Key Points of the 2018 White Paper on Information and Communications in Japan

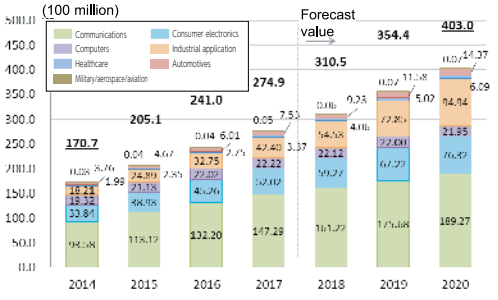
Key Points

Part 1
Special Theme — Sustainable Growth Through ICT in an Era of Population Decline

Chapter 1
ICT in Japan and the World

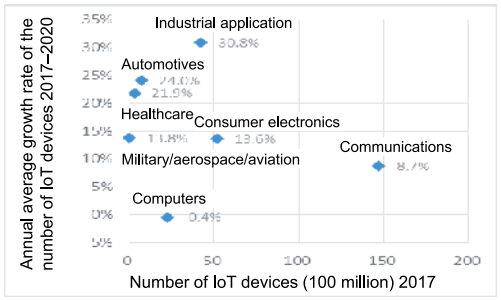
◯The number of IoT devices is about 27 billion in the world in 2017. It is expected to reach 40 billion in 2020.

Transition and forecast of the number of IoT devices in the world



(Source) IHS Technology

Number and growth rate forecast by field/industry of IoT devices in the world



(Source) IHS Technology

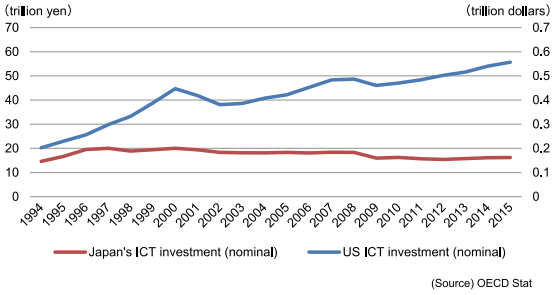
◯Compared to the United States, the amount of ICT investment in Japan is small, so the ICT capital stock also remains on the same level.

◯The total factor productivity* which could be affected by ICT and the ICT capital stock have contributed to Japan's GDP growth (an increase in value added) to a certain extent, but the level of contribution had been low compared to the United States until 2010.

*Total factor productivity (TFP): Factors other than capital and labor which contribute to production growth. Specifically, factors such as technological progress and efficiency improvement which could be affected by ICT.

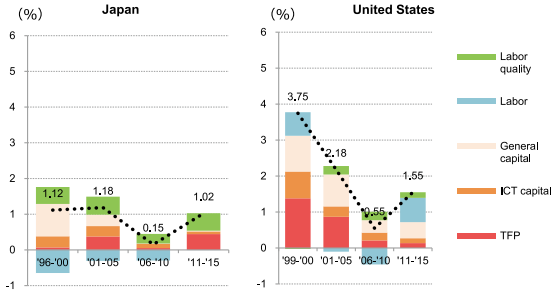
◯When comparing the rates of contribution of the ICT industry and other industries to Japan's growth rate, industries other than the ICT industry are found to be contributing little to pushing up the TFP.

