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Why aren't telecoms blockchain use cases moving beyond the lab?

Dalia Adib - Principal Consultant, STL Partners

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Blockchain was promised provide benefits that solve problems in telecoms across a range of domains...

Identity/authentication
Managing identities and permissions for authentication or verification

- IoT device authentication for DDOS prevention
- Partner/vendor onboarding

Settlements
Revenue settlement by recording movement of goods/revenues or use of services/assets

- Edge computing licensing
- Roaming settlements
- SD WAN multi-vendor networks
- International carrier settlements
- Roaming settlements

Transactions
Enabling (real-time) payments and transactions

- Mobile money
- Automated IoT micropayments

Data tracking/registry
Recording information and data in an immutable way, whereby no party has asymmetric power over the data

- Supply chain mgmt.
- Telco credit scoring
- Media distribution authentication
- Electronic prescription delivery system
- Do not call registry

Data transfer
Enabling ease of transferring data to multiple parties

- Digital rights management
- Carrier marketplace
- Spectrum sharing mgmt.

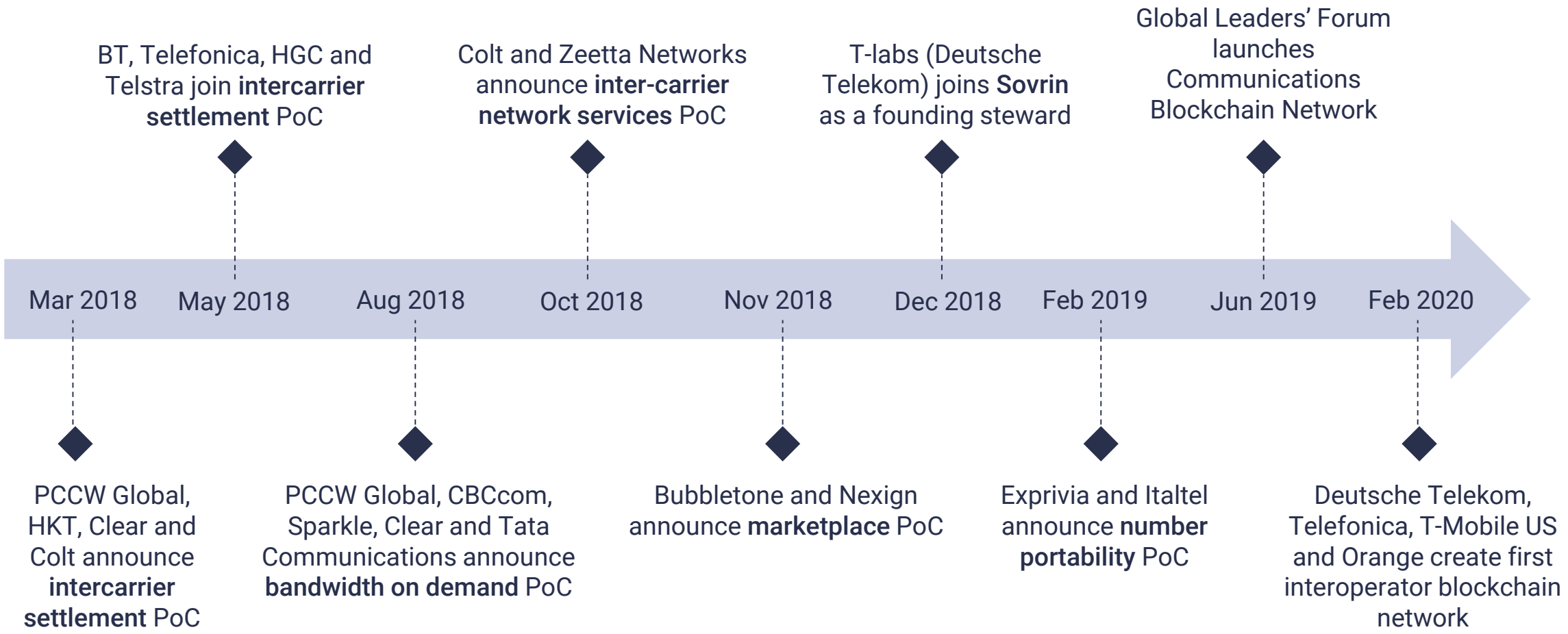
Token exchange
Virtual currency/tokens with intrinsic value

- Gaming

KEY
Revenue management
BSS
VAS

Networks
IoT
Other

...and telcos have been trying to collaborate and working together for a number of years...



