
ITU

# Web3.0 evolution:

## Upgrading of production mode in digital Era

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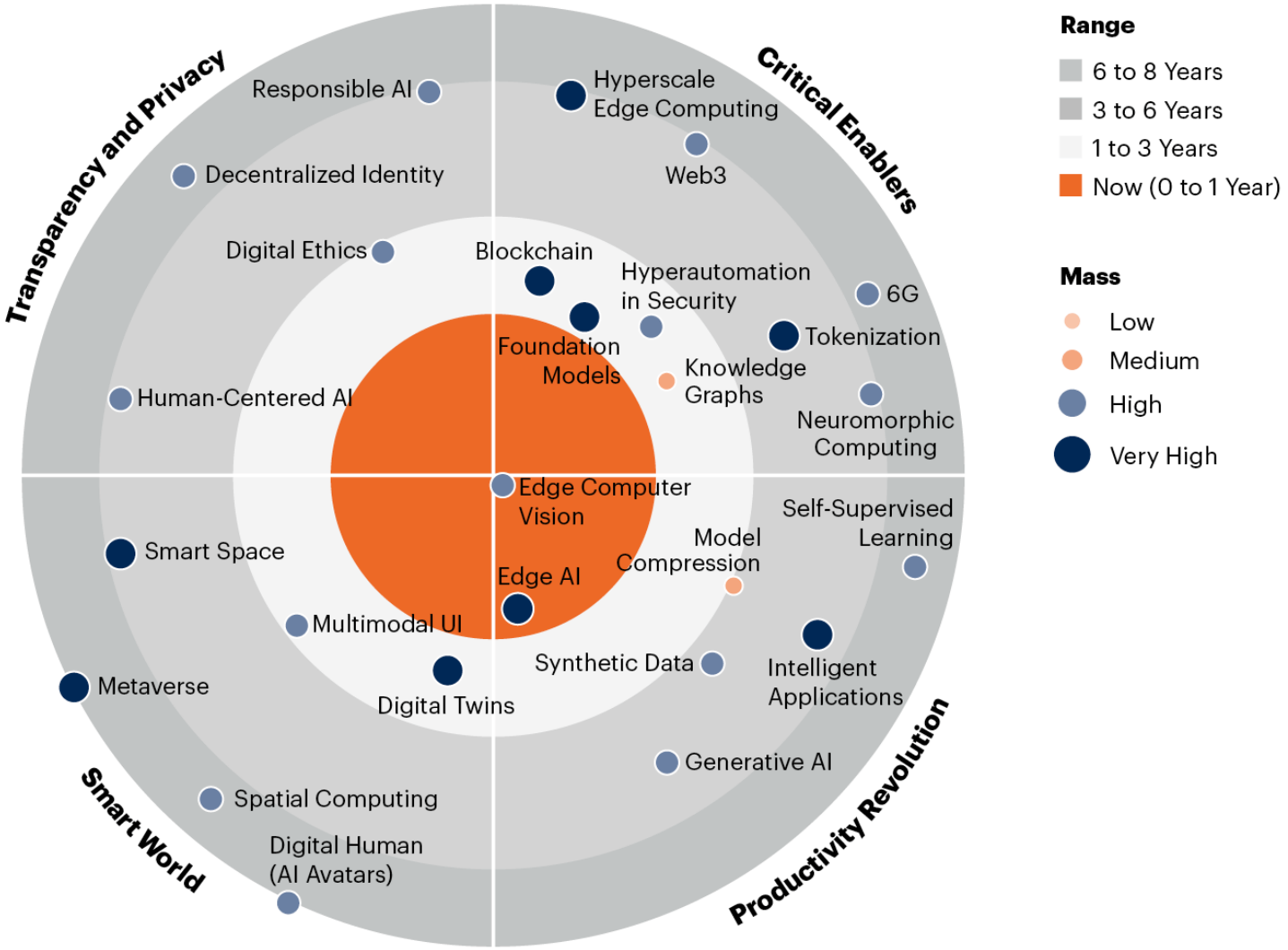
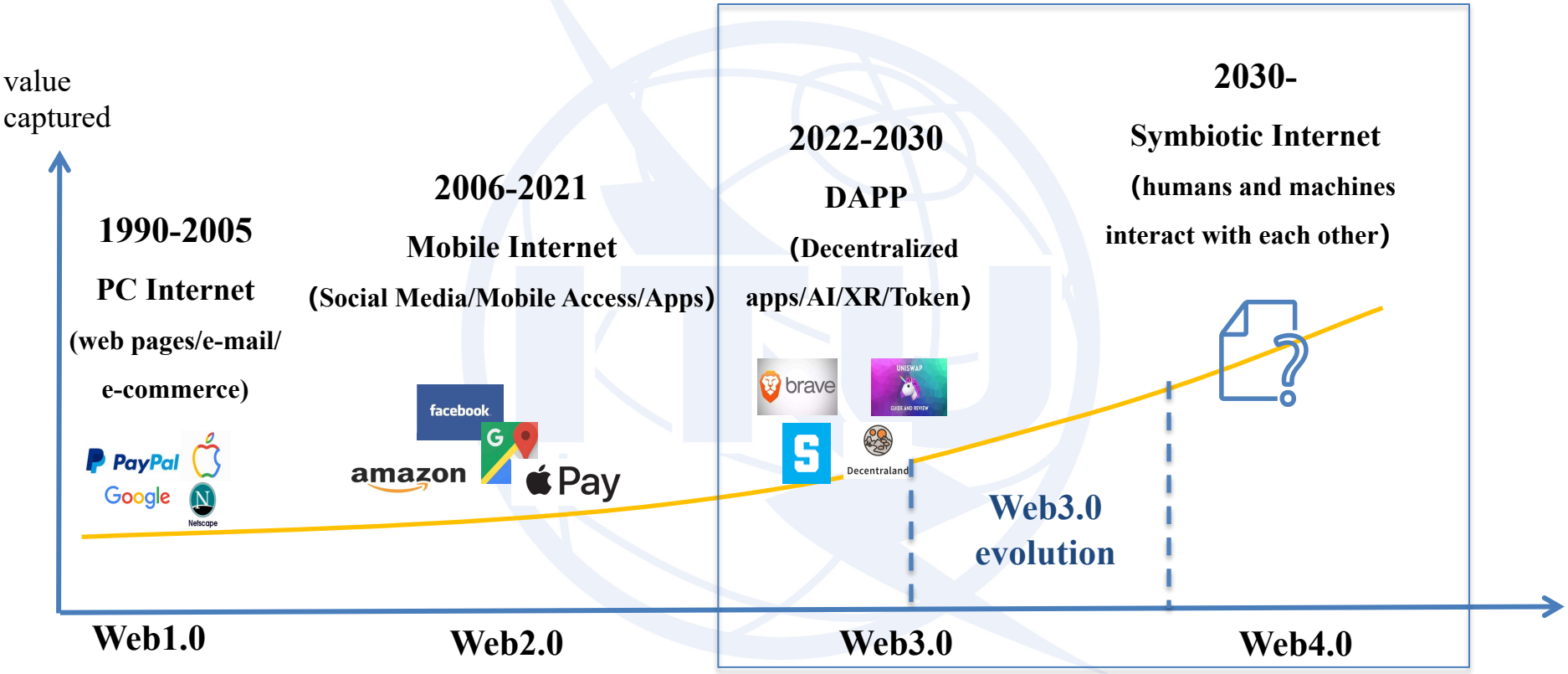
*China Telecom*

