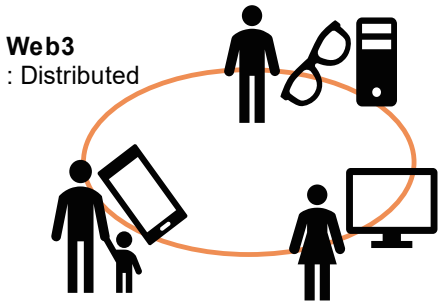
Chapter 3

Section 1

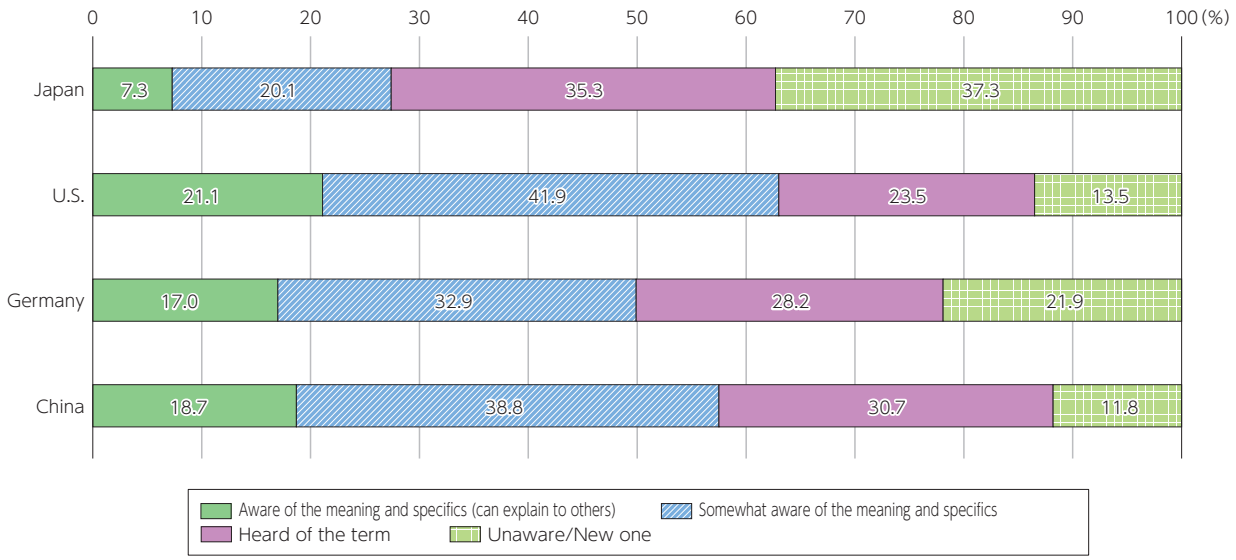
1. Features of Web3 (Figure3-1-1-1 in White Paper)



	Web3
Flow of data and information	Distributed (information and rights are not biased by distribution management)
Core technology	Blockchain

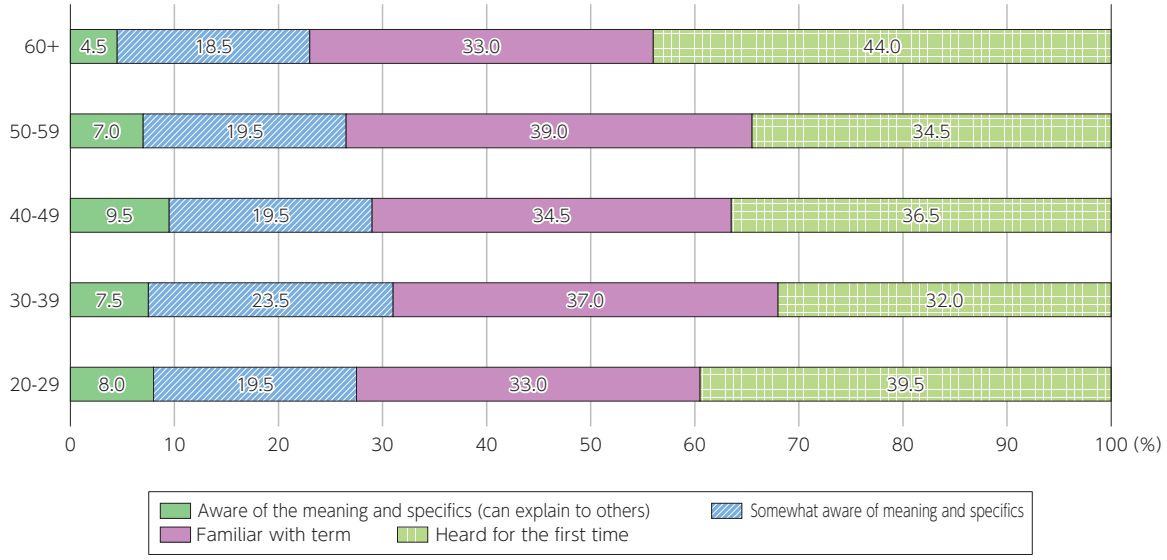
(Source) Based on Document 1-2 from the 1st meeting of the MIC Study Group on the Utilization of Metaverse Towards Web3 Era

