LTIMindtree

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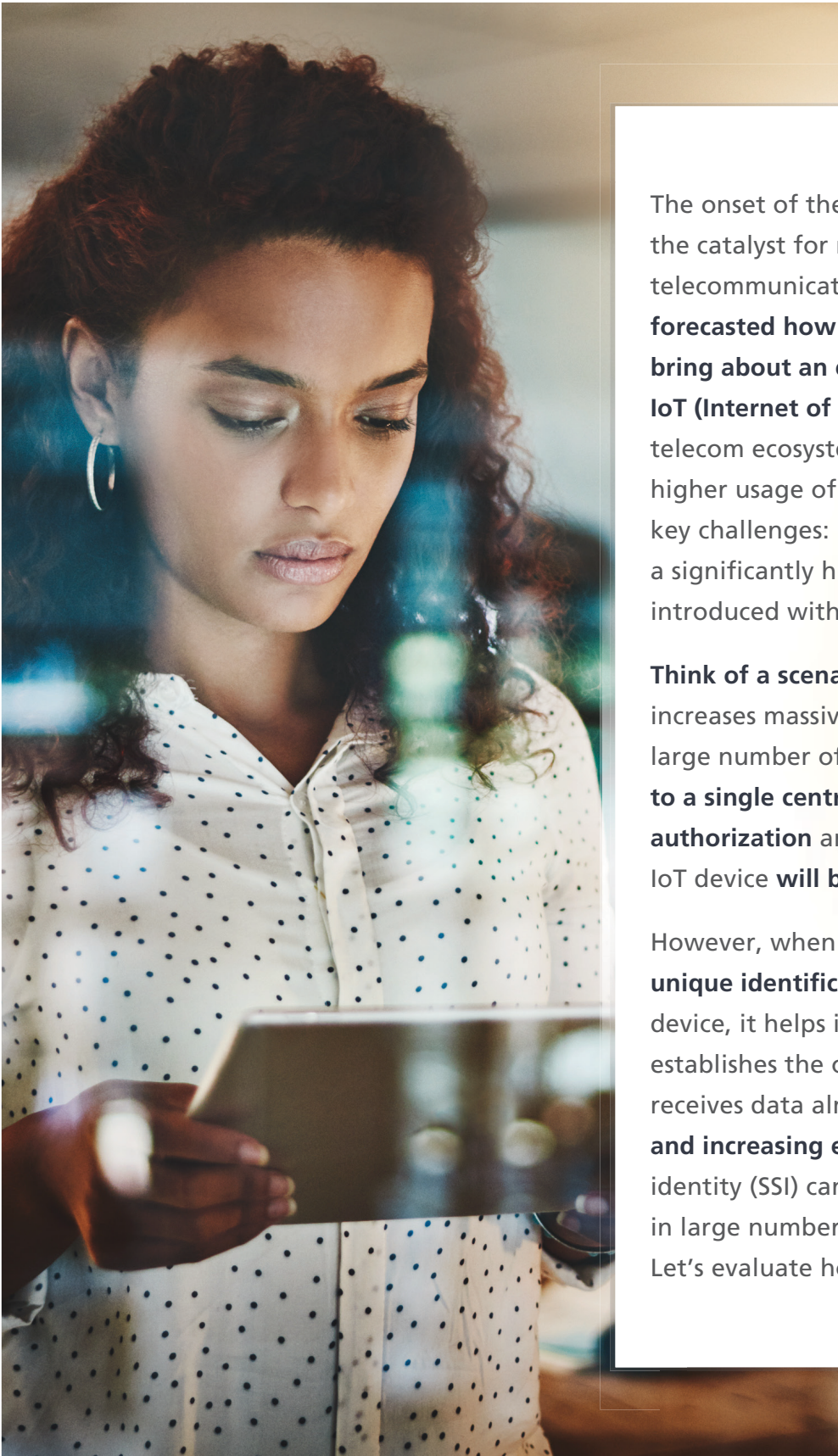
How blockchain could ease IoT implementation for telcos

The onset of the 5G network is poised to be the catalyst for next-gen telecommunications. **Experts have already forecasted how this disruptive 5G wave will bring about an explosion in the usage of IoT (Internet of Things) devices** in the telecom ecosystem—and beyond. The higher usage of IoT devices introduces two key challenges: Data handling and handling a significantly high number of IoT devices introduced within the ecosystem.