Transition in ICT investment amounts (nominal) in Japan and the United States

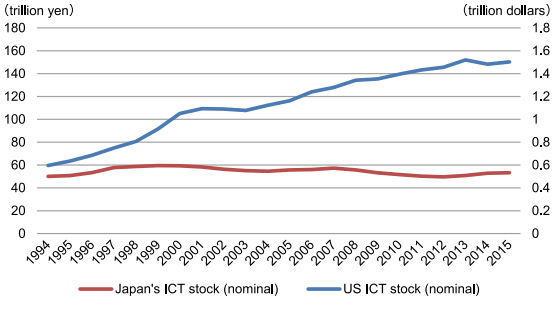


(Source) OECD Stat

Breakdown of contribution to the GDP growth rate in Japan and the United States

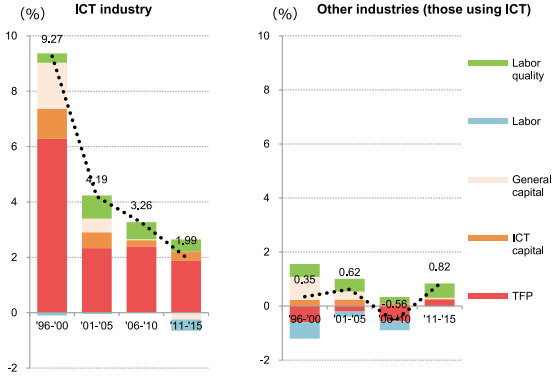


Transition in ICT capital stocks (nominal) in Japan and the United States



(Source) OECD Stat

Breakdown of contribution to the growth rate by industry in Japan



Chapter 2
Formation of New Economies Through ICT

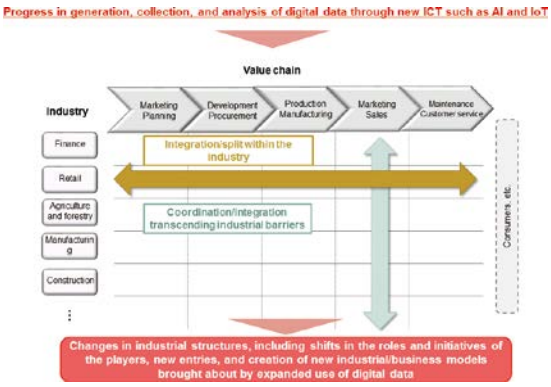
Key Points

◯Due to the transformation brought about by AI and IoT, changes are occurring in the mutual relationship between companies and industries also in the market.
◯"X-Tech," which creates new values and systems by providing solutions using ICT, has made progress. It is spreading to various fields including financial services that are becoming increasing digitized (FinTech).
◯The progress in X-Tech has promoted coordination and integration beyond industries and value chains (processes that create the value added). As a result, industrial structures have changed and mutual entry between different industries increased, and new markets have started to be formed transcending industries.
◯Cross-sectoral services beyond the conventional industrial frameworks have advanced, such as FinTech companies that provide asset management or automatic saving services by accessing customer information held by financial institutions.

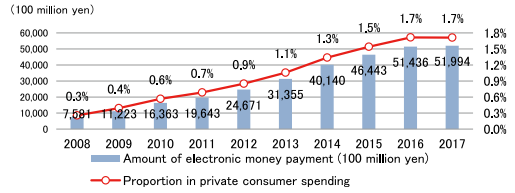
Major FinTech services

Category	Business type	Field/function provided	Typical example of a FinTech service
Operations	Banking	Deposit/asset management	PFM (Personal Financial Management), virtual banks
		Loan	P2P lending, social lending, crowdfunding
	Card	Payment	Mobile payment, online payment, mobile POS, automatic payment
		Money transfer	Online money transfer, P2P transfer
	Securities	Investment/asset management	Robo-advisor, online securities, FP (financial planner)
Infrastructure	Business support		Big data analysis, security, crowd-type accounting/labor consulting services
	Currency/payment networks		Virtual currency payment/exchange, decentralized exchange (blockchain)

Impact of X-Tech on market structure changes

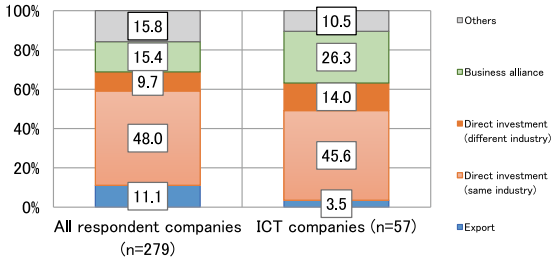


Transition in the Amount of Electronic Money Payment

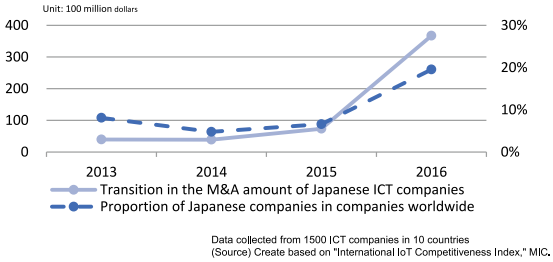


◯In order to supplement the shrinking domestic demand resulting from the population decline, it is important to capture global demand, mainly demand in emerging countries that continue to grow.
◯As a result of a questionnaire survey of ICT companies, the means of overseas expansion they desire to frequently use in the future was direct investment (same industry).
◯ICT companies' M&As overseas in 2016 amounted to 36.7 billion dollars.
◯To boost the number of inbound visitors that have increased in recent years, ICT can contribute in such areas as providing Japanese content overseas, improving the receiving environment (providing Wi-Fi access, providing multilingual signage/communication, etc.).

Companies' means of overseas expansion (questionnaire survey result; the means desired to be used frequently in the future)

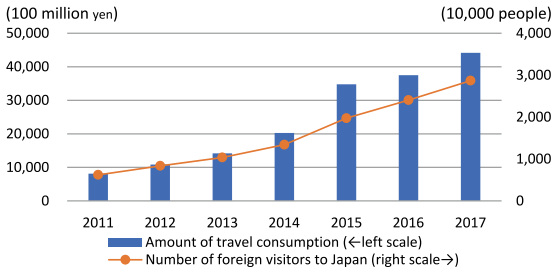


Transition in the M&A amount of ICT companies (the amount for Japanese companies and its proportion in the world's ICT sector)

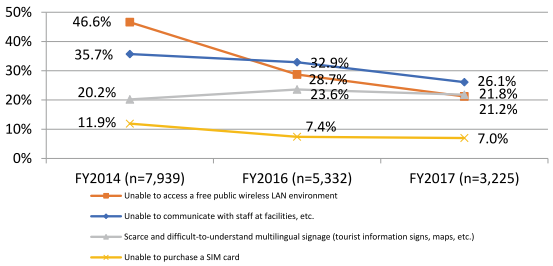


Data collected from 1500 ICT companies in 10 countries
(Source) Create based on "International IoT Competitiveness Index," MIC.

