Key Points of the 2020 White Paper on Information and Communications in Japan

Key Points

Part 1
Special Theme: Digital Transformation and New Lifestyles Prompted by 5G

Chapter 1
5G Infrastructure for the Reiwa Era

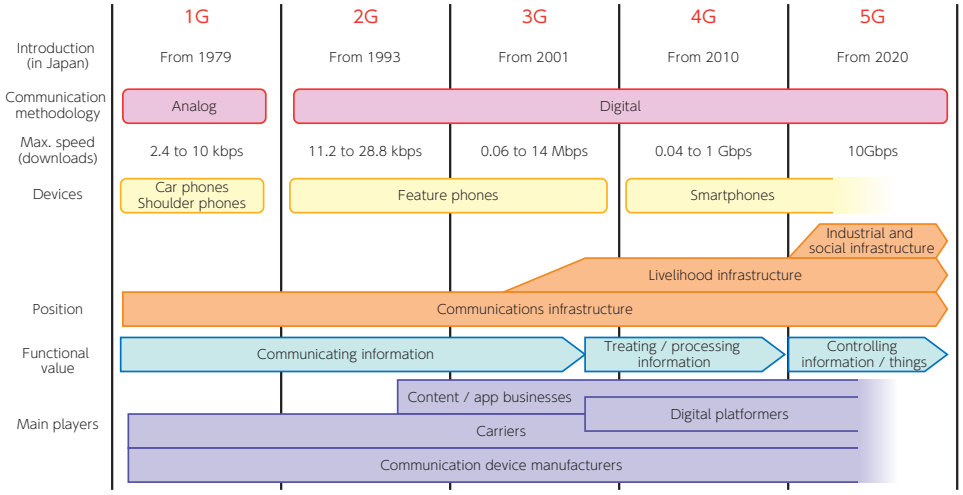
(1) Advancement of Mobile Communications Systems

◯Japan's mobile communications systems have greatly improved their functions through generation changes every 10 years since their introduction in 1979, and with the number of users increasing dramatically. Mobile communications infrastructure has evolved into life infrastructure.

◯5G systems put into commercial operations this year in Japan are expected to bring about an even greater social impact, as infrastructure for the IoT age, through their use in various sectors and industries.

◯After the United States and South Korea initiated commercial 5G operations in April 2019, other countries have followed suit one after another.

Mobile communications system evolution

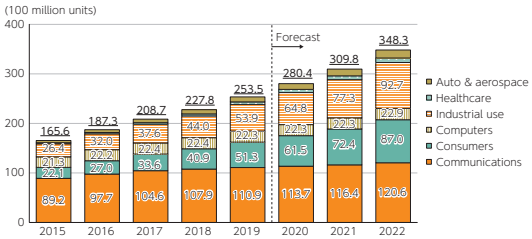


(2) Structural Telecommunications Market Changes

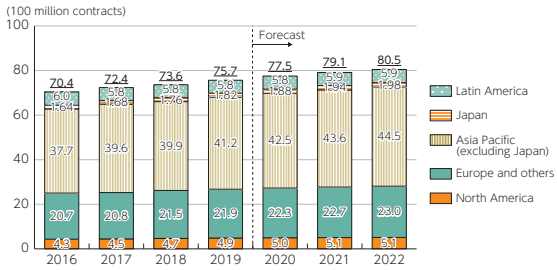
◯The number of IoT devices for industries and consumers is forecast to sharply increase in line with the diffusion of IoT/AI, and the launch of commercial 5G operations (①). On the other hand, the number of mobile service contracts is coming close to saturation and is forecast to only moderately increase (②).

◯Global mobile terminal market players have dramatically changed in the past decade. While Chinese enterprises have expanded their share of the smartphone market, the presence of Japanese enterprises in the market has declined (③).

