

Key Points of the 2015 White Paper on Information and Communications in Japan



Part 1 Looking Back at ICT's Progress

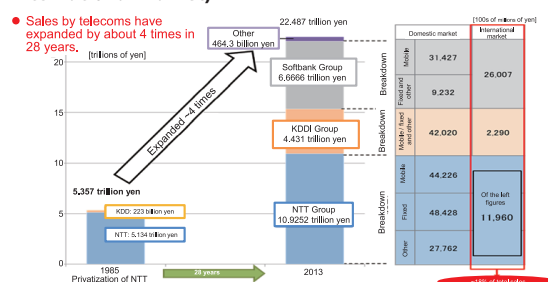
Chapter 1 Telecommunications Liberalization and Growth of the ICT Industry

- Since the telecommunications liberalization, Japan's ICT industry has experienced three major transformations: from "the age of the telephone" to "the age of the Internet and the mobile phone" and on to "the age of broadband and the smartphone."

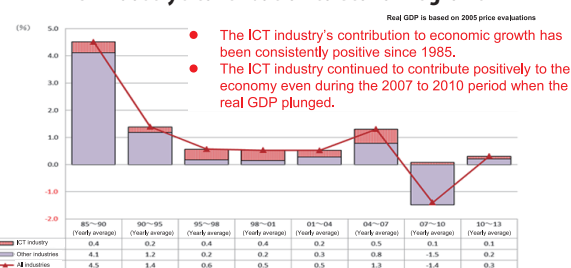
1985 – 1995 Age of the Telephone	1995 – 2005 Age of the Internet and the Mobile Phone	2005 – present Age of Broadband and the Smartphone
- Many new carriers entered the communications market. The added competition drove down prices and diversified services. - Policy issues included expanding new participation in various markets, establishing competition conditions between new common carriers (NCCs) and NTT, examinations of the state of NTT, and international trade problems (for example, U.S.-Japan discussions on car phone methodologies).	- Growth of the Internet caused huge structural changes in the information and communications industry. Mobile phones exploded in popularity and their functions grew increasingly sophisticated. - Policy issues included establishing interconnection rules for fixed-line communications, introduction of asymmetric regulations, relaxing regulations on market entry and fees, promotion of ICT applications (from infrastructure development to application promotion), and establishing usage environments.	- FTTH and 3G / LTE became widely accepted and IP networks increased. Smartphones appeared and immediately soared in popularity. - Policy issues included promoting ICT-driven growth strategies, aiding global expansion of the ICT industry, responses based on the Great East Japan Earthquake, assurance of equality between competing carriers and NTT East and West, promotion of competition in mobile communications, and consumer administration.
1890 • Telephone switchboard businesses start 1952 '53 • Nippon Telegraph and Telephone Public Corporation established '78 • Public Telecommunications Law enacted '78 • Kokusai Denshin Denwa Co. Ltd. established '78 • Eliminated backlog in subscriber telephones 1985 • Telecommunications liberalization '85 • Nippon Telegraph and Telephone Corporation established 1987 '88 '89 • Long-distance NCCs enter the long-distance phone market '88 '89 • Mobile communications NCCs start entering the market '88 '89 • International NCCs enter the international phone market '88 '89 • Satellite NCCs start satellite phone services '88 '89 • U.S.-Japan discussions on car phone methodologies 1990 • Telecommunications Council final report on the state of NTT and policy measures established '91 • NTT Docomo established '92 • Long-distance NCCs complete nationwide networks '92 • Long-distance NCCs implement end-to-end fees '93 • Commercial Internet services start '93 • Restrictions lifted on sales of mobile phones	1995 '96 '97 • PHS services launched '96 '97 • Public-private-public connections permitted '97 • Complete liberalization of international public-private connections '98 • Agreement on WTO basic telecommunications negotiations '98 • KDD law abolished '98 • Introduced connection accounting '99 • Switched from a fee licensing system to a