Transition in the number of foreign visitors to Japan and their consumption amount



Difficulties faced by foreign visitors to Japan during travel (extract)

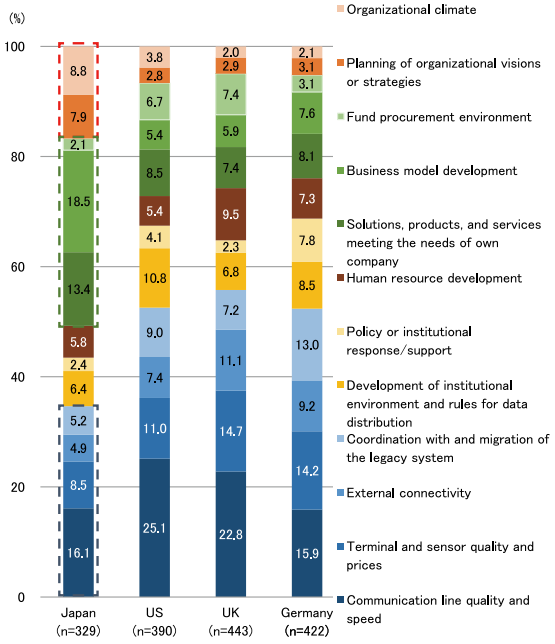


Key Points

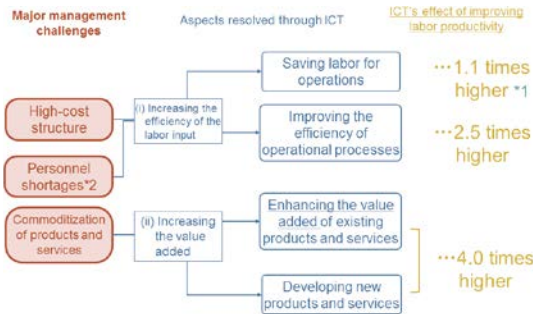
Chapter 3
Productivity Improvement and Organizational Reform Through ICT

◯As challenges facing utilization of AI and IoT, Japanese companies mentioned challenges concerning information and communications systems (the left figure below: the part enclosed in blue broken lines) less frequently than European and US companies, but mentioned challenges concerning business (the left figure below: the part enclosed in green lines) and organization (the left figure below: the part enclosed in red lines) more frequently than European and US companies.
◯The effect of improving labor productivity is particularly large for "aggressive ICT investment" centering on enhancement of the value added of existing products and services.

Challenges facing companies in various countries in utilizing AI and IoT



Categories of measures for resolving challenges and improving productivity through ICT

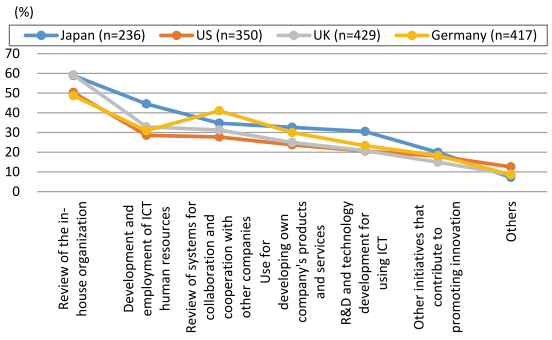


*1 According to a questionnaire survey, each group's labor productivity growth rate over a span of three years was as follows.
"Saving labor for operations": applicable (3.32%), not applicable (3.10%)
"Improving efficiency of operational processes": applicable (6.71%), not applicable (2.71%)
"Enhancing the value added of existing products and services," "developing new products and services": applicable (7.78%), not applicable (1.96%)

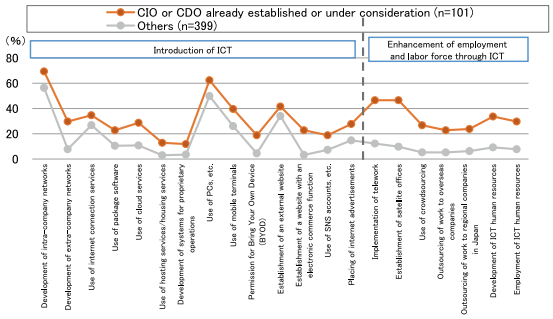
*2 The issue of promotion of labor force participation through ICT for resolving personnel shortages is discussed in Chapter 4 as an issue related to *people*.

