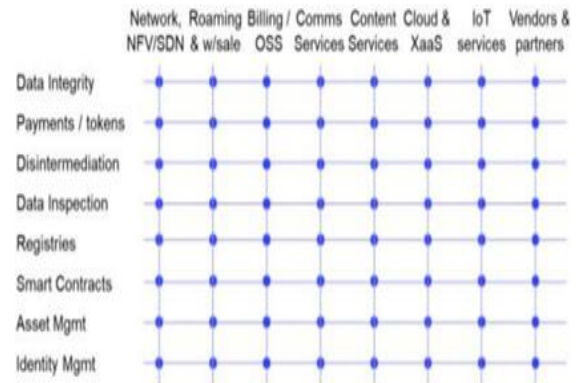


Fig.2 Block chain use cases may appear in Numerous Telco intersection point.

IV.CONCLUSIONS AND RECOMMENDATIONS

Overall, block chain technology has huge opportunities in many industries and contexts. It is also in danger of being over-hyped by some of its more enthusiastic advocates. To a large degree, its trajectory will be driven by sectors outside telecoms. Financial services, international shipping and healthcare are probably leading at present, and getting large shares of investment and attention.

This mirrors general trends towards what Disruptive Analysis calls "Telco Futurism" – the blending of traditional telecoms concepts, networks and value-chains with a broad set of adjacent enablers. Blockchain, AI, robotics, AR/VR, sensor technologies, new payment vectors and many other developments are impinging on telecoms – often in diffuse and unpredictable fashion

That said, development of block chain applications in telecoms is taking a rather different evolution path to, for example, AI. There are some big "framework" plays around telecoms AI, including massive shared "data lakes" relating to customer data, network status and other variables. These can help drive more-reliable operations, better planning and happier customers who are prepared to spend more. Conversely, interest in blockchain and distributed ledgers is (for now) much more dispersed. Individual projects and functions are looking at these as solutions for "point problems" – cheaper registries and databases, ways to secure identity, whether smart contracts could help create enforceable SLAs and so forth.

As such, it's harder to see Telcos developing a centralised, coherent "block chain strategy" – instead, it is going to be used tactically in specific niches, for the next 1-2 years at least. There will be a lot of pilots and prototypes – and each domain will also have a wide range of alternative options to consider. Data-integrity as-a-service could be an early winner for Telcos, in terms of

new service and also integrated into anti-tamper mechanisms for NFV and law-enforcement requests. There is also scope for various slow-moving registries and databases to transition to block chains, although regulatory issues may slow these.

We might see more strategic use in IoT in future, as that seems to be a focus of quite a lot of work. There is also strong interest from the OSS/BSS community in developing newer, low-footprint ways of managing and charging for telecoms services. The various token/coin approaches to shared resources are interesting, but have a lot of work to do, to live up to some advocates' utopian-seeming hype.

In terms of recommendations, Disruptive Analysis encourages Telcos and vendors to continue experimentation and prototyping blockchain-based concepts. The diversity of possibilities suggests that this responsibility should be devolved to many separate operating groups, ideally with visibility from the CTO's office but not heavy-handed control.

Market participants should also look at working groups within TM Forum, GSMA and other bodies in order to collaborate on real-world projects. Membership of Hyper ledger or other consortia is also an option – especially if there is scope to help start a telco-specific group or project.

Disruptive Analysis would also advise regulators and governments to assess if block chain makes certain new concepts more viable – for example whether spectrum policy could allow for better sharing of some bands, based on time/location, using a block chain-based way of recording allocations and usage rights.

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