# 2023 Gartner Emerging Technologies and Trends Impact Radar



# Integration of productivity and production relations promote the development of the Internet



# DLT-based Web3.0






**02** Value Internet

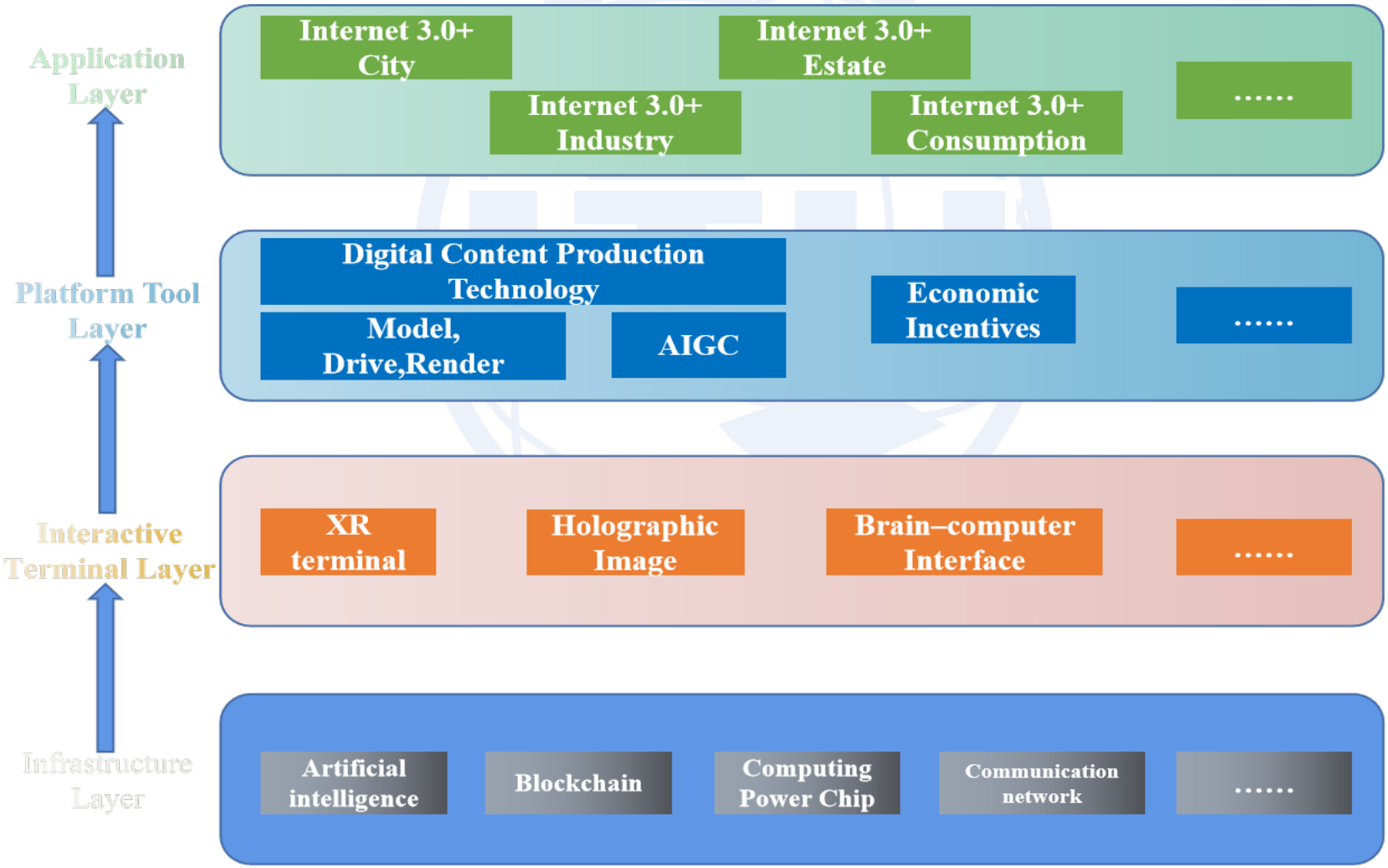
- Data is assets
- Focus on value generation and assets protection