◯In order to realize "aggressive ICT investment", organizational reform for bringing out the potential of ICT is also indispensable.
◯To that end, organizational reform needs to be carried out centering on establishment of a CIO or CDO who will lead the introduction and utilization of ICT in business activities.
◯Companies that have established or are considering establishing a CIO or CDO tend to have a higher ICT introduction rate and be actively engaging in efforts to increase employment or labor force through use of ICT.

Efforts to capitalize on ICT investment



State of efforts of domestic companies to increase employment or labor productivity through use of ICT



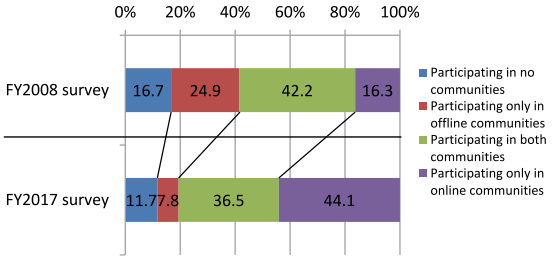
Chapter 4
Promotion of Inclusion Through ICT

Key Points

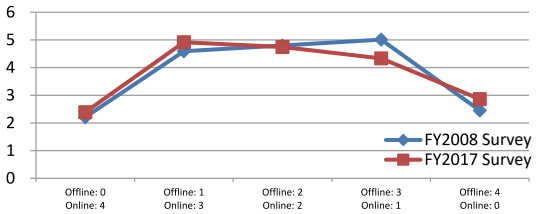
◯In a survey on participation in communities, people who do not participate in communities decreased while those who participate only in online communities increased compared to the results of the FY2008 survey.However, the tendency that people who participate in both offline and online communities have a strong ability to connect with others has not changed.

◯Among people who want to help others in the community, more than 40% had an intention to participate in mutual assistance systems that use social media. There are case examples of initiatives to support mutual assistance by making challenges facing residents and their intention to provide assistance visible through utilization of ICT such as social media.

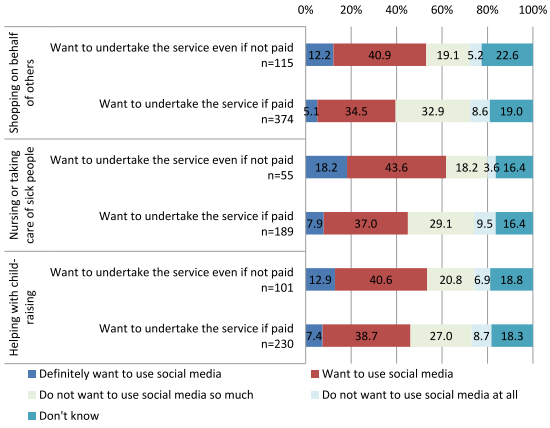
State of participation in online and offline communities



Networking ability index (if there are up to four communities to participate in)



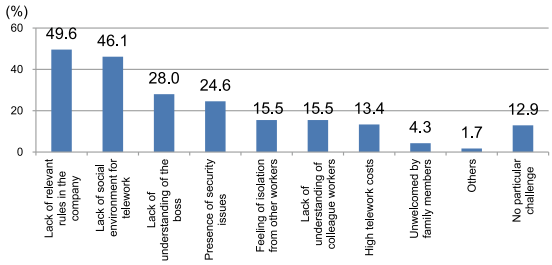
Intention to use social media (breakdown of people who want to help others)



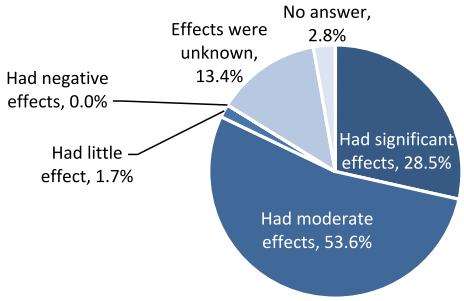
◯The telework dissemination rate for companies was 13.9% in 2017. While there may be challenges such as a lack of relevant rules in companies, telework has an advantage of improving the work-life balance for workers and improving labor productivity for companies (companies that experienced an improvement effect: 82.1%).

◯Crowdsourcing is a system where individuals or groups undertake orders made by companies or other such entities. Through use of ICT, crowdsourcing also contributes to promoting labor force participation of diverse people including women and creating jobs in rural areas. The number of people registered for crowdsourcing services has been on an increase.