2. Awareness of metaverses by country (Figure3-1-2-1 in White Paper)



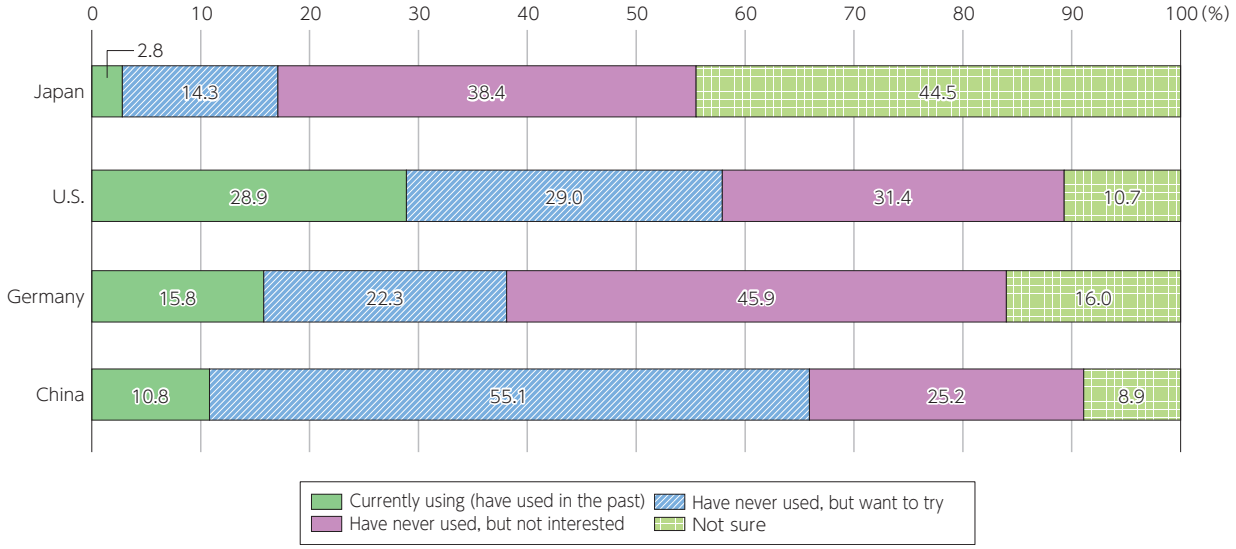
(Source) MIC (2023) "Survey Research on Advancement of ICT Infrastructure and Flow of Digital Data and Information"

3. Awareness of metaverses by age



(Source) MIC (2023) "Survey Research on the Advancement of ICT Infrastructure and Distribution of Digital Data and Information"

4. Experience of using a metaverse (by country) (Figure3-1-2-2 in White Paper)



(Source) MIC (2023) "Survey Research on Advancement of ICT Infrastructure and Flow of Digital Data and Information"