Think of a scenario: When the usage of IoT increases massively in the future, and a large number of **IoT devices are connected to a single centralized server, the authorization** and authentication of each IoT device **will be time-consuming and slow.**

However, when we assign a **global level unique identification number** to each IoT device, it helps identify the device quickly, establishes the connection faster, and receives data almost instantly**—saving time and increasing efficiency.** Self-sovereign identity (SSI) can help manage IoT devices in large numbers efficiently. Let's evaluate how!

Key challenges with IoT implementation and its recommended solutions

Problem	Solution
Secure federated devices	Use encryption and decryption process
Authorize and authenticate devices	Use security for high assurance
Security glitches	Enable patches managed by updates
Establish secure communication	Use TLS or DTLS communication
Data privacy and integrity risk	Use fingerprinting or encryption-based data
Secure web, mobile, and cloud applications	Use proper hub architecture
Ensuring high availability	Ensure un-interrupted data access for authorized users
Predict vulnerabilities and incidents	Detect, measure, manage and predict

Decentralized IoT system are the future

Currently, **the IoT ecosystems are architected as centralized server/client structure,** which is non-distributed. Hence, **it is connected and authenticated by a common server.** This model is not scalable and hence fails to effectively support or manage the ever-growing global demand for IoT devices. Therefore, **a decentralized IoT system model/architecture may be the right choice.** One of the most popular decentralized, distributed, tokenized, encrypted, and immutable platforms is blockchain. **Blockchain-based on the SSI platform is even more authentic.**
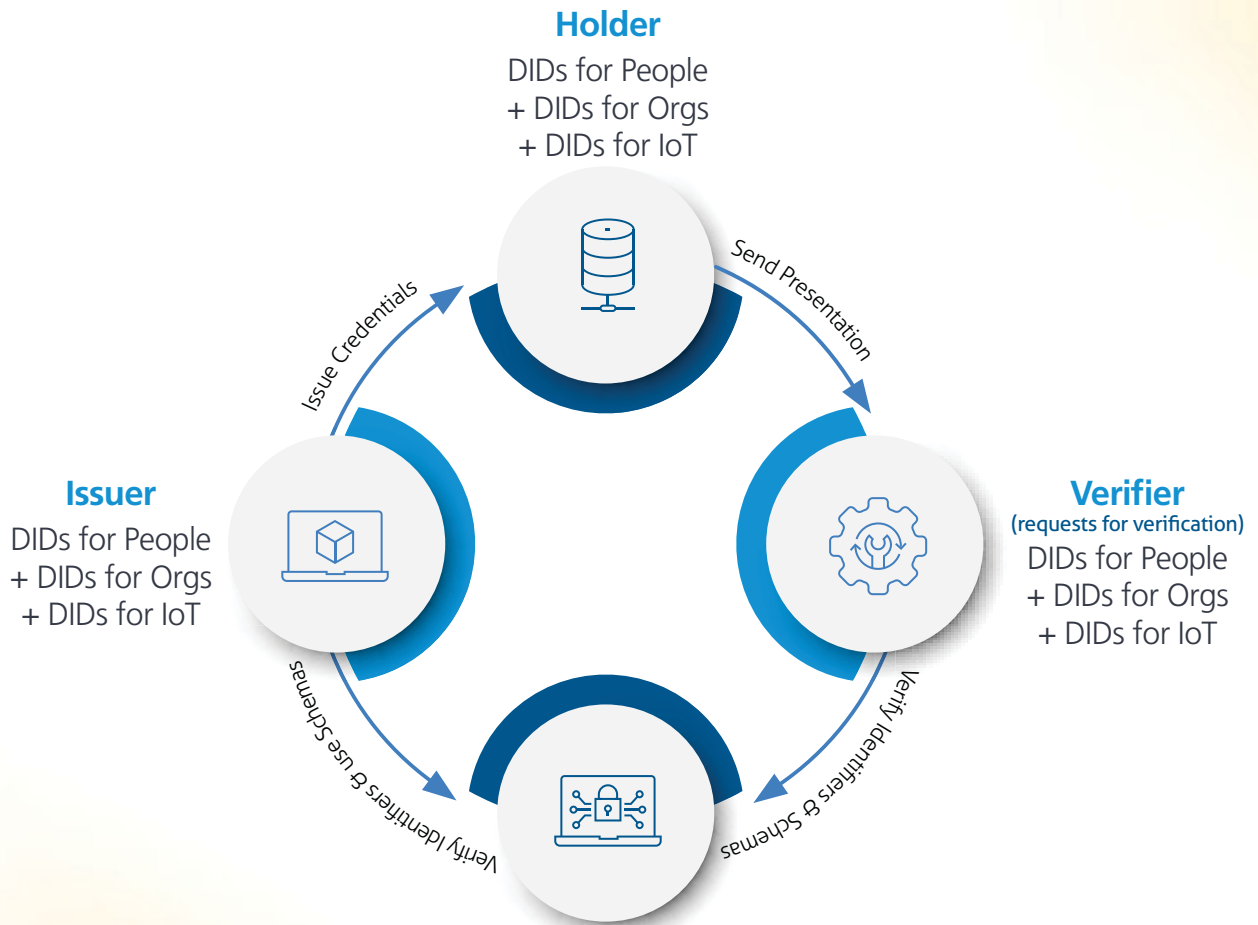
Why SSI in IoT?