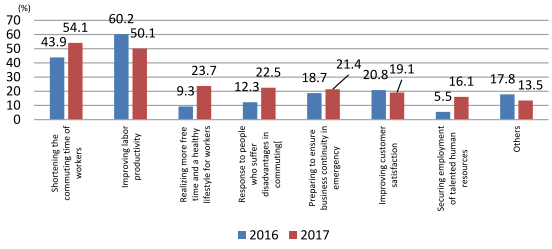
Challenges facing implementation of telework (workers wishing to telework)



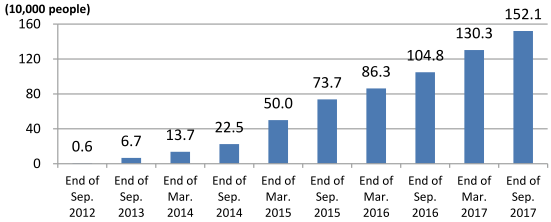
Improvement of productivity through telework (companies that aimed to improve productivity)



Purpose for introducing telework (companies that already have introduced telework)



Transition in the number of people registered for crowdsourcing services (the number of members of CrowdWorks Inc.)



Key Points

Part 2
Basic Data and Policy Directions

Chapter 5
Basic Data on the ICT Field

ICT industry trends

○The market size of Japan's ICT industry was 94.4 trillion yen, accounting for the largest market share among all industries at 9.6%.

○With regard to the real GDP of Japan's major industries in 2016, the real GDP of the ICT industry accounted for 9.4% of that for all industries, following the commerce and real estate industries.

Figure: Market sizes of major industries (based on nominal domestic production) (2016)

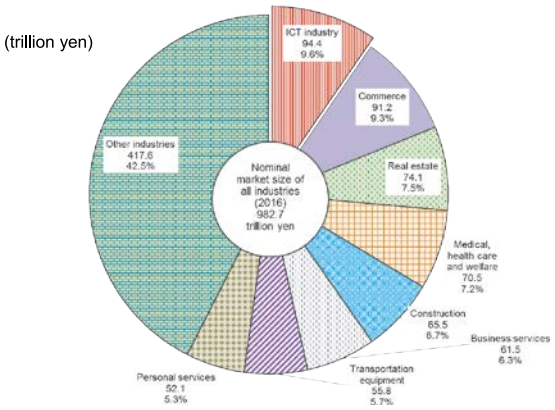
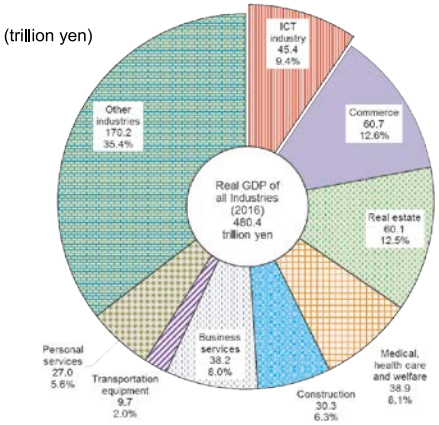


Figure: Real GDP of major industries (2016)



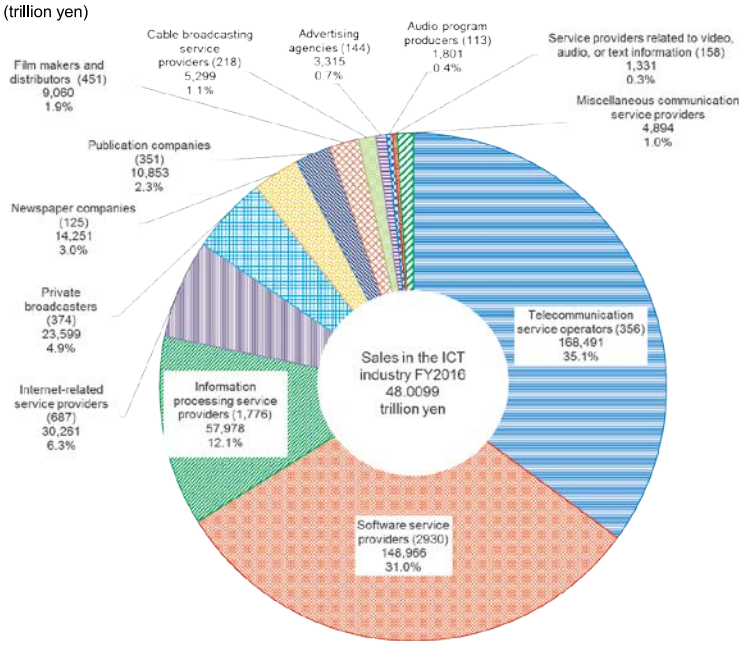
Research and development of the ICT industry

○The ICT industry spent 3.6715 trillion yen on research in FY2016, accounting for 27.6% of all corporate research spending. The ICT industry employed 182,976 researchers, or 31.2% of all corporate researchers in Japan.

State of ICT business operations

○The number of companies engaged in ICT business stood at 5,519, and their sales amount for FY2016 was 48.0099 trillion yen.