...however, while PoCs for blockchain are becoming more prevalent, most telcos are still in the exploratory phase

Ideas / early stage → Actively exploring concept → Proof of concept

Use cases at each stage

Ideas / early stage

Tracking / registry
- Provision of medicine (supply chain)
- Procurement tender submission
- Using SIM cards as a private key to store sensitive transaction data

Identity / authentication
- Device verification
- Identity authentication
- Healthcare: electronic prescription delivery system

Transactions
- Cross-border payments

Actively exploring concept

Tracking / registry
- Agriculture supply chain tracking combined with IoT device management
- Tracking and verification of tenders between telcos
- IoT self-management of devices

Settlements
- Elimination of CDRs (roaming)
- Managed data on demand
- Grey routes and fraud
- Hybrid cloud orchestration

Identity / authentication
- Secure key delivery for IoT devices
- Identity management – know your customer
- Media distribution authentication
- Sovrin Wallet Android app

Token exchange
- Network data currency
- ICO for start-up investments

Data access / transfer
- B2C connectivity
- Decentralised rate exchange
- Independent music playlist management
- Smart home IoT

Transactions
- Mobile money for retail
- Ethereum tokens for network access

Proof of concept

Settlements
- International carrier settlement

Data access / transfer
- Carrier market place

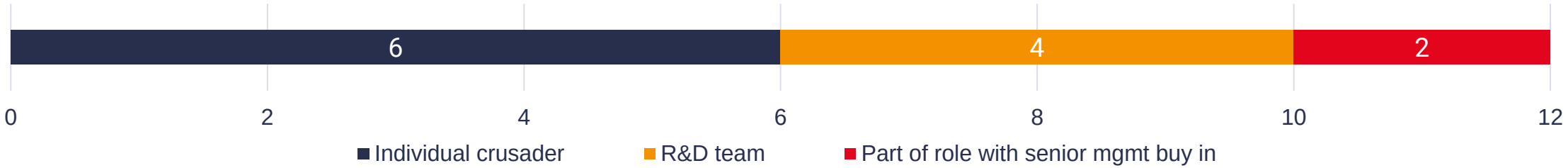
Other
- Sovrin stewardship

Most blockchain deployments out there are more hyped than reality

- Technology Insights Principal, APAC fixed & mobile CSP

Telcos should evaluate use cases at a business level to prevent them from staying in the lab

The majority of interviewees either had blockchain as a personal passion project or were part of R&D – senior management engagement was limited



In order to ensure that blockchain solutions become commercialised, telcos should consider the following factors:

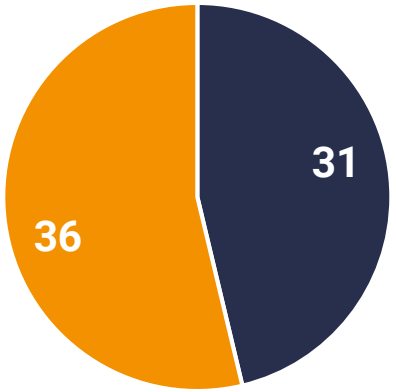
1. Key functionalities
2. Internal vs external use cases
3. Business drivers and benefits
4. Ease of implementation

1 Categorising use cases into key functionalities can provide direction to telcos looking to develop skills in a particular area

Type of functionality	Definition	Example use cases
Identity / authentication	Managing identities and permissions for authentication or verification	• IoT device authentication for DDOS prevention • Partner/vendor onboarding • Employee background verification
Settlements	Revenue settlement by recording movement of goods/revenues or use of services/assets	• Edge compute marketplace • Roaming settlements • International carrier settlement
Transactions	Enabling (real-time) payments and transactions	• Mobile money • Automated IoT micropayments
Tracking / registry	Recording information and data in an immutable way, whereby no party has asymmetric power over the data	• Supply chain management • Telco credit scoring • IMEI device fraud prevention • Do not call registry
Data access / transfer	Enabling ease of transferring data to multiple parties	• Inter-carrier network services • Number/KYC portability • Digital rights management
Token exchange	Virtual currency/tokens with intrinsic value	• Cross-retailer loyalty schemes • Gaming (e.g. in-game cryptotokens)