reporting system '99 • Reorganized NTT '99 • Mobile Internet services start '99 • Act on Prohibition of Unauthorized Computer Access enacted '99 • ADSL services start 2000 • IT Strategy Council established '00 • U.S. and Japan governments agree on NTT connection fees '00 • Introduction of the Long-Run Incremental Cost (LRIC) model '00 • IT Basic Law enacted '00 • e-Japan Strategy established '00 • Asymmetric regulations and universal service system introduced '00 • National Broadband Initiative (policy to establish broadband by FY 2005) '03 • Provider Liability Limitation Law enacted '03 • Provision of FTTH services starts '04 • Act on the Protection of Personal Information enacted '04 • Abolished distinction between Type 1 and Type 2 carriers '04 • u-Japan Policy (general policy on establishing a ubiquitous-networked society by 2010)	2006 • Introduced mobile phone number portability '06 • Established policies to reform the communications and broadcasting fields by 2010 (Panel on the State of Communications and Broadcasting, government and ruling parties agreement on the state of communications and broadcasting, process program on reforms in the communications and broadcasting fields) '07 • Sales of smartphones begin '07 • Program to Strengthen ICT International Competitiveness (inclusive package to strengthen the international competitiveness of Japan's ICT industry) '08 • xiCT Vision (policy to use ICT to strengthen regional growth potential and global growth potential) '08 • Digital Japan Creation Project (ICT priority policy to overcome the economic crisis) '08 • Smart Ubiquitous Networked Society Strategy (general vision to further develop a ubiquitous-networked society) '08 • Issued guidelines on unlocking SIM locks '08 • Information and Communications Council report on "The State of the General Legal System on Communications and Broadcasting" 2010 • ICT Restoration Vision 2.0 (implementation of the Optical Highway) '10 • Revised the Broadcast Law and the Radio Law to respond to communications-broadcasting convergence '11 • Strengthened ICT disaster responses based on lessons from the Great East Japan Earthquake '11 • Information and Communications Council report on "Active Japan ICT Strategy" (state information and communications policy toward the implementation of a knowledge information society) '12 • ICT Growth Strategy (policies on creation of new value-added industries through data applications) '12 • Smart Japan ICT Strategy (basic strategy on economic growth and international contributions through ICT innovation) '13 • Establishment of systems for wholesale services for fiber-optic broadband connections and introduction of a system for cancelling initial contracts for telecommunications services '14 • Information and Communications Council report on "Active Japan ICT Strategy" (state information and communications policy toward the implementation of a knowledge information society) '15 • ICT Growth Strategy (policies on creation of new value-added industries through data applications) '15 • Smart Japan ICT Strategy (basic strategy on economic growth and international contributions through ICT innovation) '15 • Establishment of systems for wholesale services for fiber-optic broadband connections and introduction of a system for cancelling initial contracts for telecommunications services