**01** Information Internet

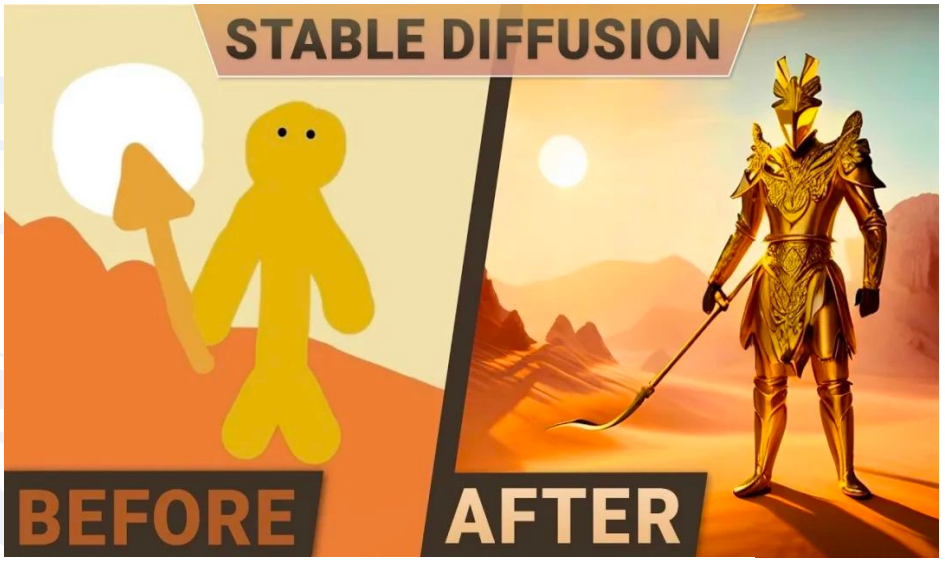
- Data is information
- Focus on connectivity

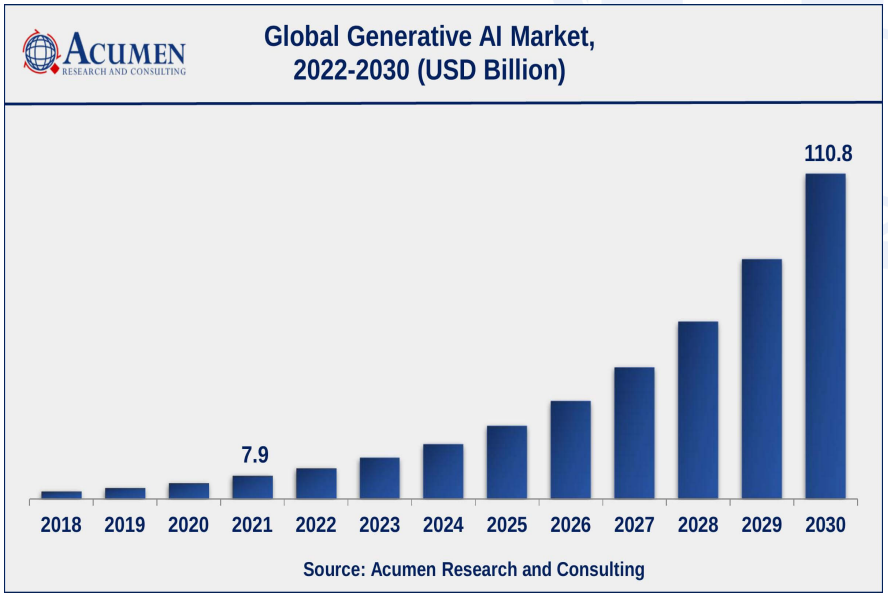
# Systematic framework for Web3.0 evolution