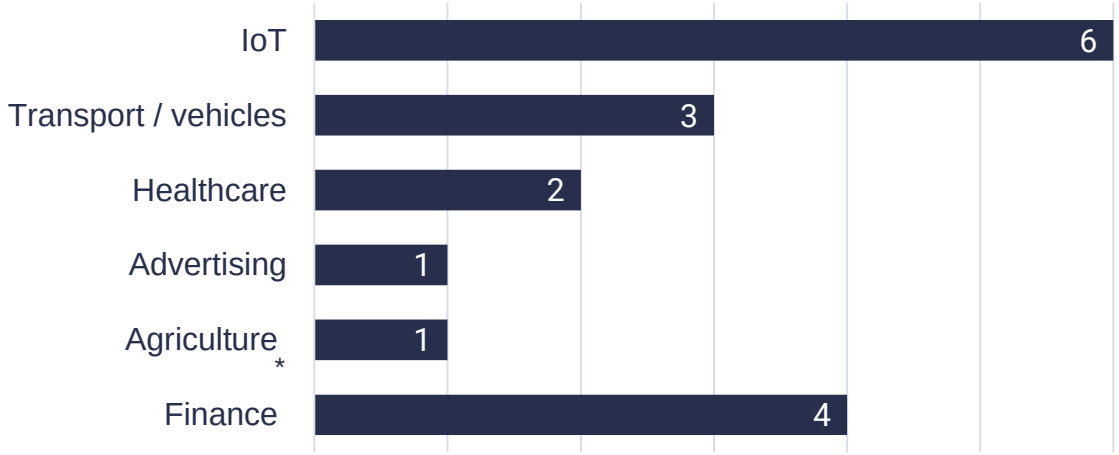
2 Telcos' decision to focus on internal or external use cases should align with their overall priority in implementing blockchain

Number of internal vs external use cases discussed during interview programme



- External facing use cases AKA something telcos would provide to others
- Internal facing use cases AKA something telcos would use themselves

The majority of examples for external opportunities was around IoT



*3 out of 4 Finance use cases were about mobile wallets

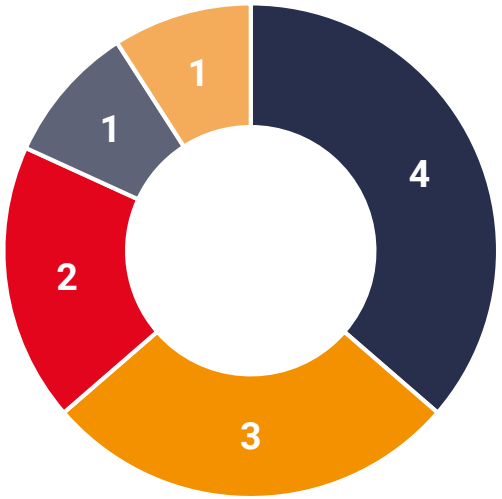
> *"I want to just say, why are we talking about blockchain? Because it is very successful in the financial sector, but we need to use the best of blockchain. So, the best in our use cases will be the financial sector, of course, it is already proven".*
>
> - North American Fixed & Mobile CSP

?!

Retail vs. wholesale external opportunities

3 Considering key business drivers may help telcos prioritise use cases: For most this is about growing revenues and automating processes

