

## **Synchronization of IoT Environment & Web 3.0: Immediate Challenges & Measures**

### **Central idea**

The Web3 is the most recent iteration on the internet. It is a paradigm shift that could fundamentally transform the way IoT businesses operate. A typical web-based app makes two major promises of IoT in web3: ownership and decentralization<sup>1</sup>.

This article will describe the positioning and impact of web3 in IoT as a network that runs an application on decentralized, community-powered networks and aims to give back ownership to its users (NFT, DAO & DeFi). This new trend shift opens up new opportunities for even existing web2-based IoT companies to redefine their value propositions, customer engagement strategies, and other business models. The use cases mentioned in the article could be the TRASNA's major innovation towards coming years.

### **Takeaways**

After reading the article, the reader can see the exact business benefit both technically and strategically for IoT based applications focusing system-on-chip (SoC).

### **Development**

Web3 is the most significant techno-commercial artifact, which interplays with Blockchain, crypto-currency & NFT to provide the end user as ownership of their assets. Most interesting part of IoT business to share the privilege of ownership and trust. In IoT, the architecture follows following **4 layers**:

1. **Service layer** (create & manage service to satisfy user needs).
2. **Sensing layer** (integration with hardware such as actuators, RFID & sensors).
3. **Interface layer** (provide interaction methods to users and applications).
4. **Networking layer** (networking & data transfer over wired and wireless networks).

In Blockchain, blocks can contain more information than the exchange of tokens and coins as achieved in crypto-currency interactions. Any data can be recorded immutably and distributed fashion<sup>2</sup> in connected device.

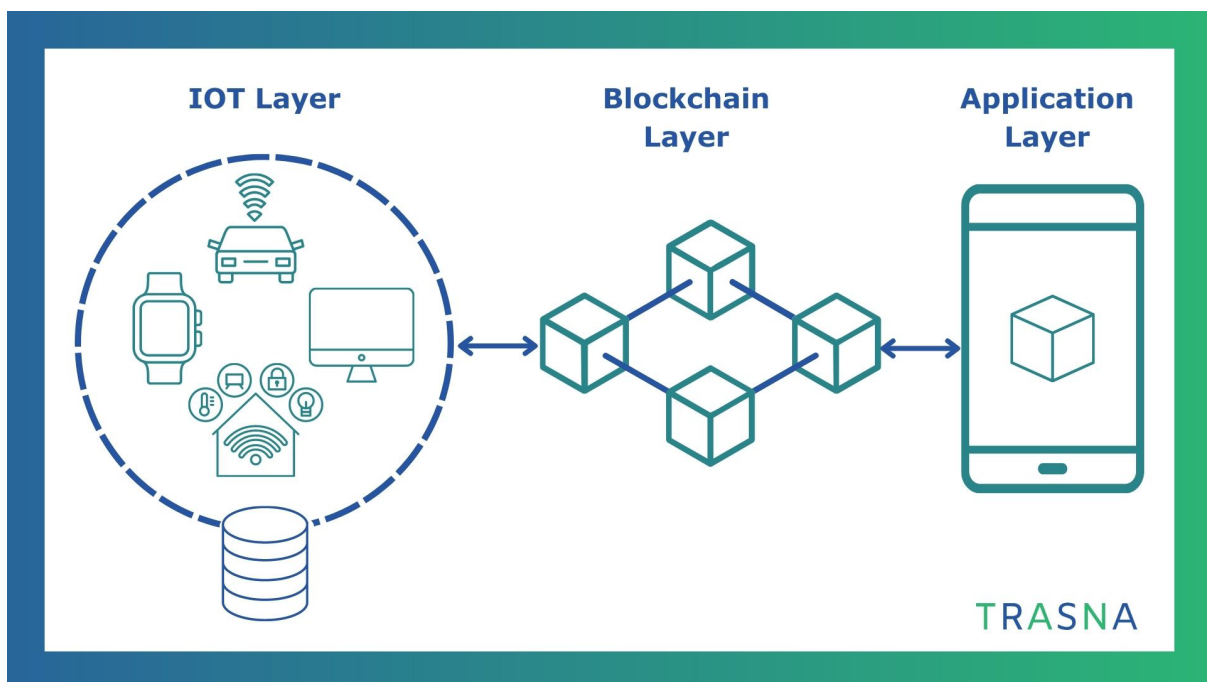
We argue that can the blockchain be able to communicate between IoT devices?

TRASNA's innovation and portability of Private Blockchain on chip resolves many such existing worries on IoT system. Data validation, identity, and trust on data of IoT only become useful if it is valid and precise.

Therefore, at present, IoT infrastructure relies on intermediaries and centralized entities to validate the data. In web3 IoT, blockchain would transform the IoT's structure from Client/Server to peer-to-peer. More novel consensus mechanisms can be used to verify transformation to address trustworthiness at the beginning. This would make IoT a trusted system that allows direct communication between devices without intermediation.

From technical perspectives, TRASNA develops a customized hashing algorithm<sup>3</sup> in blockchain to ensure immutability, which means that once data is added to the blockchain, it cannot be changed or tampered with.