- In the almost 30 years since the telecommunications liberalization, sales by telecommunications carriers have increased about 4 times and the ICT industry's market has expanded by about 2.4 times. The ICT industry has also been a consistent contributor to our economic growth.
- Competition among telecommunications carriers has slashed communication charges.

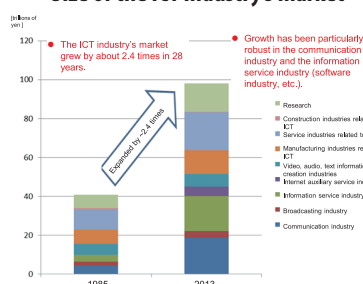
Sales by telecoms (total sales in the domestic market and international market)



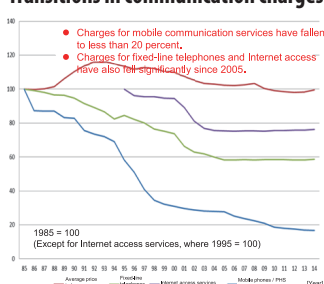
ICT industry's contribution to economic growth



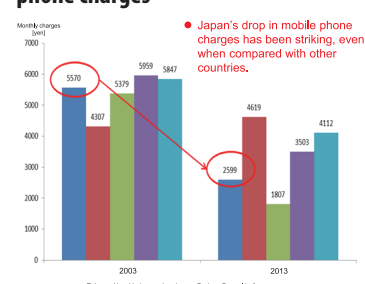
Size of the ICT industry's market



Transitions in communication charges



International comparison of mobile phone charges

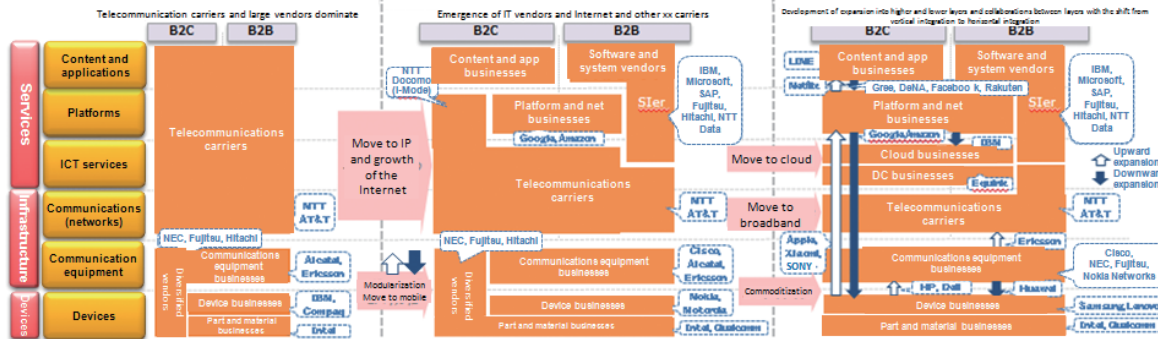


- The structure of the ICT industry had shifted from vertical integration to in-layer horizontal integration, but more recently, corporations have actively expanded into higher and lower layers and formed collaborations across layers.
- The profitability of layers is changing significantly as the modularization and commoditization of ICT devices continues.

Prior to 1995 : Vertical integration centering on fixed-line telephones

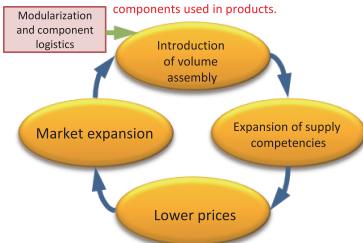
1995-2005 : Internet-driven convergence of communications and information

2005-present : Collaborations and competition through mobile and cloud



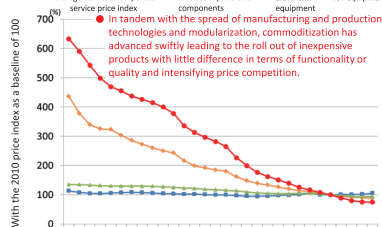
Advancement of modularization

- With the move to digital formats, modularization has advanced through, for example, the standardization of interfaces between components used in products.



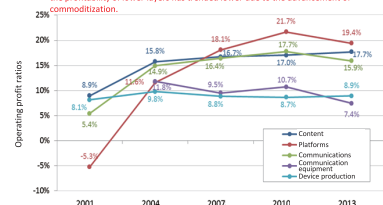
Advancement of commoditization

- Transition in the domestic price index for ICT devices
- In tandem with the spread of manufacturing and production technologies and modularization, commoditization has advanced swiftly leading to the roll out of inexpensive products with little difference in terms of functionality or quality and intensifying price competition.