Most important business driver for implementing blockchain for each interviewee



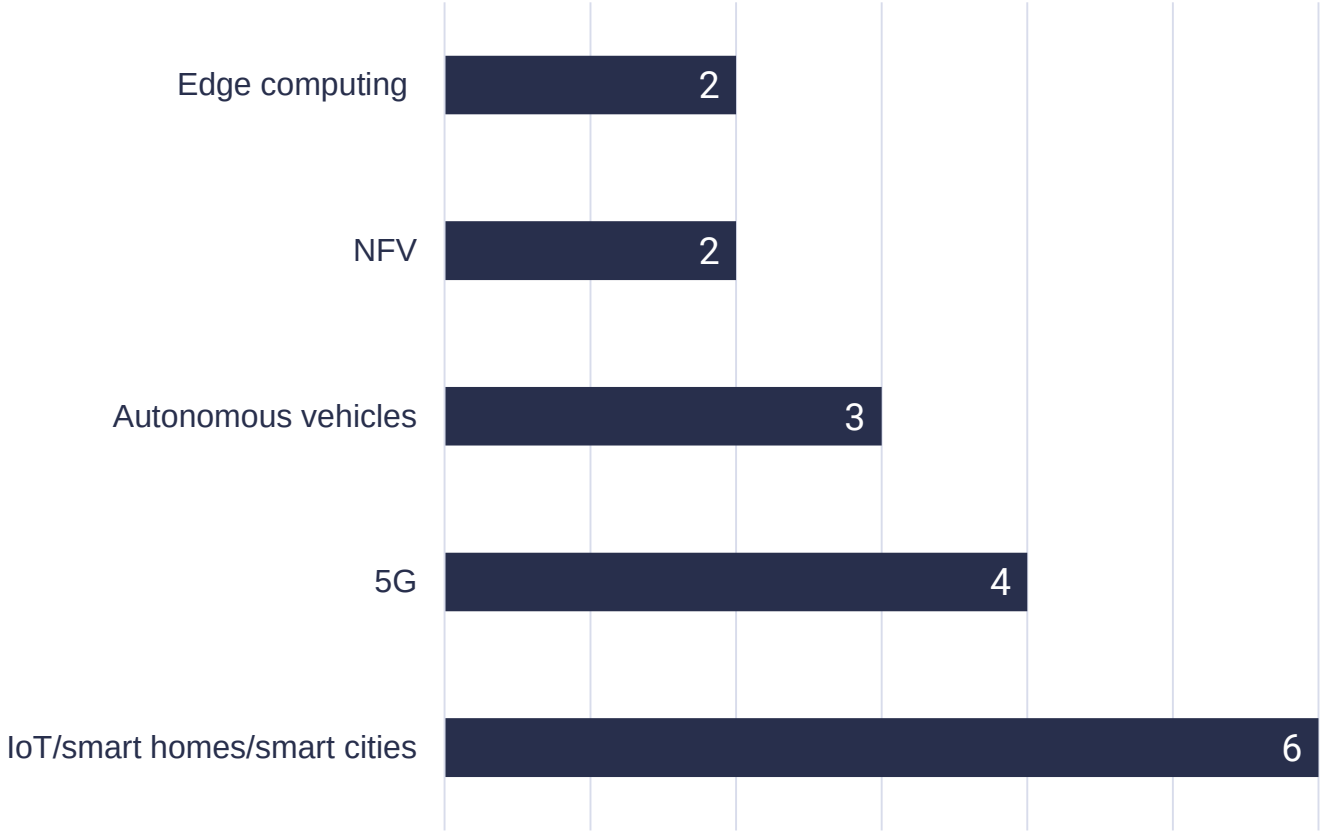
- Revenue
- Process automation
- Costs (removing intermediaries)
- Customer Experience
- Unclear

4 Telcos should also consider potential challenges, such as ease of implementation, when developing use cases

Challenge		Number of interviewed CSPs who identified as a challenge
Scalability	Duplication of computing on distributed nodes and the need for cryptographic ID proofs can pose scalability issues (easier with private permissioned).	6/11
Alternatives	Many use cases are not specific to blockchain and there are established alternatives today that are more mature and work adequately.	6/11
Technology maturity	Blockchain technology is still new and is constantly evolving, so not always suitable integrate it into live commercial deployments.	4/11
Regulation	Some regulation conflicts with blockchain and will take time to change, e.g. GDPR and right to be forgotten vs. immutable nature of blockchain.	3/11
Operator collaboration	Operators are competitive; large telcos often try to influence the market rather than be collaborative. Hence, consensus/governance is difficult.	3/11
Skills / expertise	There is a lack of skills in the telecoms industry for complex blockchain technology to be implemented in a non-costly manner.	2/11
Cost of replacing existing technology / systems	Blockchain has the potential to improve existing processes, but these may be linked to multiple legacy systems with a huge cost burden to change.	2/11
Usability	The usability of blockchain could be an issue both from the perspective of the developer and end-user of the solution.	1/11