5. Metaverse School of Engineering, the University of Tokyo (Figure3-1-2-3 in White Paper)

(Source) The University of Tokyo

6. Virtual Shibuya (Figure3-1-2-4 in White Paper)

(Source) Shibuya 5G Entertainment Project

7. Metaversity (U.S.) (Figure3-1-2-5 in White Paper)

Real university

Metaverse-based university

(Source) Publicly available information provided by VictoryXR, Inc. and others

8. Metaverse Seoul (Korea) (Figure3-1-2-6 in White Paper)

(Source) Publicly available information provided by Seoul City and others

9. Promotion measures for metaverses in other countries (Figure3-1-2-7 in White Paper)

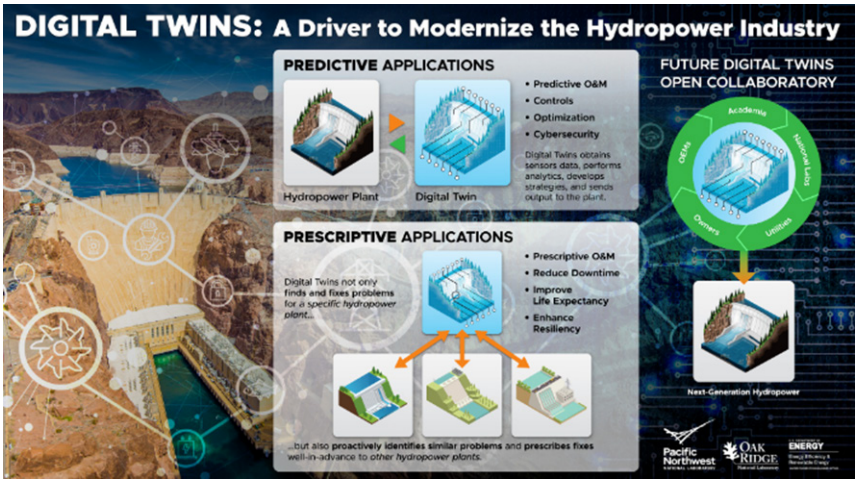
Country	Overview, etc.
U.S.	In August 2022, the Congressional Research Service released a report titled "The Metaverse: Concepts and Issues for Congress" that summarizes the policy issues that should be considered by Congress, such as metaverse technologies and concepts. The report lists issues such as the appropriate use of content, the protection of personal information such as biometric information, the domination of platforms by major companies, and the disparity between those who have access to high-speed communications environments and those who do not.
EU	In March 2023, a policy paper title "Metaverse - Virtual World, Real Challenges" was published. The report provides an overview of metaverses (definition, history of metaverses, future fields of application, development time span, elements and related technologies, countries and companies considered to play a major role) and summarizes potential challenges and opportunities in the EU (why and how the EU should engage with metaverses).
South Korea	In January 2022, the Ministry of Science and ICT published the Korea Metaverse New Business Leading Strategy. In line with the development of metaverses, the strategy states that the Korean government will take measures such as the development of a sustainable metaverse ecosystem based on public-private cooperation, human resource development, development of industry-leading companies, and the establishment of sound and exemplary infrastructure, as well as undertake initiatives to support platform development, develop practical human resources, establish funds, and develop rules, etc.
China	In July 2022, the Shanghai Municipal People's Government in China released its 14th Five-Year Plan for the development of Shanghai's digital economy. In the metaverse field, the plan states that virtual reality technologies will be enhanced, platforms will be developed, and new digital entertainment such as virtual concerts will be fostered.

(Source) Based on Document 7-2 from the 7th meeting of the MIC Study Group on the Utilization of Metaverse Towards Web3 Era

10. VIRTUAL SHIZUOKA (Figure3-1-2-8 in White Paper)

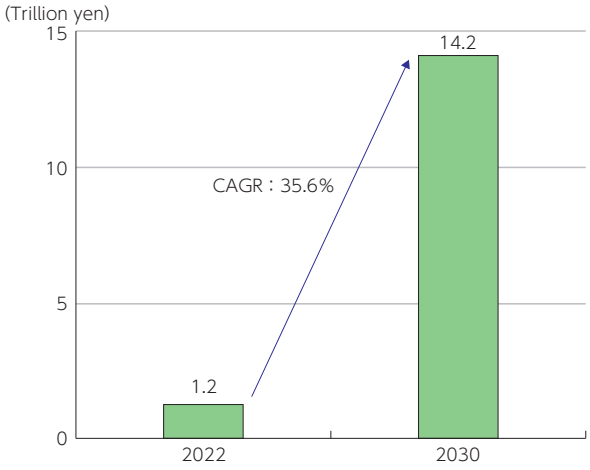
(Source) Shizuoka Prefecture

11. Digital twin for hydroelectric systems (U.S.) (Figure3-1-2-9 in White Paper)



(Source) Oak Ridge National Laboratory HP

12. Global market size of generative AI (Figure3-1-3-1 in White Paper)



(Source) Survey by Grand View Research Inc.