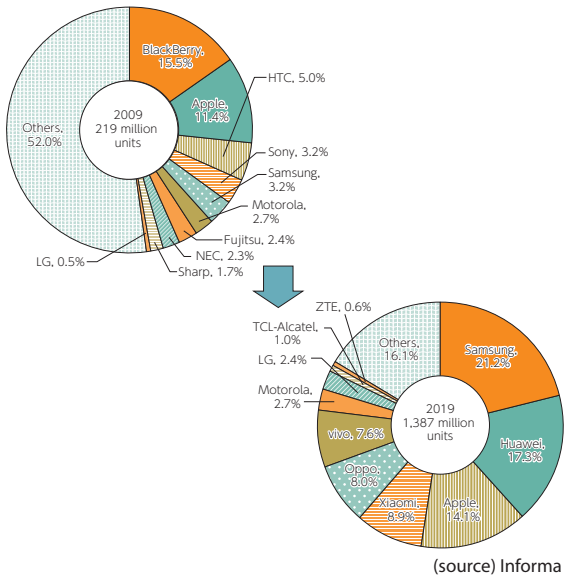
① Trends in the number of global IoT devices



② Trends in the number of global mobile service contracts



③ Global smartphone market share



(source) Informa

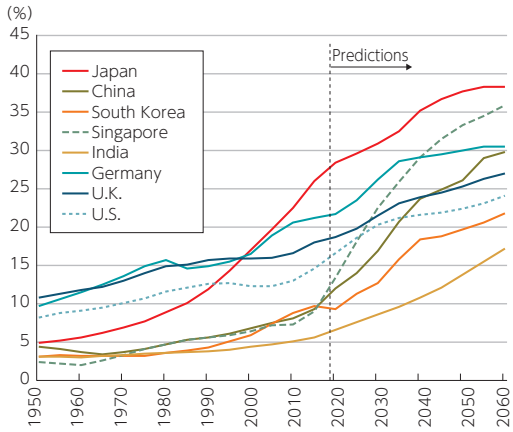
Chapter 2
Digitalization throughout Society Driven by 5G (1/2)

(1) ICT as Means to Solve Problems/(2) Initiatives for 2020s

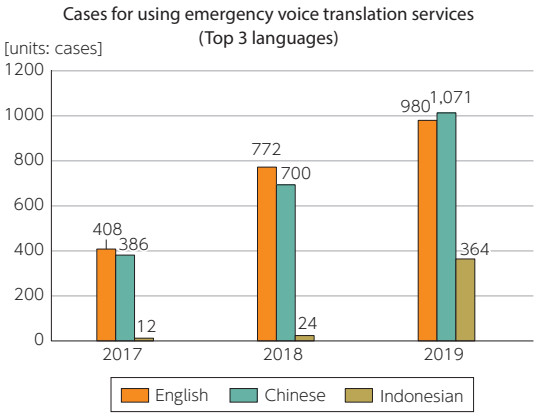
◯Japan is known as a developed country plagued with new problems, such as a declining population and birthrate, which is also rapidly aging (①). Therefore, Japan needs to introduce and use ICT to proactively improve the quality of employment and life, and raise labor productivity.

◯Japan's 5G mobile technology for the 2020s, which will feature cashless payment services, multilingual voice translation (②), facial recognition, workstyle reform through telework, disaster prevention, and other initiatives, will provide an opportunity to showcase Japan's ICT to the world, and innovate the whole of Japanese society.

① Japan as a developed country plagued with new problems as indicated by elderly population rates



② Use of multilingual voice translation services



(Sources)
① Prepared from the "World Population Prospects 2019" by the United Nations
②Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications

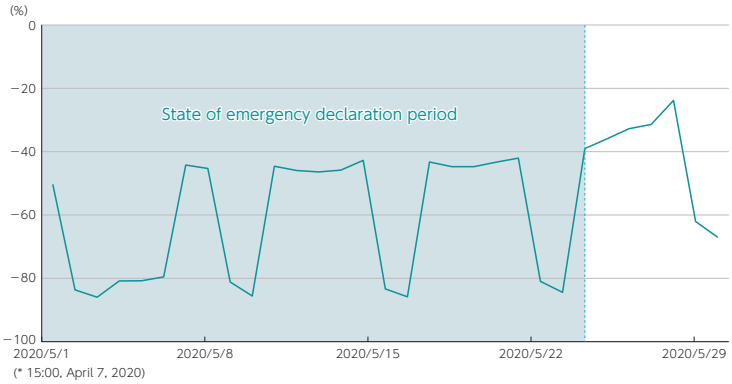
(3) Social Impact of the Novel Coronavirus Pandemic

◯The novel coronavirus (COVID-19) pandemic requires people to transition to new lifestyles.