4 The cost of migration from existing systems is making implementation too difficult – easier if greenfield

(Relatively) greenfield opportunities named explicitly



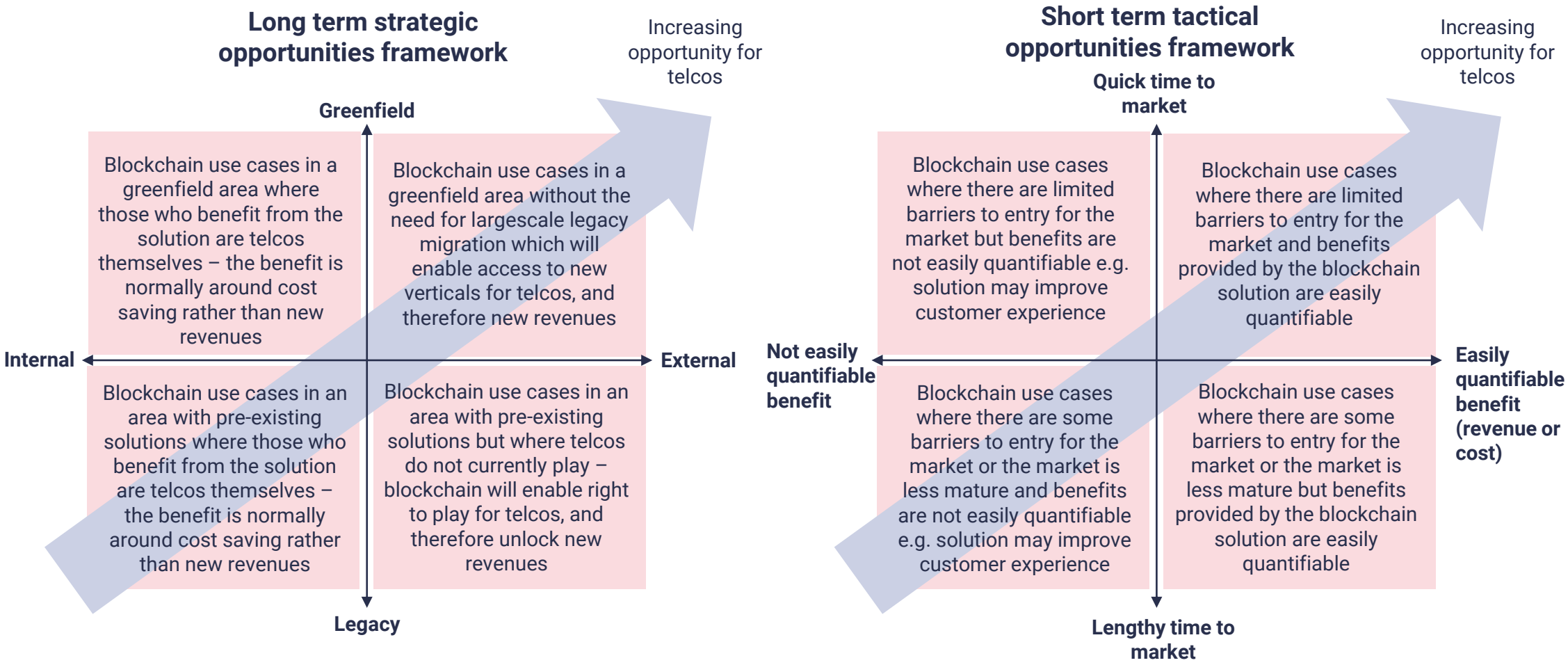
Highlighted comment

"I think the issue is that, coming from a telecoms background in North America, the legacy ways of doing things with centralised databases are both well understood and well capitalised, and certainly the infrastructure exists to do tens of thousands of transactions per second with current technology". *North American Fixed & Mobile CSP*