Transitions in operating profit ratios by layer

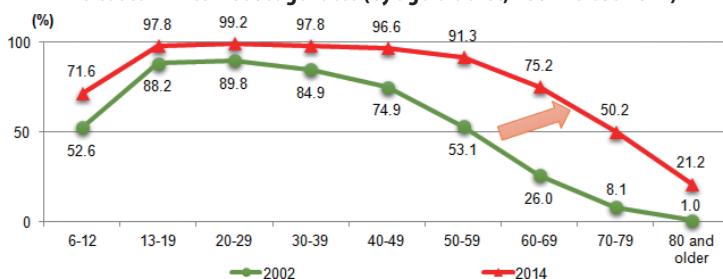
- Since 2000, the profitability of the communication and application layers has risen, while the profitability of lower layers has trended lower due to the advancement of commoditization.



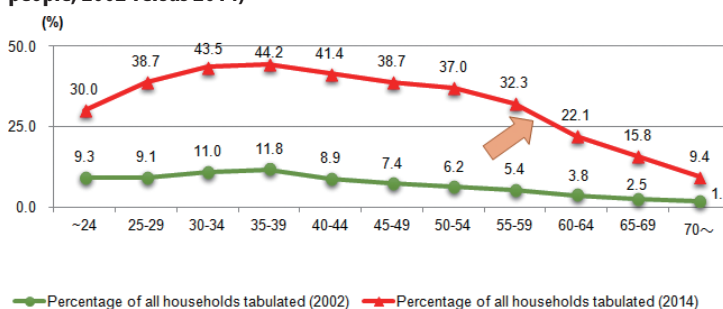
Chapter 2 Development of ICT Use and Application

- Beginning with Internet usage, the use and application of ICT has proliferated across generational lines over the past 10 years.

Increases in internet usage rates (by age bracket, 2002 versus 2014)

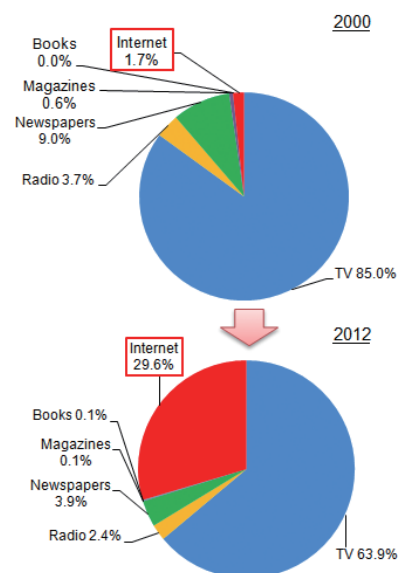


Net shopping rates by age of head of household (households of two or more people, 2002 versus 2014)