Figure: ICT industry sales



Internet usage trends

○The Internet penetration rate as a percentage of Japan's total population in 2017 was 80.9%. As for the state of penetration of ICT devices among households, the penetration rate for smartphones reached 75.1%, exceeding that for computers.

Figure: Transition in the Internet penetration rate among the population

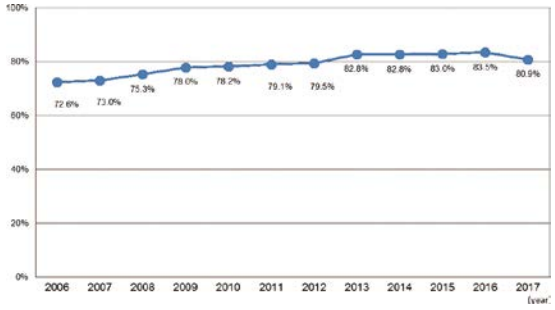
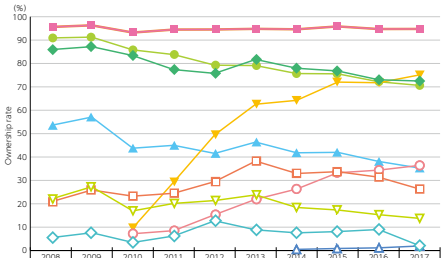


Figure: Transition in the penetration rate of ICT devices among households



	2008 (n=4,515)	2009 (n=4,547)	2010 (n=22,271)	2011 (n=16,530)	2012 (n=20,418)	2013 (n=15,599)	2014 (n=16,529)	2015 (n=14,765)	2016 (n=17,040)	2017 (n=16,117)
Fixed-line telephones	90.9	91.2	85.8	83.8	79.3	79.1	75.7	75.6	72.2	70.6
FAX	53.5	57.1	43.8	45.0	41.5	46.4	41.8	42.0	38.1	35.3
Mobile terminals	95.6	96.3	93.2	94.5	94.5	94.8	94.6	95.8	94.7	94.8
Smartphones	–	–	9.7	29.3	49.5	62.6	64.2	72.0	71.8	75.1
Computers	85.9	87.2	83.4	77.4	75.8	81.7	78.0	76.8	73.0	72.5
Tablets	–	–	7.2	8.5	15.3	21.9	26.3	33.3	34.4	36.4
Wearable devices	–	–	–	–	–	–	0.5	0.9	1.1	1.9
Home game consoles with Internet connectivity	20.8	25.9	23.3	24.5	29.5	38.3	33.0	33.7	31.4	26.3
Portable music players with Internet connectivity	22.0	27.3	17.0	20.1	21.4	23.8	18.4	17.3	15.3	13.8
Other appliances (information appliances) with Internet connectivity	5.5	7.6	3.5	6.2	12.7	8.8	7.6	8.1	9.0	2.1

Cloud service usage trends

○The percentage of companies using cloud services increased from 46.9% at the end of 2016 to 56.9%.

Figure: State of cloud service usage in Japan

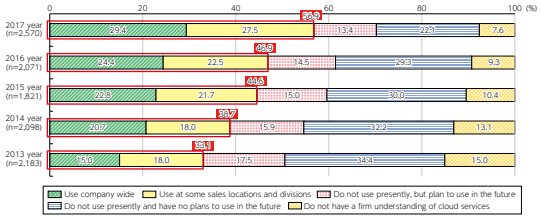
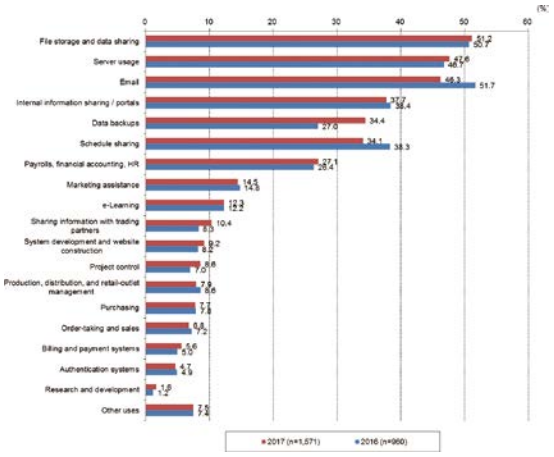