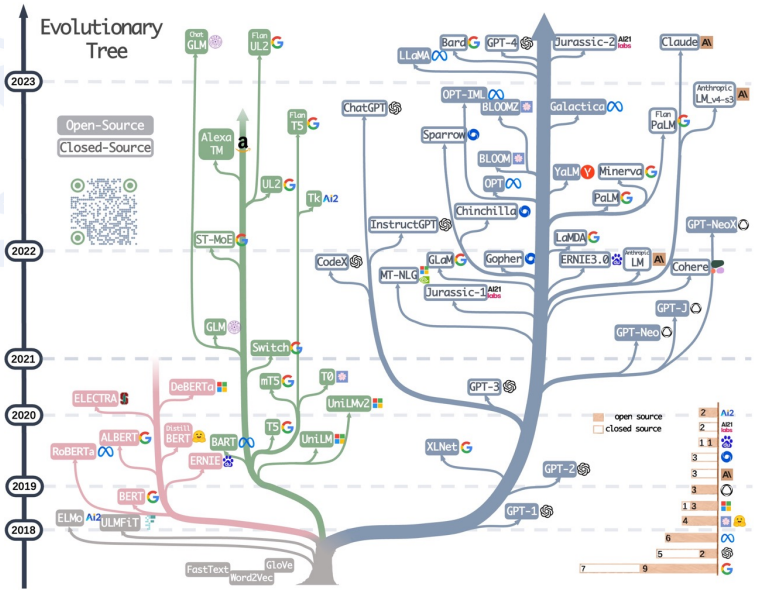
With the development of emerging technology, web3.0 is no longer just a DLT-based production relations revolution, Explosive productivity growth drives the acceleration of the web3 evolution era.



# AIGC, disrupting web3.0 content production, drive Web3.0 productivity

# Web3.0-related activities in ITU-T

**Web3.0-adhoc**

01

- Discussed the existing feasible technologies to support emerging web, like DLT;
- Introduce the technical and standardization consideration of web3.0

…

**SG13 Future networks and emerging network technologies**

02

- Facing future networks and emerging network technologies promote development of web3.0, especially in
- Q1\Q2\Q17\Q22\Q23… has DLT-related activities

…

**SG16 Multimedia and related digital technologies**

03

- DLT\Big data technologies in Q22
- AI technologies in Q5

…

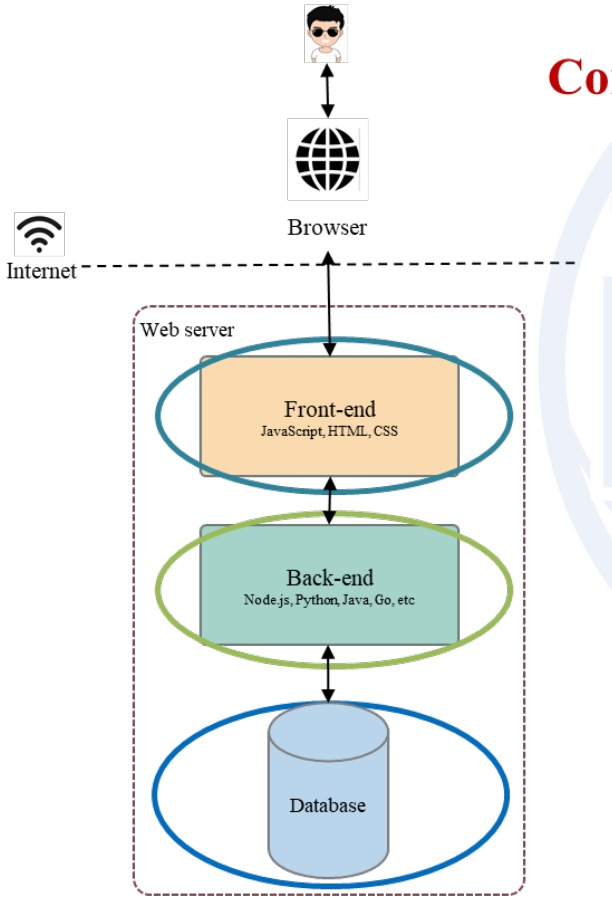
**ITU-T Focus Group on Metaverse**

04

- TG-Embodied AI in FG-MV WG2
- TR-Network infrastructure in WG3

# From the network architecture evolution perspectives

Future Network provides underlying performance assurance and security capabilities to support the core functional activities and multi-industry applications of Web3.0