Increase in using the Internet to gather information

Transitions in the most frequently used media to follow news and current affairs

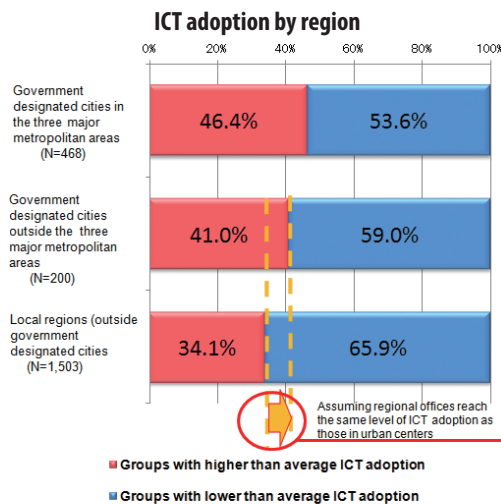


Part 2 Future Society Spearheaded by ICT

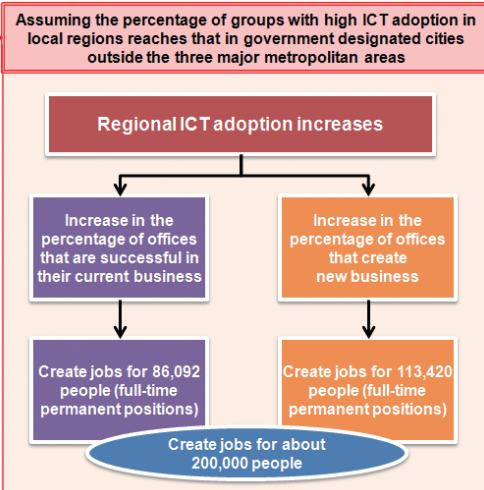
Chapter 3 ICT and the Future of Regions

Key Points

- Adoption of ICT at regional offices trails that in urban centers. Approximately 200,000 jobs could be created in rural areas if the level of regional ICT adoption approached that in urban centers.



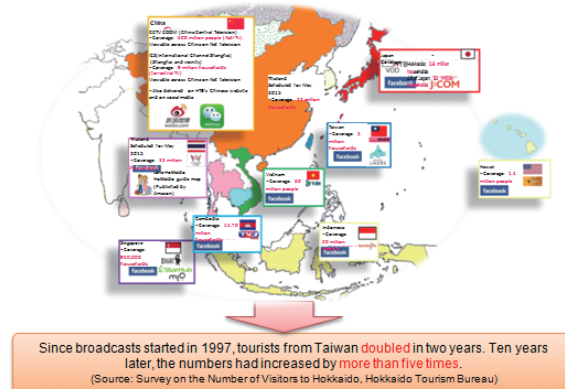
Employment creation driven by ICT adoption (rough calculation)



- ICT stimulates the exchange of information and goods across regional boundaries, which helps to increase both nonresident and resident populations.

Efforts to increase the nonresident population from abroad ("Hokkaido Hour" and "I Love Hokkaido" by Hokkaido Television Broadcasting)

Expansion of regions broadcasting "I Love Hokkaido"



Efforts to increase the resident population domestically (Satellite Office Project in Kamiyama, Tokushima)

Satellite offices that remodel old houses and warehouses

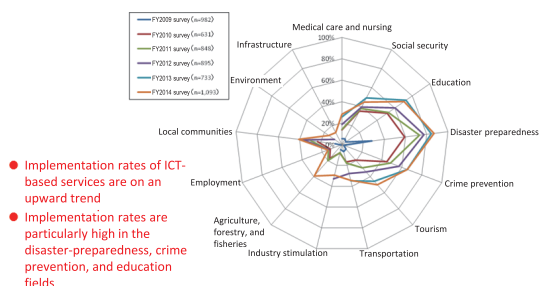


Specifically targets ICT venture businesses in Tokyo Metropolitan area

Twenty-six businesses moved 22 bases to four towns and cities in Tokushima (Kamiyama, Minami, Miyoshi, and Tokushima), creating 52 local jobs. Over a three-year period, 113 people in 76 households relocated to the prefecture (excluding the city of Tokushima).
In the town of Kamiyama, the inflow of people surpassed the outflow for the first time in 2011 since 1970 (over a three-year period, 81 people in 51 households moved to the town).

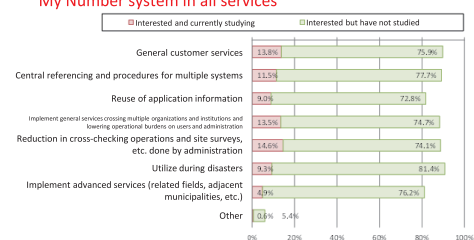
- Solid increase in implementation rates of services that use ICT, particularly for disaster preparedness, crime prevention, and the education field.
- Many local governments are actively implementing ICT for use with the My Number system.