Section 2

1. Examples of recent telecommunications services outages (Figure3-2-1-1 in White Paper)

Area	Date occurred	Details
Global	June 2022	Cloudflare: An outage occurred in 19 data centers throughout the world.
UK	July 2022	Google, Oracle: An outage occurred in cloud services due to a heatwave.
Japan	July 2022	KDDI: A communications outage occurred due to human error.
Japan	Aug. 2022	NTT West: A communications outage occurred in the FLET'S Hikari Internet service due to equipment failure.
Japan	Sept. 2022	Rakuten Mobile: A communications outage occurred due to an equipment error.
Japan	Sept. 2022	Softbank: A communications outage occurred due to human error.
South Korea	Oct. 2022	Naver, Kakao: A service outage occurred due to a fire at an SK C&C data center. Service was restored in South Korea on the day of the outage for Naver, and then five days later for Kakao.
Japan	Dec. 2022	NTT Docomo: A communications outage occurred due to an equipment error and human error.
U.S.	Feb. 2023	T-Mobile: A communications outage occurred.
Japan	April 2023	NTT East, NTT West: A communications outage occurred in services such as "HIKARI DENWA."

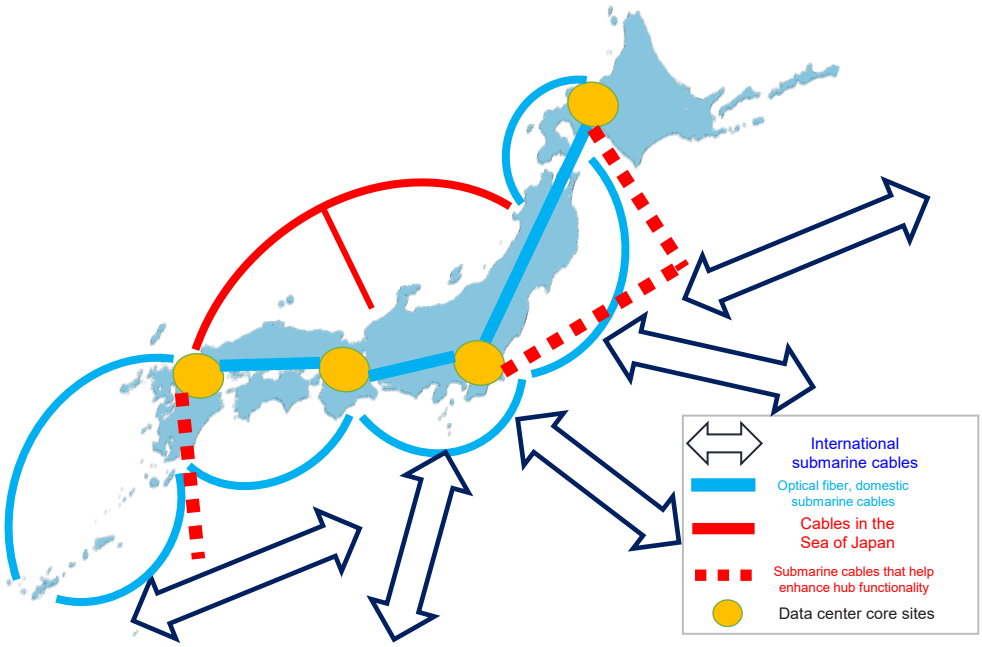
(Source) Created by MIC based on publicly available documents released by various companies