The IoT is growing very fast. International Data Corporation (IDC) predicts that by 2025 around 55.7 billion IoT devices will be connected globally. Hence, a robust mechanism is required for scaling and securing networks to manage billions of IoT devices. For data security, we require a stringent access management framework that can be integrated and interoperated with the existing legacy systems. A unique identifier should be assigned to each IoT device, and a system that controls and manages access to the devices should be in place. Hence, SSI in IoT is needed now more than ever.

Defining self-sovereign identity

SSI creates a wrapper for the identity of things, which is enabled by key encryption methodologies and promotes low-cost compliance with GDPR, CCPA, etc. The identity of applications, data, and IoT devices is validated and verified by SSI, a decentralized model.

We propose using any distributed ledger framework (R3 Corda or Hyperledger Fabric along with Hyperledger Indy for the decentralized devices). **These two frameworks enable comprehensive IoT device ID and access management (IAM).**

Universally accepted SSI process framework

Holder
DIDs for People
+ DIDs for Orgs
+ DIDs for IoT

Issue Credentials

Send Presentation

Issuer
DIDs for People
+ DIDs for Orgs
+ DIDs for IoT

Verifier
(requests for verification)
DIDs for People
+ DIDs for Orgs
+ DIDs for IoT

Verify Identifiers & use Schemas

Verify Identifiers & Schemas

Blockchain-based Verifiable Data Registry
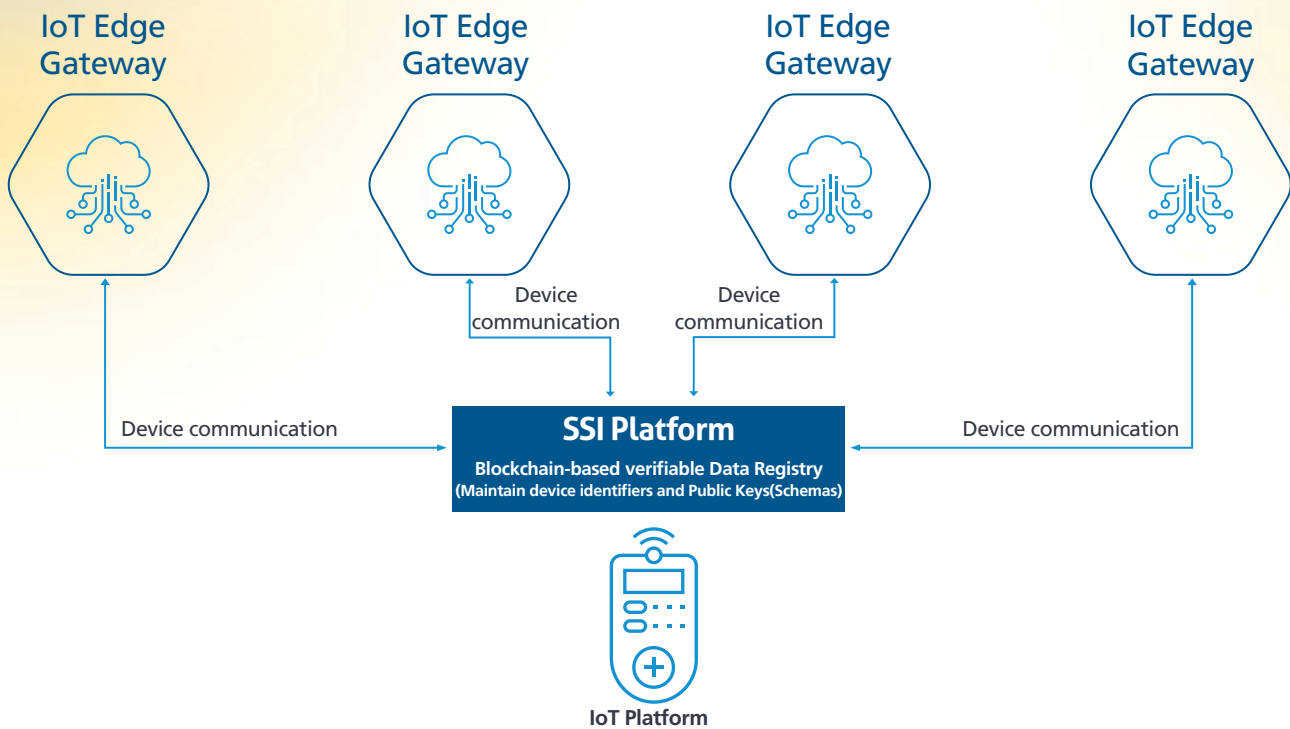(Maintain Identifiers & Public Keys(Schemas)