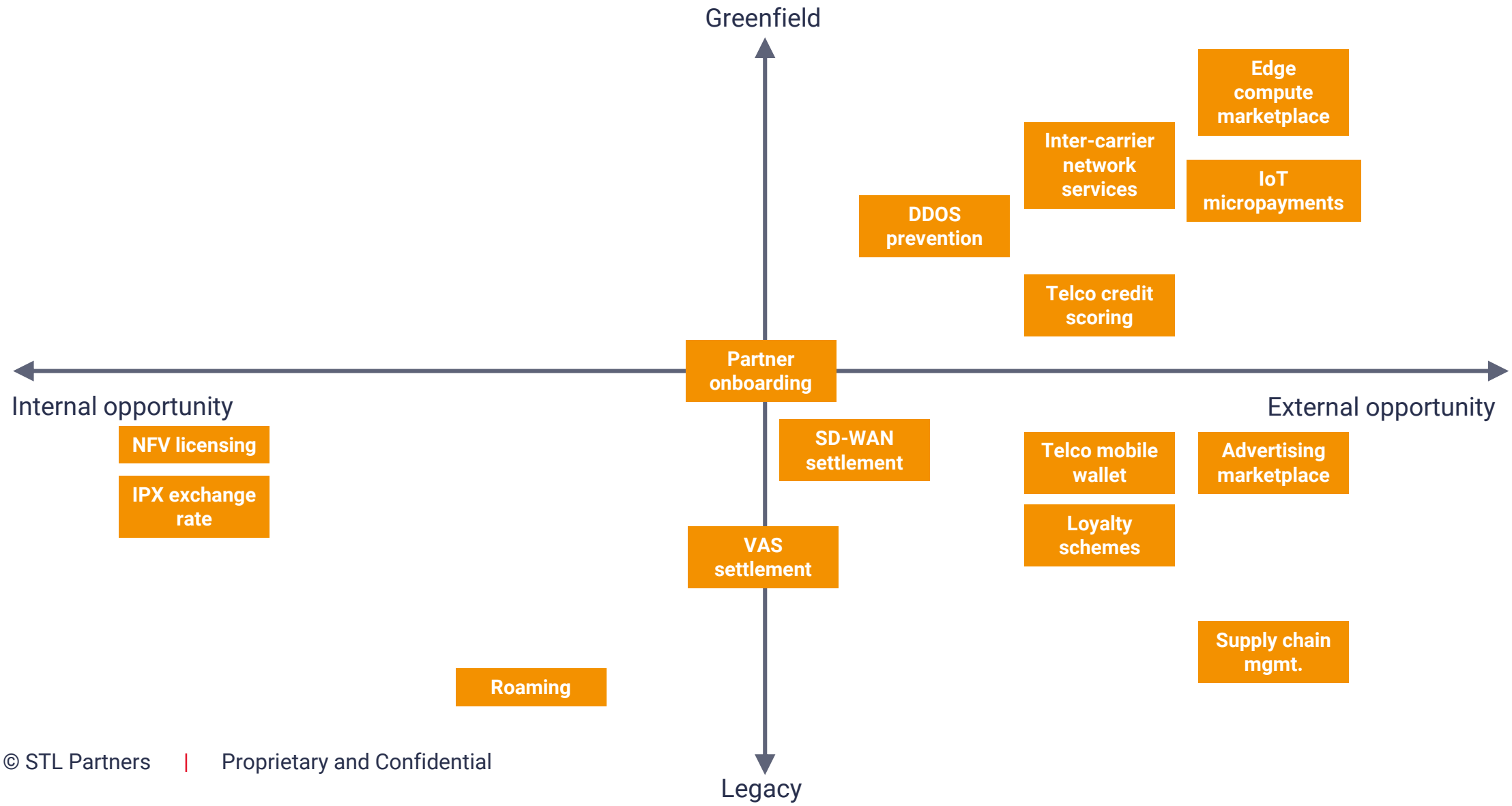
Highlighted comment

"There is maturity in the centralised database, a good centralised database, and the management of centralised databases, we lose in comparison to distributed blockchain architecture. The advantages of blockchain need to be doubled or three times higher than the advantages of a centralised database". *Western European Fixed & Mobile CSP*