Web2.0

## Comparison of Web2.0 & Web3.0 network architecture

Web2.0:Front-endinteraction protocol

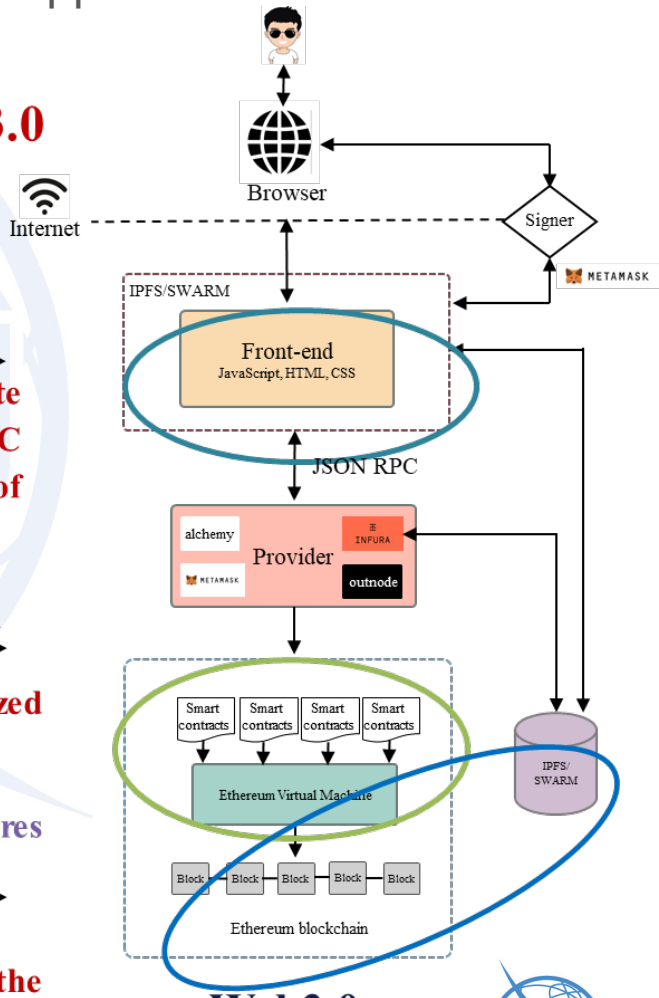
Web3.0: After the user signs with private key, the remote application invokes RPC to interact with the smart contract of Dapps.

Web2.0:
back-end business logic of the centralized web site

Web3.0: Virtual machine of decentralized nodes & Smart contracts that define business state.

Web2.0:Centralized database that stores application state

Web3.0: Compute nodes jointly owned and maintained by participants in the network; And the decentralized storage.



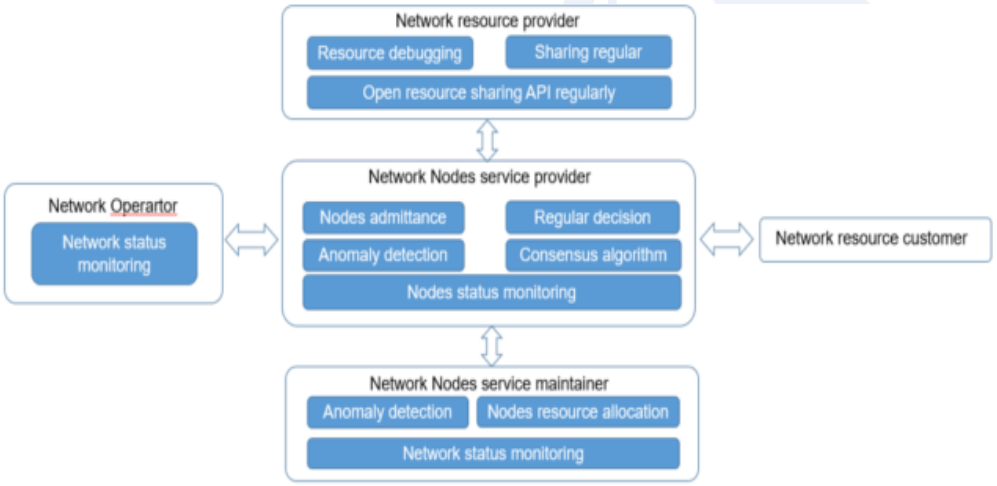

Web3.0

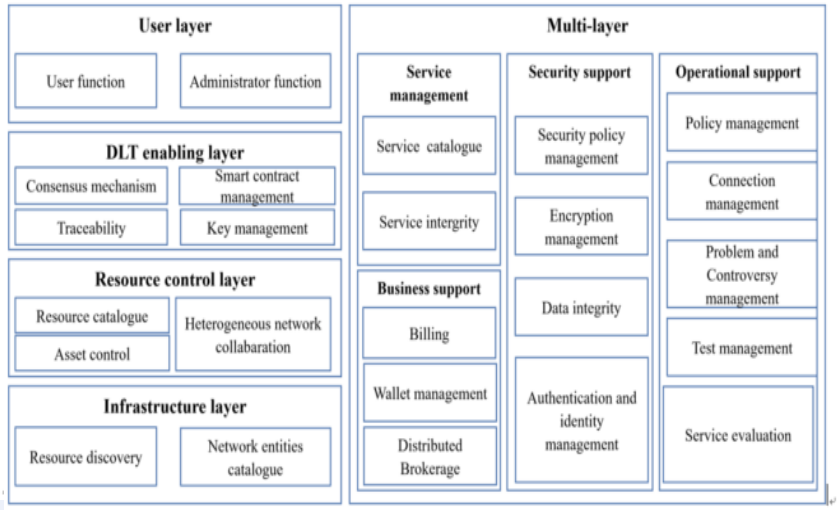
# China Telcom has DLT-related recommendations in SG13