Implementation rates of ICT-based services by administrative field



Services desired with the introduction of the My Number system

- More than 80 percent of local governments are interested in using the My Number system in all services



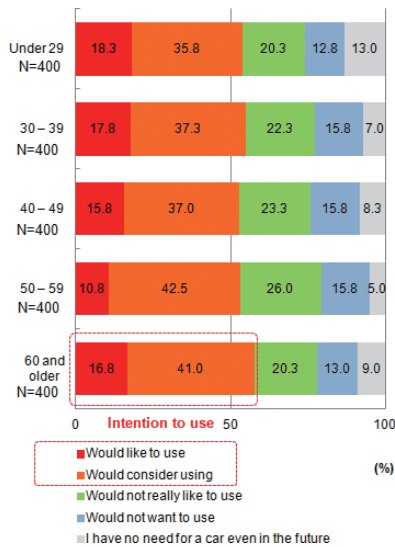
Chapter 4

ICT and Future Lifestyles

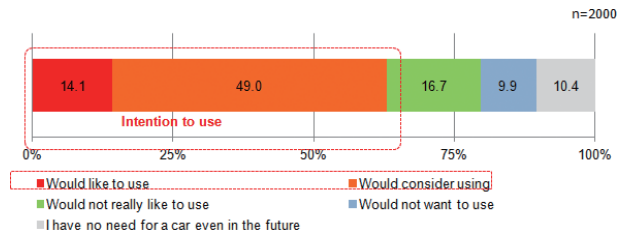
Key Points

- Seniors are very receptive to autonomous cars.
- While acceptance of caregiving robots is high, many people are psychologically resistant to the idea of child-raising robots.

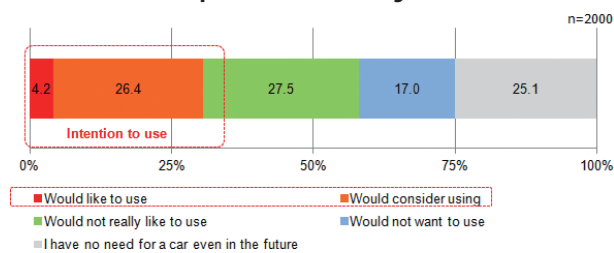
Acceptance of autonomous cars (by age)



Acceptance of caregiving robots



Acceptance of child-raising robots

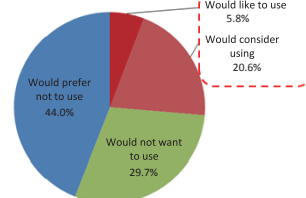


- The "sharing economy" is very active, in which individuals use social media to lend and rent vacant rooms and other unused assets. In Japan, currently there is some reluctance to make use of the sharing economy, but the sharing economy has the potential to expand in the future.

Intention to use in Japan

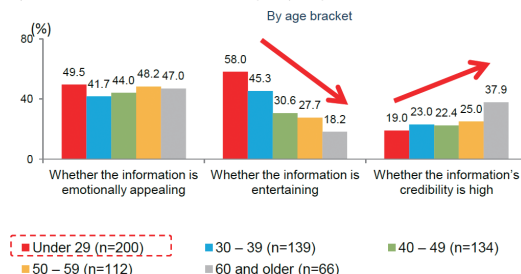
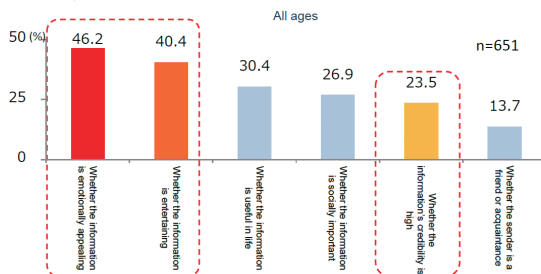
Example: Services that let you stay at a private individual's empty room, apartment, or house at a travel destination

- Only at around 30 percent overall



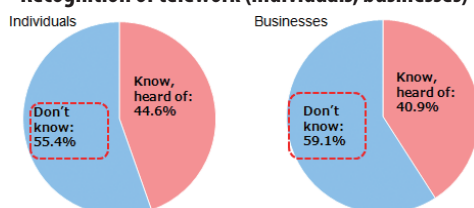
- "Flaming" incidents on social media are frequent and have become a social problem.
- When "sharing" information on social media, there is a tendency to choose information on its emotional or entertainment value rather than on its credibility.