◯Contactless lifestyle initiatives using ICT technologies have rapidly expanded, including telework, the administration sector's cooperation with civic tech and private enterprises in visualizing personal contacts (①), remote teaching (②) and the relaxation of requirements for remote medical care.

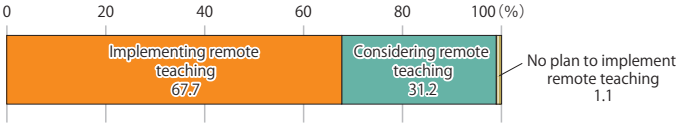
◯On the other hand, initiatives must be promoted to resolve new challenges, including an increase in telecommunications traffic through frequent ICT use, lack of security risk responses, a transition to electronic contracts and other business practice reforms, and balancing between public health and personal data utilization.

① Population changes from before* state of emergency declaration in the Tokyo Station area



(* 15:00, April 7, 2020)

② Future remote teaching plans at universities and technical colleges



(Source) Ministry of Education, Culture, Sports, Science and Technology (as of May 12, 2020)

Chapter 2
Digitalization throughout Society Driven by 5G (2/2)

(4) 5G to Drive Wireless Industrial Operations

○5G implementation in a wide range of industries and sectors is expected to improve business efficiency and create new values (①-④).

○Apart from nationwide mobile services undertaken by mobile operators, local 5G networks have been created for various entities as flexible mobile systems to meet regional and industrial needs, and there are plans to promote demonstrations from this Year to develop problem-solving models using local 5G networks.

Major assumed 5G use cases

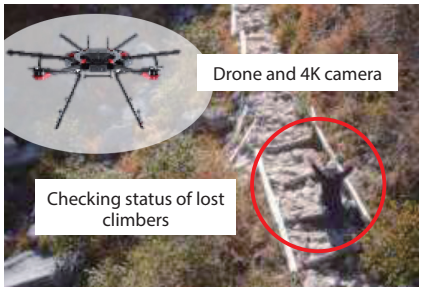
① Farming (e.g., remote monitoring of cows)

Plural 4K cameras take video of ear tags on cattle at barns and transmit video data through the 5G network to reduce human labor for locating cows and monitoring their milk output.

② Infrastructure construction (e.g., securing crane operation safety)

The system transmits 4K high-definition video data of areas blind to the crane operator, allowing the operator to safely operate the crane while checking video.

③ Security & safety (e.g., monitoring of mountain climbers)



4K video data from a drone is transmitted via a 5G network on a real-time basis at a mountain rescue office, allowing them to promptly check conditions of the location and climber.

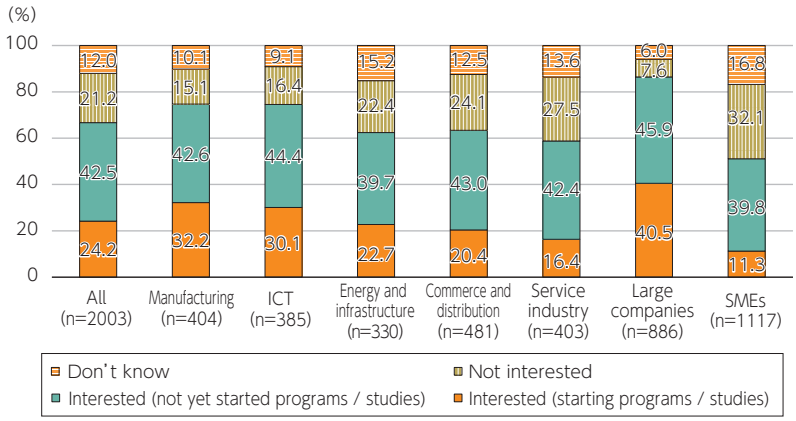
④ Mobility (e.g., advanced vehicle control)

In the demonstration test for truck platooning on an expressway, the ultra-low latency of the 5G network makes it possible to control the distance between trucks at 10 meters.