Figure: Breakdown of cloud service usage

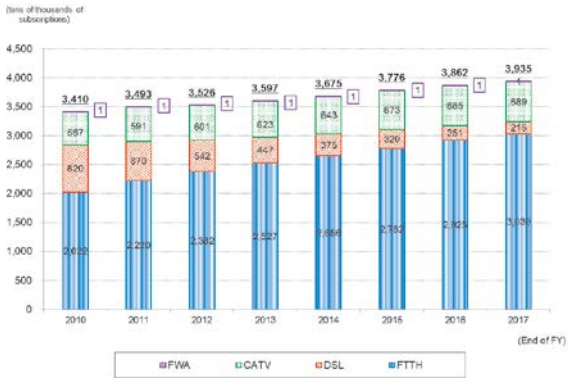


Telecommunication services

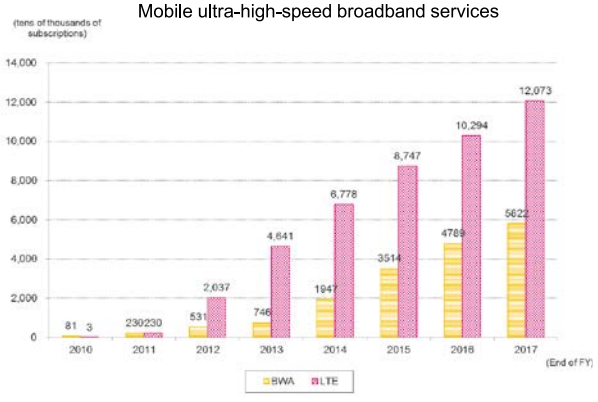
○The number of subscriptions to fixed-line broadband services at the end of FY2017 stood at 39.35 million. Subscriptions to mobile ultra-high-speed broadband services broke down into 120.73 million for 3.9G and 4G (LTE) services and 58.22 million for BWA services.

Figure: Transition in broadband service subscriptions

Fixed-line broadband services



Mobile ultra-high-speed broadband services



* Past figures differ from those published last year due to corrections made in service providers' reports.

Key Points

Broadcasting services and content market

◯The sales amount of Japanese broadcasters in FY2016 was 3.9312 trillion yen.
◯Japan's content market was valued at 11.6986 trillion yen, over 50% of which was attributable to video content, nearly 40% to text-based content, and nearly 10% to audio-based content.
◯The export value of Japanese broadcast content was 39.35 billion yen in FY2016.

Figure: Transition and breakdown of the market size (aggregate sales) of Japan's broadcasting industry

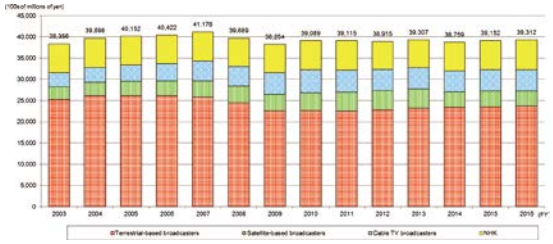


Figure: Export value of Japanese broadcast content

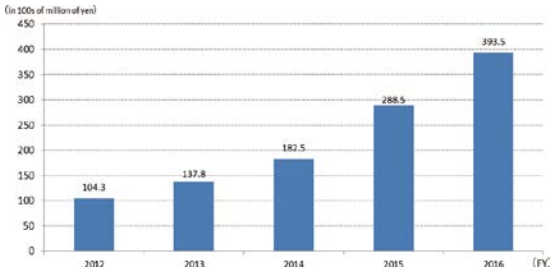
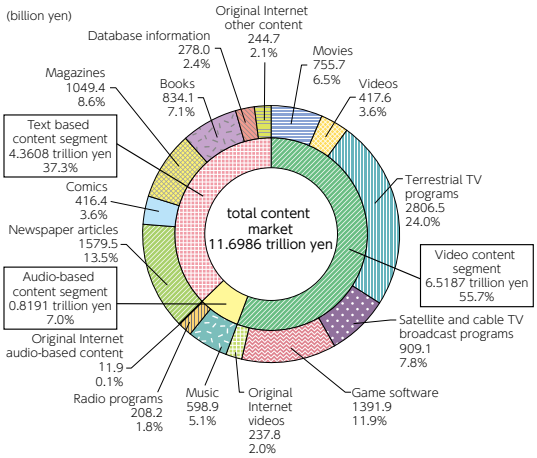