| work item | topic | SDO |
|---|---|---|
| Y.NRS-DLT-arch: functional architecture of network resource sharing based on distributed ledger technology | NRS (network resource sharing) | ITU-T SG13 Q2 |
| Y.NRS-DLT-reqts “Scenarios and requirements of network resource sharing based on distributed ledger technology” | NRS (network resource sharing) | ITU-T SG13 Q2 |
| Y.MDRM-DLT-reqts： “Requirements and framework of multi-dimensional resource matching of NGNe based on DLT” | multi-dimensional resource matching | ITU-T SG13 Q2 |
| Y.SNICE-DLT-reqts： “Requirements and framework of distributed S-NICE based on DLT” | distributed S-NICE | ITU-T SG13 Q2 |
| ITU-T Y.3530 ： “Cloud computing - Functional requirements for blockchain as a service” (09/2020) | BaaS（blockchain as a service） | ITU-T SG13 Q17 |
| Y.SCid-fr "Requirements and Converged Framework of Self-Controlled Identity based on Blockchain" | Identity management | ITU-T SG13 Q22 |
| Y.FMSC-DLT: “ Distributed ledger technology for fixed, mobile and satellite convergence in IMT-2020 networks and beyond | FMSC-DLT (DLT fpt fixed, mobile and satellite convergence ) | ITU-T SG13 Q23 |

# Y.NRS-DLT (Q2/SG13): Core competence for network combined with DLT

NRS-DLT is a distributed network resource sharing which support traditional network system interaction and provide DLT related capabilities among various network entities by utilizing DLT as a data carrier for resource status, for allocating computing, storage, and network resources of infrastructure layer and network layer to applications.




Functional architecture of network resource sharing based on DLT

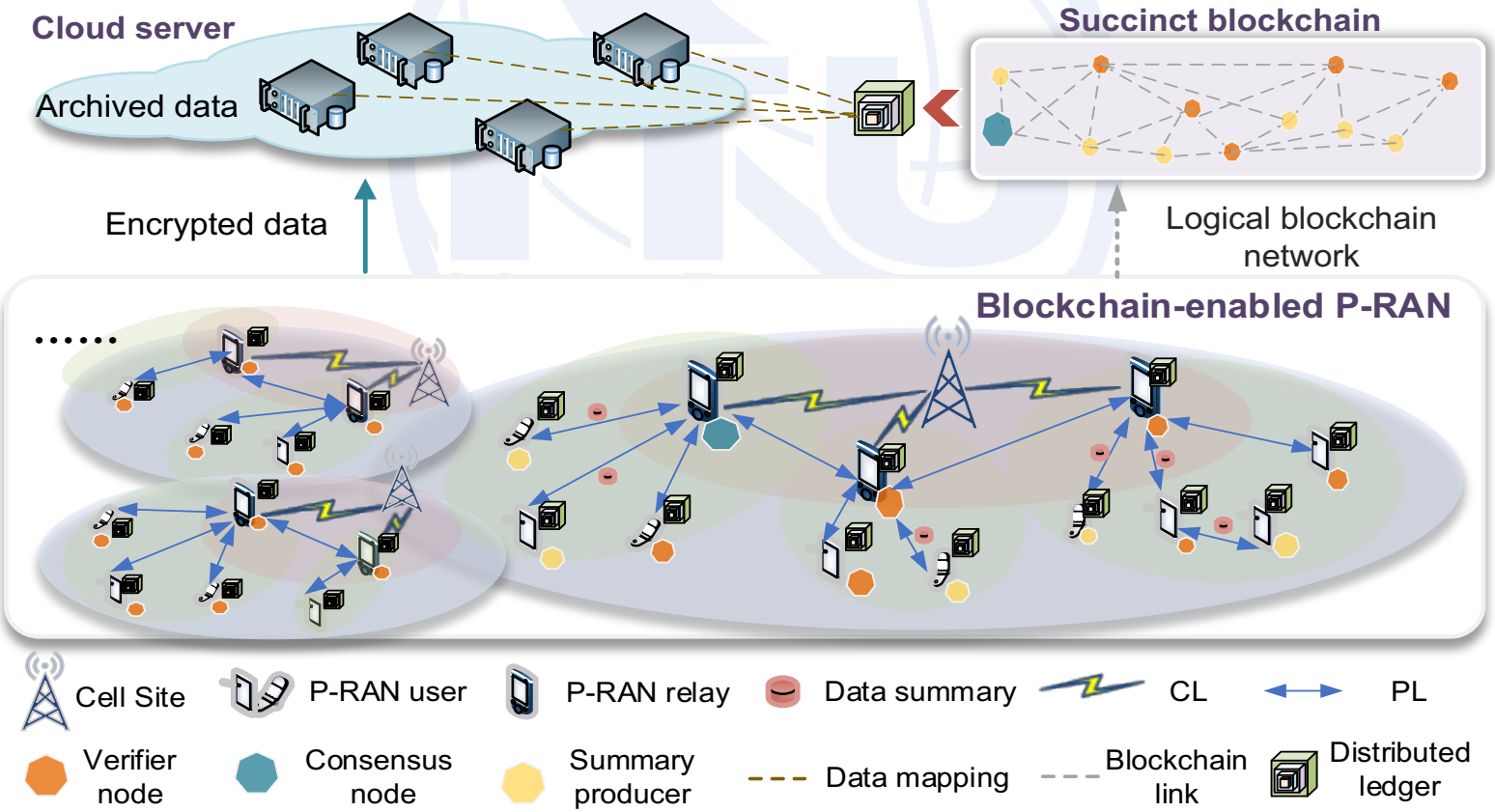
The NRS-DLT ecosystem includes the following roles;