Tendency to choose information on its emotional or entertainment value rather than on its credibility. This trend is more pronounced among the younger cohort.

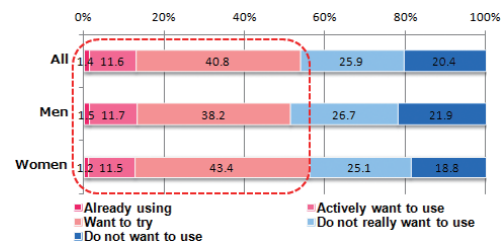


- Recognition of telework is low, but the latent needs are high. Therefore, further publicity is necessary.

Recognition of telework (individuals, businesses)



Intention to use telework



Chapter 5

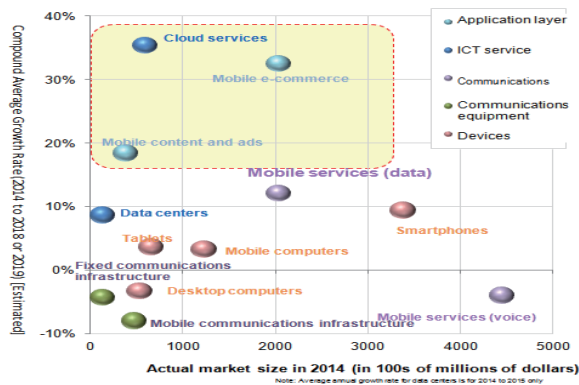
ICT and the Future of Industry

Key Points

- The global ICT market continues to expand, particularly in the cloud and application layer markets, backed by the growth of markets in developing countries and regions.
- Enterprises in various countries place importance on collaborations and partnerships with foreign enterprises for future international expansion.

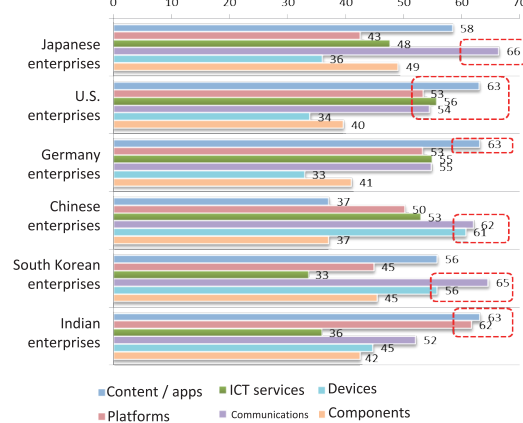
Scale and growth potential of main markets in each layer

Growth is expected particularly in cloud services and the application layer markets



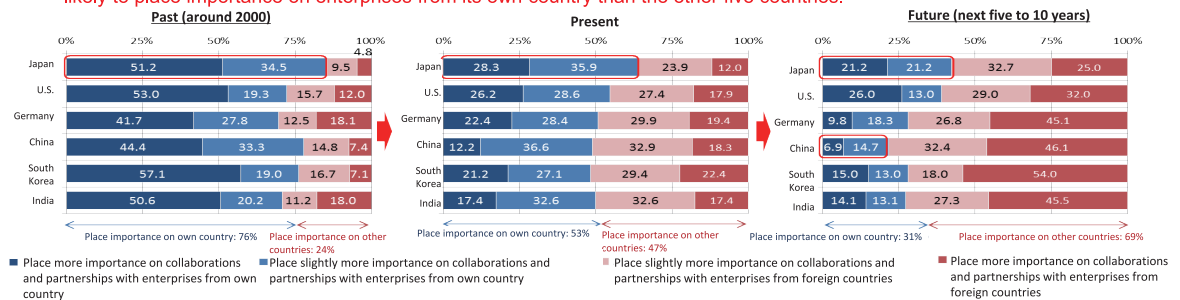
Perceptions of the competitiveness of own country's ICT industry