○A survey of enterprises' interests in 5G networks found that most companies in all industries are interested in 5G networks. Particularly, manufacturers were highly interested. Large enterprises indicated greater interest than others (①).

○Like Japan, some other countries have created local 5G systems for industrial use, and launched relevant licensing procedures.

① Enterprises' interests in 5G



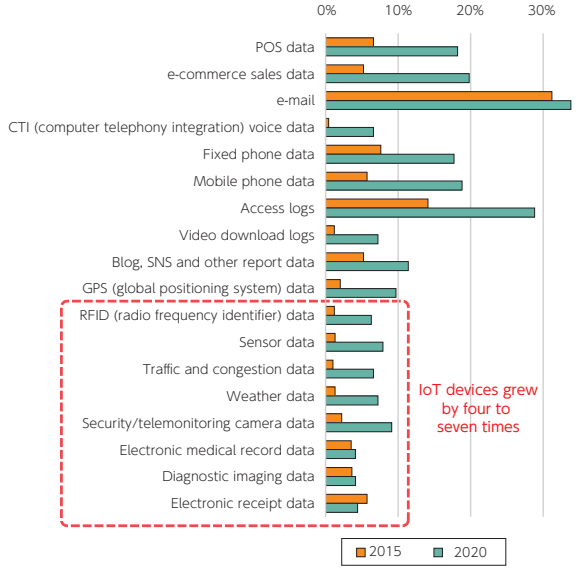
(Source) Ministry of Internal Affairs and Communications (2020) "Survey on Current Status of Measurement and Utilization of Economic Values of Digital Data"

Chapter 3
Data Flow and Security Underpinning the 5G Age

(1) Current Digital Data Utilization Status and Challenge

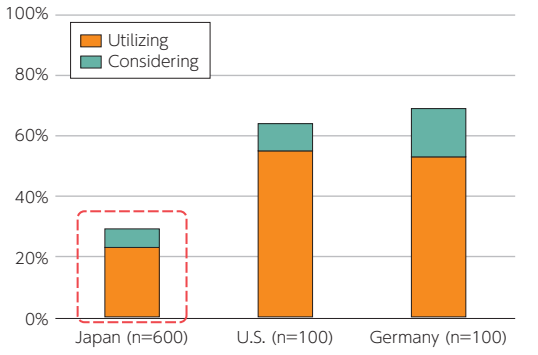
◯An increase in data flow through the expansion of content capacity and the diffusion of IoT devices is expected to further accelerate in line with the diffusion of 5G.
◯While the percentage of IoT devices has increased by four to seven times in the past five years in Japan (①), the most ideal situation would be for Japanese enterprises to utilize digital data as frequently as their U.S. and German counterparts (②).
◯The utilization of open data is promoted mainly for civic technologies in response to the COVID-19 pandemic, and is expected to help to resolve many social challenges in the future.

① Data used by enterprises for analysis



(Source) Ministry of Internal Affairs and Communications (2020) "Survey on Current Status of Measurement and Utilization of Economic Values of Digital Data"

② Enterprises' utilization of digital data



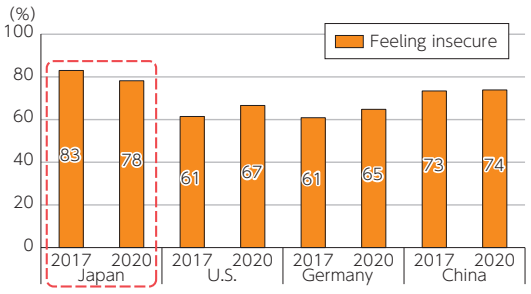
*Survey conducted in March 2020.