Quantifiable benefits of SSI to telcos

56%
Business efficiency and lowered costs

43%
Revenue Growth and Business Opportunities

37%
Improved Experience

High-level architecture overview of IoT ecosystem

IoT Edge Gateway

IoT Edge Gateway

IoT Edge Gateway

IoT Edge Gateway

Device communication

Device communication

Device communication

Device communication

SSI Platform

Blockchain-based verifiable Data Registry
(Maintain device identifiers and Public Keys(Schemas))

IoT Platform

IoT ecosystem and benefits of SSI

The IoT devices are provided with a specific key called Decentralized Identifier (DID) when the devices are onboarded on the system. This DID coordinates within the network to introduce the device to the receiver system before communicating between each other—reducing the authentication time. The immutability feature of blockchain and tokenization increases the assurance of secure and identified devices that establish communication with the IoT platform—thereby reduces the risk of credential-compromise factor.
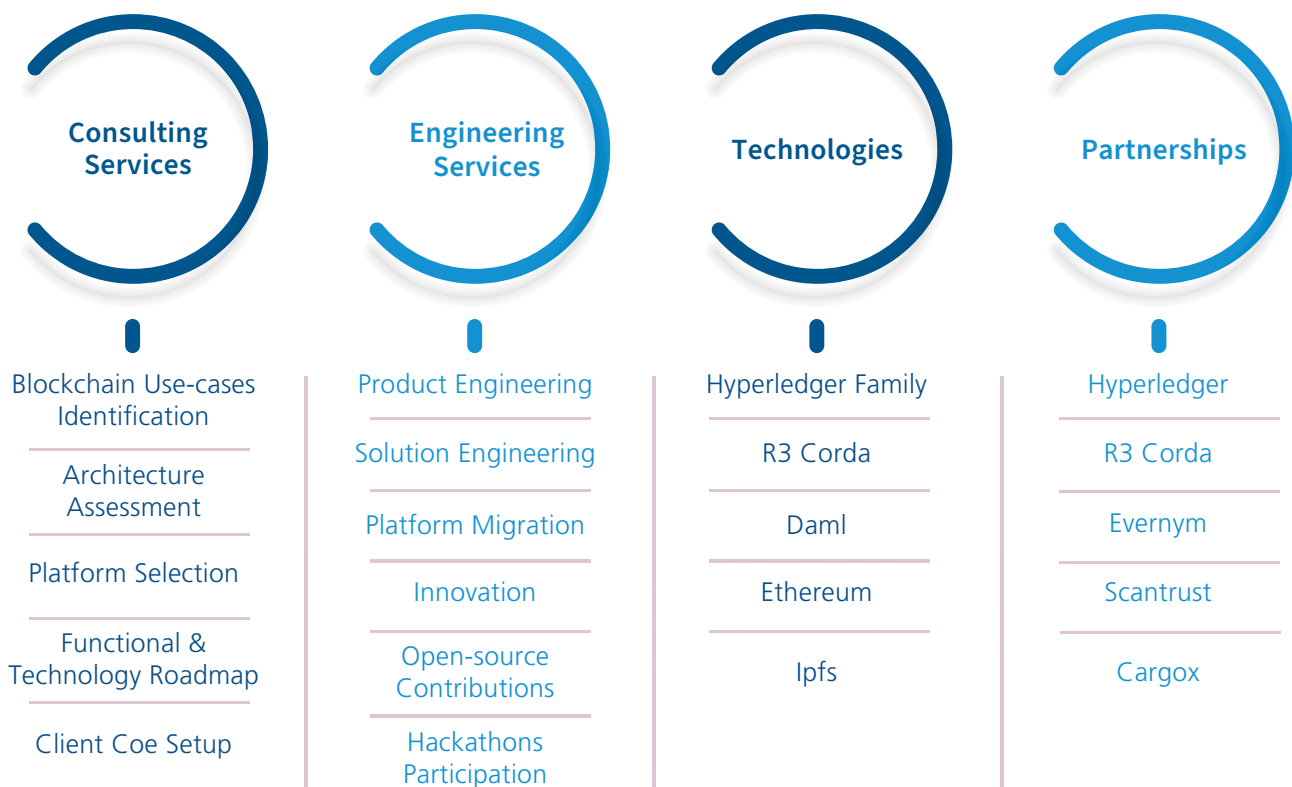
The potential SSI wrapper creates value for any organization, such as:

- Helps reduce operational costs

- Makes IoT networks faster by streamlining and optimizing IoT device lifecycle management.

- Reduces data liabilities and cybersecurity threats for diverse IoT devices and enables them to communicate securely.

- SSI enables new IoT ecosystems and higher value use cases based on the value of verifiable data and enhanced trust and security derived from deploying SSI.

The LTIMindtree blockchain practice

Our blockchain practice comes with a myriad of accelerators, frameworks, partnerships with the world's leading providers of blockchain frameworks. **Acting as a systems integrator, we collaborate with leading platform startups to propel the development and significantly reduces the go-to-market time** for any business prototype for clients. We provide the following blockchain services:

Consulting Services

- Blockchain Use-cases Identification
- Architecture Assessment
- Platform Selection
- Functional & Technology Roadmap
- Client Coe Setup

Engineering Services

- Product Engineering
- Solution Engineering
- Platform Migration
- Innovation
- Open-source Contributions
- Hackathons Participation

Technologies

- Hyperledger Family
- R3 Corda
- Daml
- Ethereum
- Ipfs

Partnerships

- Hyperledger
- R3 Corda
- Evernym
- Scantrust
- Cargox

As a proven fact, **we have partnered with an agro-tech startup in the U.S. Our Blockchain Practice architected, developed, and onboarded a track and trace blockchain platform f**or the client. After the platform went from production to live in 2019, IoT was added.

LTIMindtree for the communications industry

LTIMindtree provides digital engineering and innovation at scale to transform customer experiences for communication services providers (CSPs) in the 5G era. The telecom industry is at the forefront of transformation with the rollout of 5G across the world, and new possibilities of products and services have emerged with technology advancements delivered by 5G. OEMs and CSPs are looking to drive innovation. They continuously differentiate themselves through **investments in 5G solutions, AI-infused platforms, hyper-scale cloud-native services, edge computing, and IoT.**

LTIMindtree, born as a digital enterprise and a business transformation partner to Communication OEMs and Service Providers, has grown organically, building a solid core around at-scale digital services and engineering prowess. We understand the needs of our communication customers and have invested in the best of talent, solutions, and partner ecosystem to help across multiple dimensions: **product engineering, 4G/5G enablement, and reimagining customer experience. The communications industry is part of the communications, media, and technology (CMT) industry group at LTIMindtree.**

Conclusion

The digital disruptor, blockchain technology can also offer breathing space for many challenges in the 5G telecom world, such as **Roaming & settlements, Identity management, SLA monitoring, Prevention of Phone theft, Mobile number portability, etc.** Hence, blockchain technology's relevance for telecom operators and CSPs have moved beyond concept for day-to-day identified use-cases. However, **the ecosystem needs to take a strategy to evolve beyond the horizon around digital transformation and explore blockchain as an instrument to resolve pertinent problems and drive futuristic goals.**

References

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About LTIMindtree

LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 750 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by nearly 90,000 talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit www.ltimindtree.com.