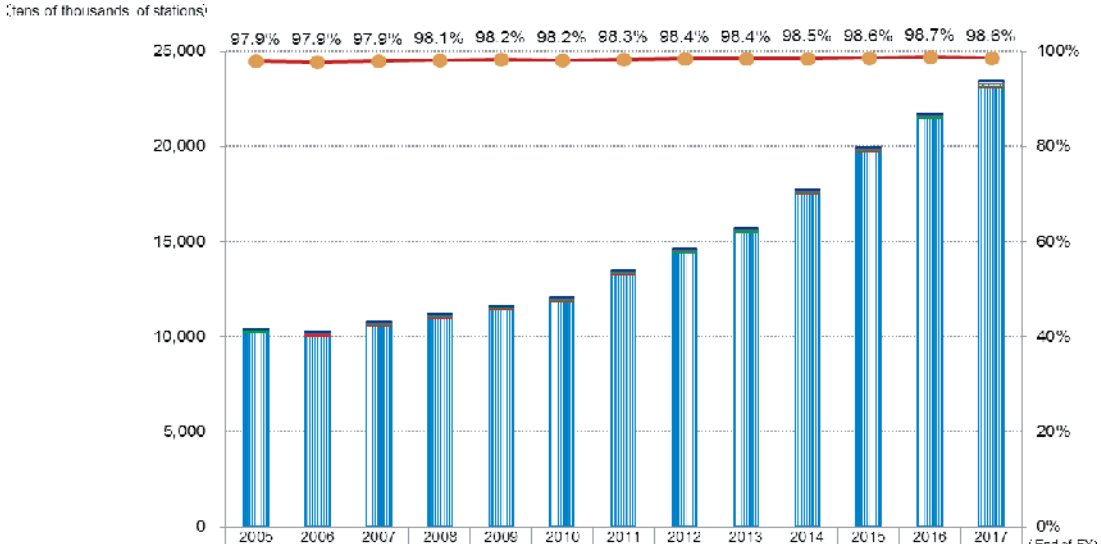
Figure: Breakdown of Japan's content market (2016)



Radio spectrum usage

◯The number of radio stations in Japan has been on an increasing trend, and the number of radio stations at the end of FY2017 was 234.45 million (7.9% increase over the previous year), including 231.09 million mobile phones and other land mobile stations (7.7% increase over the previous year) which accounted for a high 98.6% of all radio stations.

Figure: Transition in the number of radio stations



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Other	36	41	49	49	48	46	43	46	50	50	55	49	49
Base stations	62	62	63	41	41	54	58	63	68	71	70	73	125
Convenience stations*2	65	68	68	70	72	74	77	84	90	97	105	112	118
Amateur stations	56	53	51	49	47	45	44	44	44	44	44	43	43
Land mobile stations*1	10,212	10,059	10,573	10,983	11,448	11,878	13,266	14,380	15,472	17,493	19,711	21,457	23,109
Percentage of land mobile stations	97.9%	97.9%	97.9%	98.1%	98.2%	98.2%	98.3%	98.4%	98.4%	98.5%	98.6%	98.7%	98.8%

*1 "Land mobile stations" refers to a radio station that is operated either while in motion on land or while stationary in an unspecified location (such as mobile phones).
*2 "Convenience stations" refers to a radio station used for simple radio communications.

Chapter 6
ICT Policy Directions

Promotion of comprehensive strategies

○Approval of the 'Growth Strategy 2017' by the Cabinet in June 2017; establishment of the Board for Making the Future of the IoT New Era by the Information and Communications Council, MIC, in November 2017, and compilation of "TECH Strategy to Grab the Future" in June 2018

Developments in telecommunications policy

○Smooth transition of the fixed-line telephone network to IP network, promotion of mobile services, development of ultra-high-speed broadband infrastructure, assurance of fair competitive conditions in an IP network era, market verification in the telecommunications business field, ensuring safety and reliability of telecommunications infrastructure, development of a safe and secure usage environments for telecommunication services, etc.

Developments in radio policy

○Realization of the 5th generation (5G) mobile communication system, promoting effective radio spectrum use, promoting intelligent transport systems (ITS), research and development for realizing autonomous mobility systems, establishing radio usage environments, etc.

Developments in broadcasting policy

○Promoting 4K/8K broadcast services, encouraging distribution of broadcast content, advancements in broadcast services, strengthening the disaster resilience of broadcast networks, etc.

Promoting cybersecurity policy

○Examinations of execution plans for cybersecurity measures, strengthening cybersecurity measures, strengthening the framework for promoting cybersecurity measures, etc.

Promoting ICT use and application

○Promoting teleworking, promoting ICT use and application in the fields of education, healthcare, etc., regional development using information and communications infrastructure, development of an environment that enables anyone to enjoy convenience through ICT, developing cloud services, boosting productivity with ICT, etc.

Promoting ICT research and development

○Research and development of next-generation technologies related to artificial intelligence (AI), promoting research and development strategies, research and development of common IoT platform technologies, next-generation optical network technologies, and multilingual voice-based translation technologies, etc.

Promoting international strategies for ICT

○Promoting overseas adoption of the Japanese standard for terrestrial digital TV (ISDB-T), promoting adoption of Japanese ICT systems (disaster prevention, etc.) in Asia and Central and South America, and promoting various multilateral and bilateral contributions and cooperation

Promotion of administration and disaster prevention through ICT

○Promoting e-Government, and promoting digitization in the disaster prevention field

Developments in postal service administration

○Setting up the Post Office Revitalization Board in the Information and Communications Council in February 2018, and exerting efforts to support establishment of postal infrastructure systems based on Japan's excellent know-how on postal services in foreign countries