(Source) Ministry of Internal Affairs and Communications (2020) "Survey on Consumers' Consciousness of Data Utilization Environment"

(2) Future Personal Data Utilization / (3) Cybersecurity in 5G Age

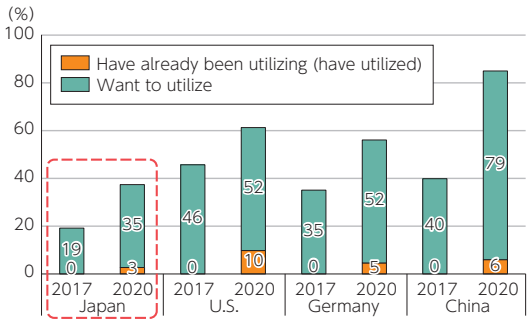
◯As Japan has launched personal data trust bank certification and other initiatives, the number of consumers feeling insecure about the provision of personal data has declined from three years earlier, reversing an upward trend (①).
◯In the future, personal data trust banks, personal data stores (PDS) (②) and anonymously processed data are expected to be utilized further.
◯It is also important to respond to new cybersecurity risks, including those accompanying 5G networks and supply chains.

① Insecurity about providing personal data when using services or applications



(Source) Ministry of Internal Affairs and Communications (2020) "Survey on Consumers' Consciousness of Data Utilization Environment"

② Consumers' intentions to utilize personal data trust banks or personal data stores



2017: n=1030, 2020: n=1000

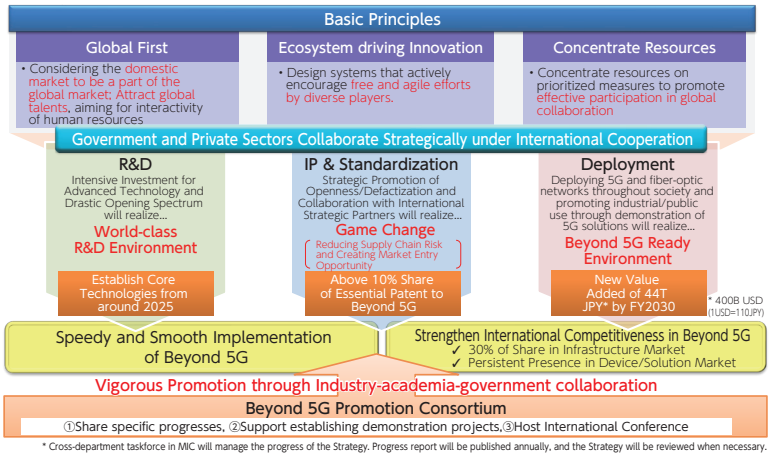
(Source) Ministry of Internal Affairs and Communications (2020) "Survey on Consumers' Consciousness of Data Utilization Environment"

Key Points

Chapter 4
Beyond 5G

◯Developed countries have already launched "Beyond 5G" initiatives towards the 2030s.
◯As government and private sectors should be united to strategically tackle Beyond 5G initiatives under international cooperation, the government formulated a Beyond 5G Promotion Strategy during the summer of 2020(①).
◯Japan should enhance research and development capabilities primarily for technologies related to its strengths or proactive initiatives (including terahertz waves, all-Photonics networks, quantum cryptography, sensing technology, and low-power consumption semiconductors) to secure its international competitiveness.

① Beyond 5G Promotion Strategy – Overview --



Part 2
Basic Data and Policy Directions

Chapter 5
Basic Data on the ICT Field

- Domestic production values of ICT industry (Year 2018, nominal) — **99.1 trillion yen** 9.8% of all industries
- Number of employment in ICT industry (Year 2018) — **4.045 million** 5.7% of all industries
- Contribution rate of ICT industry to real GDP growth rate (Average of Year 2012 - 2018) — **40.8%**
- ICT investment in Japan (Year 2018, real (Year 2011 values)) — **12.7trillion yen** 14.8% of all corporate capital investment
- Trade value of ICT goods and services (Year 2018, nominal) — **Import** 12.8 trillion yen **Export** 8.7 trillion yen
- Research spending on ICT industry (FY 2018) — **3.9 trillion yen** 27.4% of all corporate research spending
- Researchers on ICT industry (FY 2018) — **176 thousand** 34.8% of all corporate researchers
- Labor productivity in communications industry (FY 2018) — **13.347 million yen**
- Size of Japanese content market (Year 2018) — **11.9 trillion yen**
- Export value of Japanese broadcast content (FY 2018) — **51.94 billion yen**