- Network Nodes service provider;
- Network Nodes service maintainer;
- Network resource provider;
- Network resource customer;
- Network operator.

# China Telecom Practices -- P-RAN : An application of DePIN

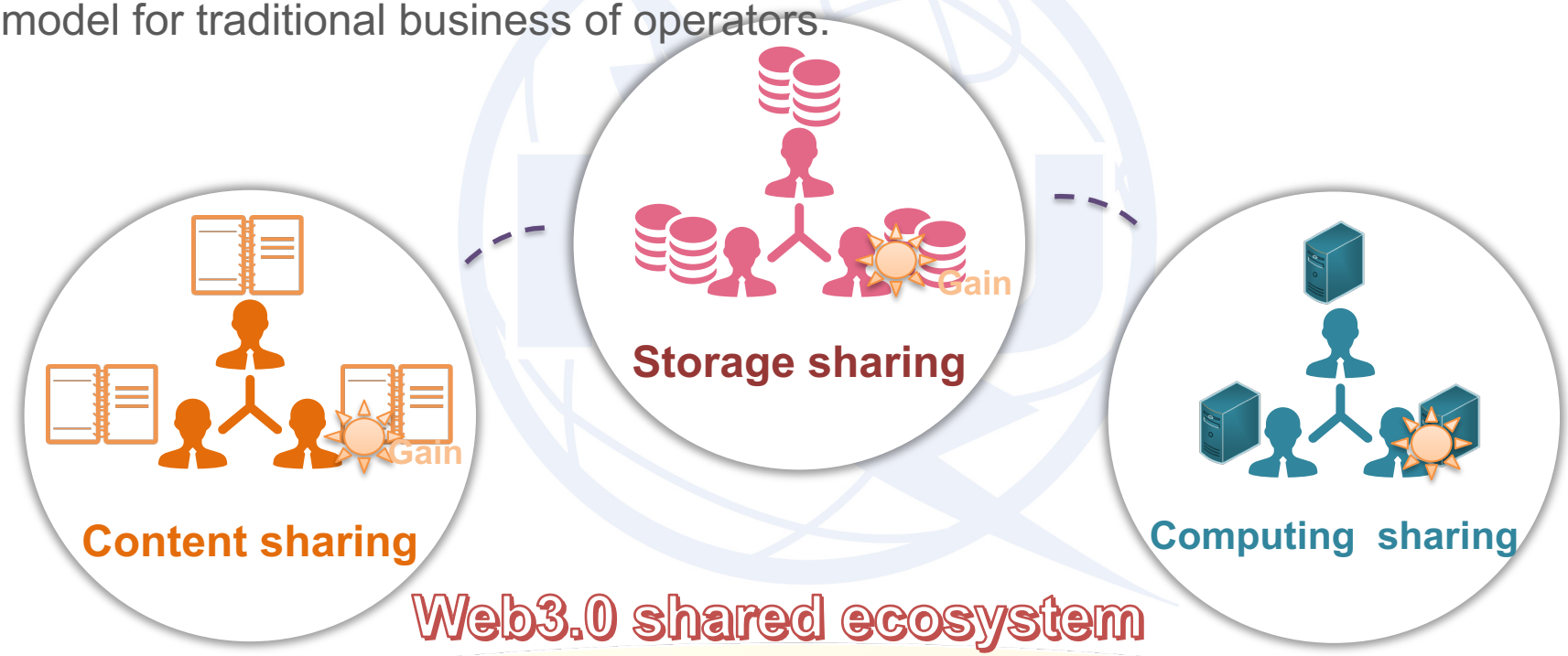
DePIN: Decentrailized Physical Infrastructure Networks, a new combination of Web3 and AIoT, aim to organize and coordinate the millions of devices in the real world and to build a large-scale and attractive underlying infrastructure network from the supply side.