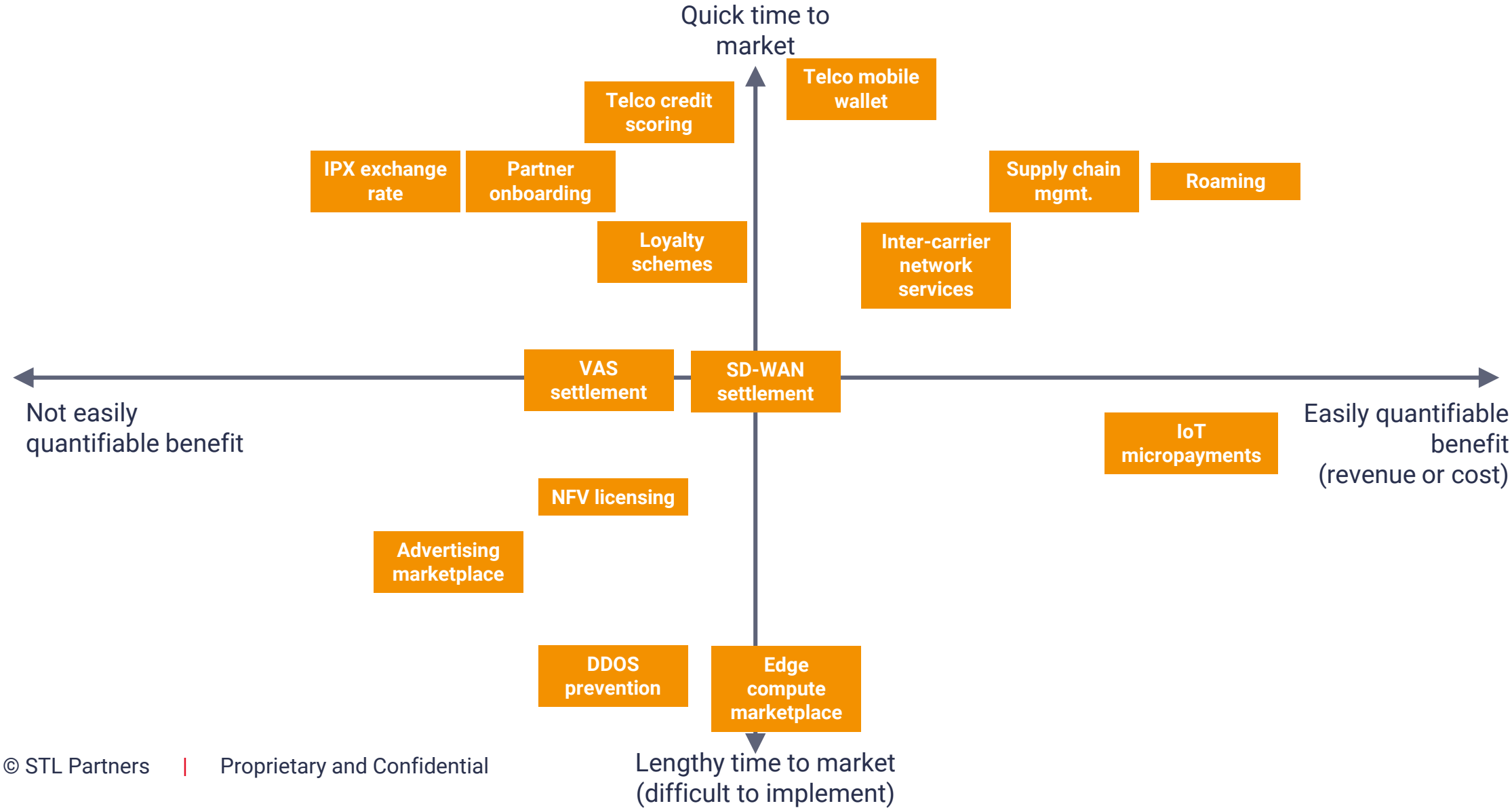
The most promising use cases for telcos will combine several of these factors