2. Efforts by Japanese telecom operators to utilize and introduce satellites, etc. (Figure3-2-1-2 in White Paper)

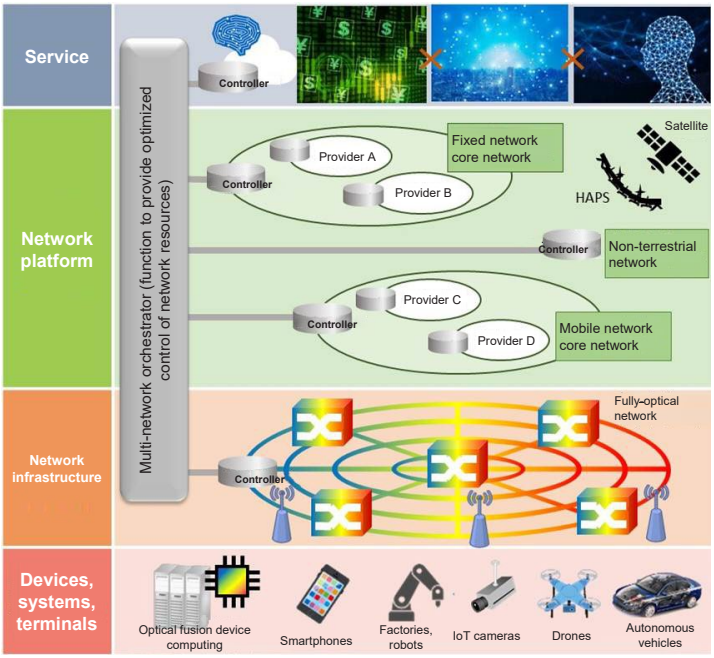
	Overview
NTT	Established Space Compass, jointly funded by SKY Perfect JSAT. Aims to begin providing low-delay communications services within Japan using High Altitude Platform Station (HAPS) in fiscal 2025.
KDDI	Signed contract with SpaceX (U.S.) to use Starlink as the backhaul link to au base stations. Began operating in Hastushima (Atami, Shizuoka Prefecture) in December 2022, and plans to expand service to approximately 1,200 locations throughout Japan.
SoftBank	Currently developing an NTN solution to provide communications networks from outer space and the stratosphere, using three services: (1) satellite phone service provided by THURAYA, (2) LEO satellite communications service provided by OneWeb, and (3) HAPS provided by HAPSMobile (a subsidiary of SoftBank).
Rakuten Mobile	Working with AST SpaceMobile (U.S.) on the "SpaceMobile" project to build mobile broadband networks utilizing LEO satellites. Aims to allow smartphones to communicate directly with satellites.

(Source) Created by MIC based on publicly available documents released by various companies

3. Image of data center and submarine cables maintenance (Figure3-2-1-3 in White Paper)



4. The ideal Beyond 5G network (Figure3-2-2-1 in White Paper)

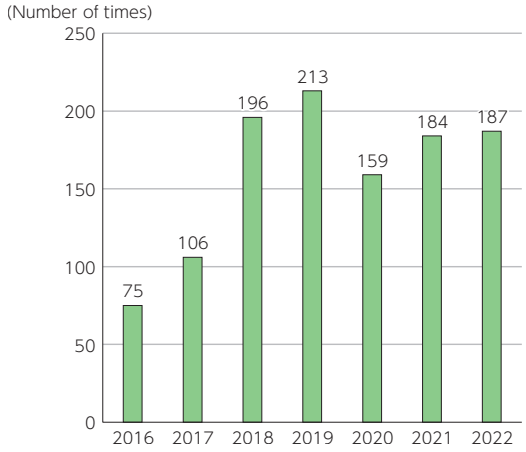


(Source) Summary of the Information and Communications Council's interim report on the "Information and Communications Technology Strategy Beyond 5G"

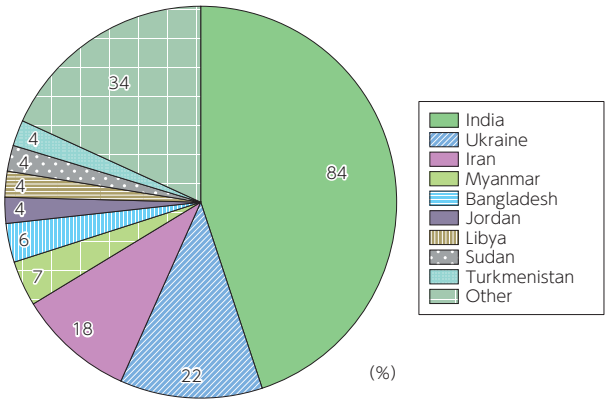
Column

5. Internet shutdowns in the world (Figure1 in White Paper)

Number of Internet shutdowns globally each year



Number of Internet shutdowns in each country (2022)



(Source) Created based on "WEAPONS OF CONTROL, SHIELDS OF IMPUNITY"