**P-RAN=Proximity Network + Radio Access Network**



# China Telecom Practices -- P-RAN : An application of DePIN

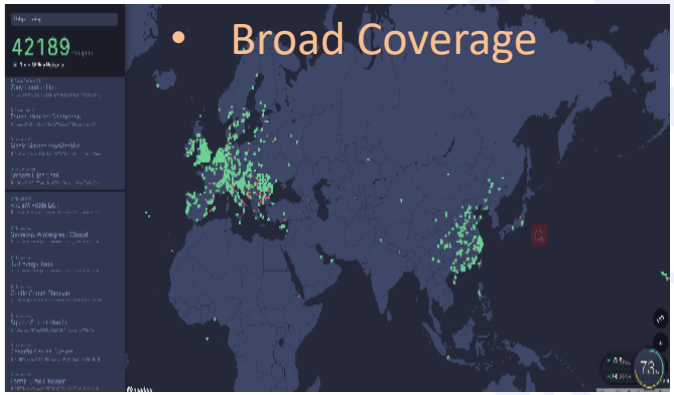
**“DLT in P-RAN”** opens an avenue for operators to implement a futuristic Web 3.0 operation with which users can own part of the network instead of the traditional total ownership approach, beyond that DLT also gives a web3.0 incentive operating model for traditional business of operators.



# Web3.0—A figurative representation of the metaverse

Asset value is the underlying logic & Co-creation, sharing and co-governance (DAO) is the core value of metaverse.

**The development of metaverse is predicated on the construction of a new infrastructure with large-scale and efficient collaboration**





**Annex A**

**A.1 justification for proposed draft new Technical Report FGMV-D3.1-NI-rc" Requirements and challenges associated with network infrastructure to enable the metaverse"**

| | | | |
|---|---|---|---|
| ***Working Group/ Task Group*** | WG3 | **Proposed new *deliverable*:**<br>☐ **Technical specifications**<br>☑ **Technical report**<br>☐ **Other:** _____ | 8 June 2023 |
| **Reference and title:** | Technical Report ITU-T FGMV-NI-rc, " Requirements and challenges associated with network infrastructure to enable the metaverse " | | |
| **Base text:** | FGMV-WG3-O-008 | **Target date:** | December, 2024 |
| **Editor(s):** | Jingwen Li, China Telecom, lijw21@chinatelecom.cn<br>Meiling Dai, China Telecom, daiml1@chinatelecom.cn<br>Xingyu Shang, China Telecom, shangxy1@chinatelecom.cn<br>Xiaoou Liu, China Telecom, liuxo@chinatelecom.cn | **Approval process:** | Agreement |

**Purpose and scope** (defines what issue this document will address, thus permitting readers to judge its usefulness for their work; also defines the intent or objective of the document and the aspects covered, thereby indicating the limits of its applicability):

This technical report introduces and describes the requirements and challenges associated with network infrastructure to enable the metaverse. The scope of this document includes:

- High-level architecture of network infrastructure to enable the metaverse.
- Challenges associated with network infrastructure to enable the metaverse.
- Requirements associated with network infrastructure to enable the metaverse.
- Scenarios and use cases.

**Summary** (provides a brief overview of the proposal):

As an emerging technology, metaverse carries people's fantasy of technological development and covers a variety of technologies. It is considered a digital world parallel to the physical world and has the characteristics of high immersion, continuous operation, economic operation, low delay, and high dispersion, etc. To build a new digital space in the future, metaverse puts forward new requirements associated with network infrastructure.

Network infrastructure is very important for metaverse, and needs further research as a technical report. We believe that many published or under-developing Recommendations about network infrastructure can be used for supporting metaverse. Network infrastructure standards that are more in line with the characteristics of the metaverse should be further studied.

This technical report introduces and describes the requirements and challenges associated with network infrastructure to enable the metaverse, including gap analysis on the standardization research, high-level architecture, challenges and requirements, and use cases associated with network infrastructure to enable the metaverse.

**Relations to ITU-T Recommendations or other documents** (approved or under development):

ITU-T Y.MNS-DLT-fr, ITU-T Y.NRS-DLT-reqts

**Network infrastructure TR in FG-MV, contributions are welcomed**

# China Telecom Practices – BSIM card: Identity portal to the Web3.0

Web1.0

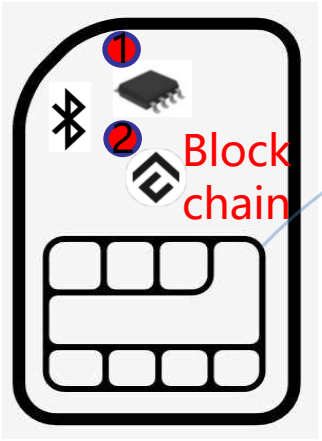
Mobile communications

Web2.0

Mobile Internet & real-name authentication

Web3.0

Identity and digital asset management




**Key storage**

More secure than soft wallets, more convenient than hard wallets

**Digital asset management**

Management of digital assets, like NFT, etc.

**Unified Identity**

Enabling Trusted Identity and Interoperability

# Thanks for your listening!

*Jingwen Li*

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