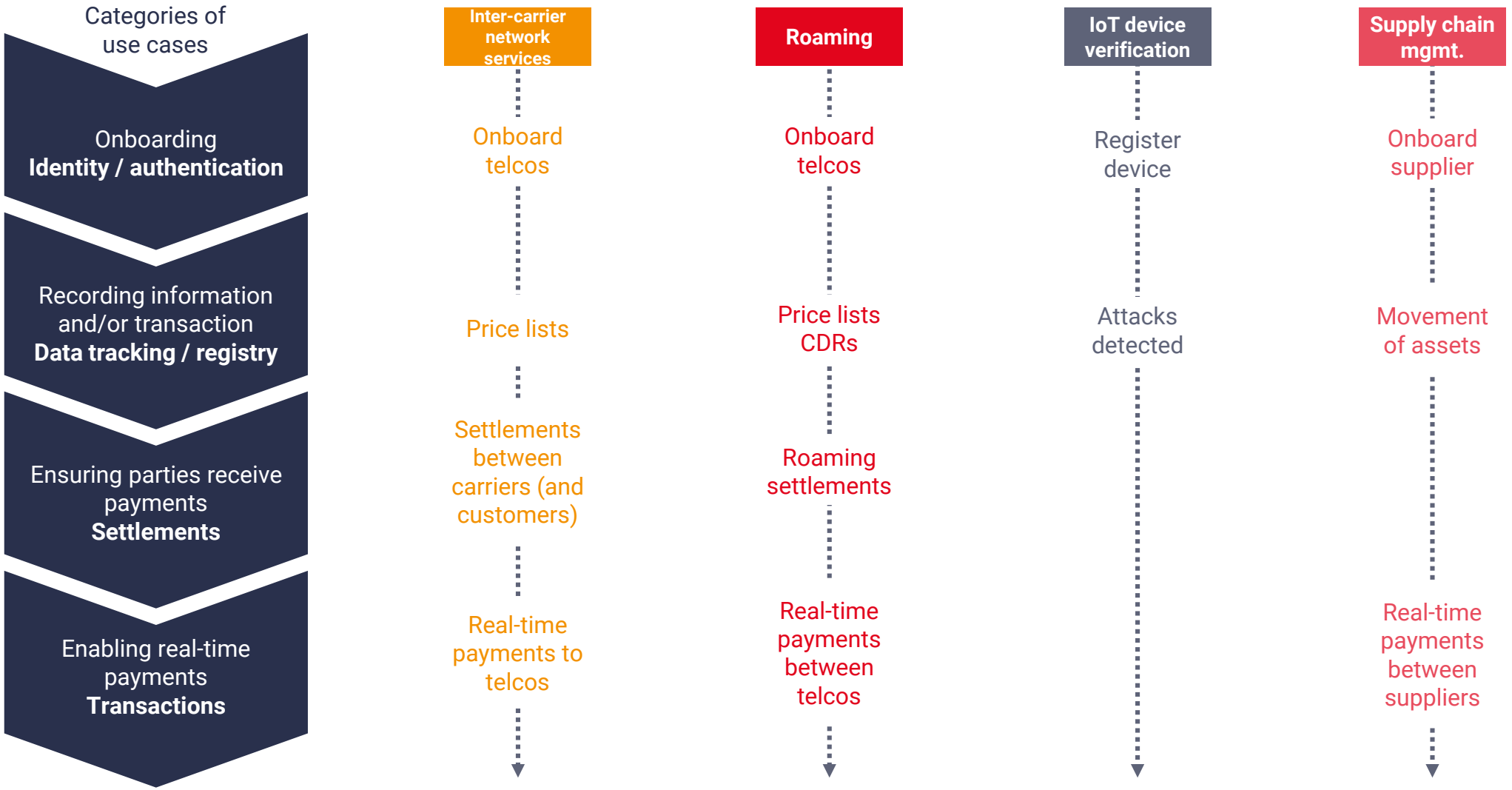
This framework compares use cases based on the type of business opportunity and existence of legacy systems...



...And here use cases are compared based on their time to market and ability to bring measurable business value



The truth is, telcos will start to leverage blockchain once solutions come to the market, rather than develop specific use cases



Within these, there are multiple roles and business models a telecoms operator could choose to pursue

END-USER	NODE OPERATOR	INFRASTRUCTURE PROVIDER	BLOCKCHAIN-AS-A-SERVICE	SOLUTION PROVIDER
Consumes blockchain services rather than actively participates in the blockchain system. The operator may still provide services that leverage the benefits of blockchain.	Run and operate a node on the distributed ledger to verify records and processes. Could be a miner (cryptocurrency) or participant / steward.	Provide members in the blockchain ecosystem the underlying compute infrastructure to operate nodes and related processes.	Platforms for customers (e.g. developers) to create their own blockchain-enabled solutions. These are likely to include the compute infrastructure.	End-to-end solutions; third parties plug into the blockchain ecosystem and the telco provides governance and/or managed services.
IBM Telcos in India plan to leverage blockchain registries for Do Not Call	sovrin Swisscom, Spark and other CSPs are Sovrin stewards	Azure Platform for simplified deployment onto its compute infrastructure	Deutsche Telekom T-Labs is prototyping a blockchain-as-a-service platform – hashstaX	TELSTRA Blockchain and biometric security smart home solutions

Conclusions

- The telecoms industry has been evaluating use cases for a number of years now, mostly in the lab
- A key issue is that this is often driven out of R&D / innovation
- Telcos need to bring blockchain POCs closer to the core business objectives to ensure they leave R&D stage
- And increasingly opting for ready-made solutions, rather than to focus on standalone use cases