As mentioned earlier, in a blockchain, each block contains a set of transactions and a unique hash value that is calculated based on the data in the block. The hash value is a digital fingerprint of the data, which means that even a small change in the data will result in a completely different hash value. When a block is added to the blockchain, its hash value is also included in the next block in the chain. This creates a link between the blocks, where each block is linked to the previous block through its hash value. As a result, any attempt to change the data in a block will not only result in a different hash value for that block, but also for all subsequent blocks in the chain. This means that the entire blockchain would need to be recalculated and rebuilt in order to make any changes, which is practically impossible given the distributed nature of the blockchain.



In the context of redefining the IoT business use cases with Web 3 interface, it is worthy to coin certain important aspects where Web2 IoT companies could look into a multi-phase web3-oriented transformation strategy to minimize risk of the migration of system architecture and business model alterations following TRASNA’s initiatives on portability and validation of Blockchain on device:

- **Reengineering a modified customer engagement approach** - It is always relevant initially to reinvestigate the exact need for the Web 3 customer, how much they are asking for the ownership to use the device and associated processes? What at present is value for their money? TRASNA’s techno commercial model on private blockchain could ensure this need.

- **Evaluate the new business model of Decentralization** – The other crucial factor is to identify whether the IoT business model at the customers’ end lies at initial stage or is it matured to proceed towards the new beginning of private Blockchain and Web3 decentralization on the IoT system? Web3 principally focuses to decentralize the internet and allow consumers to take back control of their data. IoT simultaneously aspires to bridge nearly Internet of Everything (IoE).

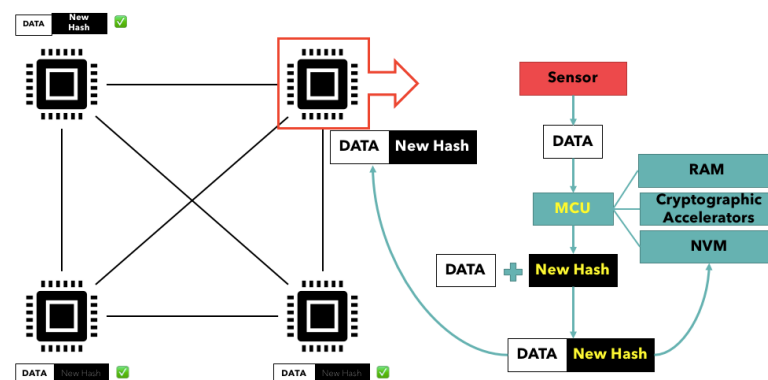


Figure 1. High-Level Interaction Schema of IoT & Private Blockchain Mechanism@ TRASNA -Solutions Ltd.

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The report published by Study on cost benefit analysis of in EU Member States regarding Smart meter (September 2021) already pointed several such benefits of security and risk mitigation and decentralization of embedded security in connected systems. As Web 3 interface will transit through a rigorous IoT dynamic business model, so it is always expected to present it more adaptative and predictive model of such decentralized yet hybrid synchronization of Blockchain on devices.

## **Conclusion**

Web 3.0 is impacting on the business model specifically, for the IoT networks and embedded systems. However, to position the theme of IoT business model, enterprises should introspect multiple aspects from the technical points of views e.g. Private Blockchain, secured storage and low latency. On the other hand, the orientation of existing users and customers' needs to be polished and to be evaluated with respect to this this new transformation of digital trend of Web 3.0. Subsequently, as the hardware and embedded security is being one of the prime factors of IoT environment; therefore, it is worthy to mention that TRASNA's new generation smart design of private Blockchain on chip will foster Web 3.0 significantly.

## **Glossary:**

1. Decentralized internet: In blockchain, decentralization refers to the transfer of control and decision-making from a centralized entity (individual, organization, or group thereof) to a distributed network.)
2. Distributed fashion: In the design of IoT system, the sensors and devices will be distributed even physically apart with a pre-defined distance and they are connected among each other remotely.

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3. Hashing algorithm is a security measure. It is a mathematical function that garbles data and makes it unreadable. Hashing algorithms are one-way programs, so the text can't be unscrambled and decoded by anyone else.)

#### References:

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#### ABOUT TRASNA

TRASNA is focused on Technology leadership providing semiconductors and its related software and services solutions for IoT mass deployment. TRASNA combines innovation in semiconductor design, secure Software, edge computing, AI and blockchain integration to deliver the most innovative and optimized System-On-Chip to take advantage of huge IoT opportunities facilitated by the emergence of 5G in which networks can meet the communication needs of billions of connected objects and where the NB-IoT is part of 5G specifications.

TRASNA System-on-Chip embeds RISC-V cores, i-SIM and GNSS, developed to offer the lowest Bill of Material to the market to scale up the deployment of massive IoT.

TRASNA's Telecom Business Unit, provides a unique offering with all products and services related to IoT connectivity such as eSIMs / eUICCs and expertise so its customers can build, innovate, and grow successful businesses in a constantly progressing environment. We support and guide our customers through every step of their IoT device journey.

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