- Fixed-line telephones ownership rate (households) (Year 2019) — **69.0%**
- Smartphones ownership rate (individuals) (Year 2019) — **67.6%**
- Internet usage rate (individuals) (Year 2019) — **89.8%**
- SNS usage rate (individuals) (Year 2019) — **69.0%**
- State of cloud service usage (Used at least by some offices or divisions, Year 2019) — **64.7%**
- State of Introduction of IoT/AI (Introduction rate, Year 2019) — **14.1%**
- Fixed-line broadband services subscriptions (End of FY 2019) — **41.2 million**
- Mobile communication services subscriptions (End of FY 2019) — **186.61 million**
- Internet traffic in Japan (Nov. 2019, Download) — **12.7 Tbps**
- Subscribers to broadcasting services (End of FY 2018) — **80.386 million**
- Time spent watching TV (real-time) (Jan. 14 - 19, 2020, weekday, per day) — **161 minutes**
- Time spent using the Internet (Jan. 14 - 19, 2020, weekday, per day) — **126 minutes**

Chapter 6
ICT Policy Directions

Promoting Comprehensive Strategies

In June 2019, the IT Strategic Headquarters established the "New IT Policy Principles for the Digital Age". In the same month, the Cabinet endorsed the "Declaration to be the World's Most Advanced Digital Nation: A Basic Plan for the Advancement of Public and Private Sector Data Utilization". Also in the same month, the government enacted the "Growth Strategy Action Plan", by Cabinet decision.

Developments in Telecommunication Policy

MIC consulted with a comprehensive review of competition rules and related topics in the telecommunications field. The special subcommittee examined measures deemed to be necessary regarding telecommunications into the future, based on network topologies that will exist in and around 2030 and compiled an interim report in August 2019 about the directions of these policy efforts and a final report in December 2019.

Developments in Radio Policy

MIC took measures for 5G implementation; promotion of effective radio spectrum use; realization of Public Safety LTE (PS-LTE) networks; approaches to build-out of base stations; and establishment of radio usage environments, etc.

Developments in Broadcasting Policy

MIC has held a roundtable meeting with the Minister for Internal Affairs and Communications, since November 2015. MIC promoted development of broadcast services as 4K and 8K broadcasting; took measures for strengthening the disaster resilience of broadcast networks, and promoted exports of broadcasting contents; etc.

Promoting Cybersecurity Measures

MIC conducted examinations of action plans for cybersecurity and developed cybersecurity policy, etc. MIC set up the Task Force", consisting of security experts, in January 2017. It released "IoT/5G Security Comprehensive Measures 2020" in July 2020.

Promoting ICT Use and Application

MIC took measures for realization of a symbiotic society; promoted telework; promoted ICT application in education, medicine, and other fields; developed policies for local development using ICT infrastructure; and took measures for creating environments where everyone can enjoy convenience through ICT, etc.

Promoting ICT Research and Development

MIC developed R&D strategies; enhanced R&D to realize cutting-edge ICT in all aspects of society; took measures for the assistance for creating innovation using competitive funding, etc.

Promoting International Strategies for ICT

Under the direction of the Minister for Internal Affairs and Communications, the "MIC Overseas Deployment Action Plan 2020" was established in April 2020. MIC took actions to support the overseas deployment of Japanese technology in the ICT; approaches of various forms of contributions and cooperation at multilateral and bilateral venues.

Promoting Public Administration and Disaster Prevention through ICT

MIC promotes e-government and informatization in the field of disaster-resilience.

Developments in Postal Service Administration

MIC focuses on assisting introduction of postal systems mainly in developing countries using Japan's outstanding know-hows of postal operations.