Japan, South Korea, and China perceive themselves to be competitive in lower layers, while the U.S., Germany, and India perceive themselves to be competitive in higher layers



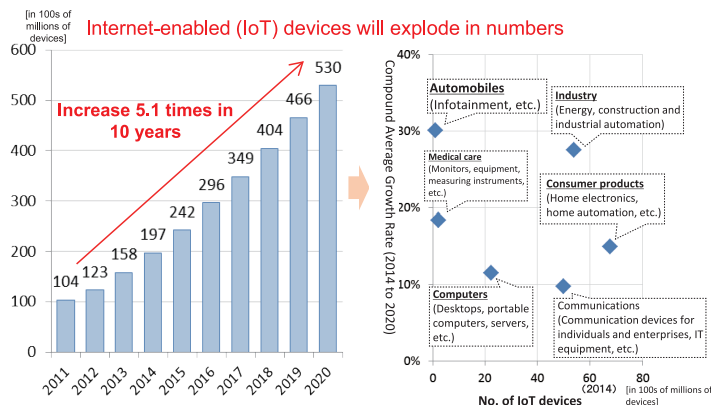
Nationalities of enterprises considered for future collaborations and partnerships

Enterprises in all countries place importance on collaborations and partnerships with foreign enterprises. Japan is more likely to place importance on enterprises from its own country than the other five countries.

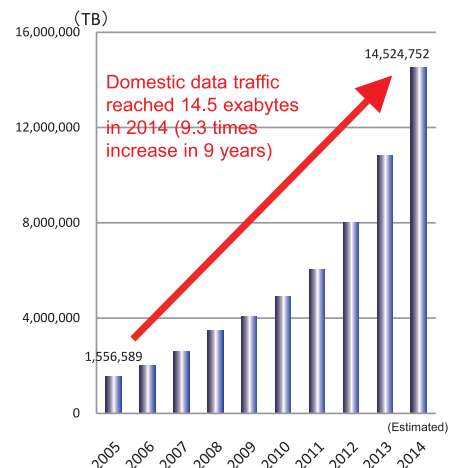


- The number of Internet-enabled (the Internet of Things (IoT)) devices is expected to explode in the near future.
- There are active developments to collect and analyze all kinds of data via the IoT and drive operational efficiencies higher.

Transitions and predictions in the number of devices connected to the Internet (IoT)



Transitions in domestic data distribution volumes



Part 3

Basic Data and Policy Directions

Chapter 7

Basic Data on the ICT Field

Key Points

ICT Industry Trends

- Japan's ICT industry was valued at 82.2 trillion yen, accounting for about 8.7 percent of all industries, the largest share of any industry. The ICT industry employed 4.04 million people, 7.1 percent of all industries in 2013.
- The ICT industry's real GDP accounted for 10.8 percent of Japan's real GDP from all major industries in 2013, making it the largest of all major industries.

Figure: Market sizes of major industries (based on nominal domestic production) (breakdown) (2013)

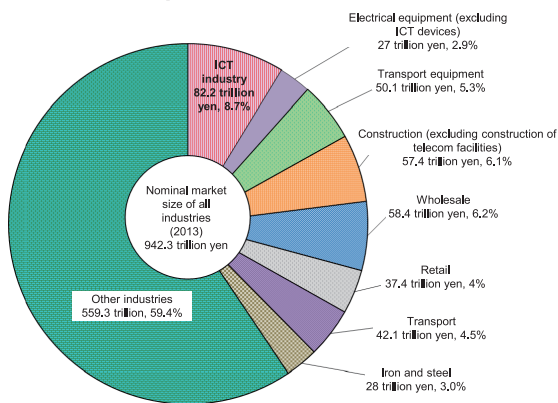
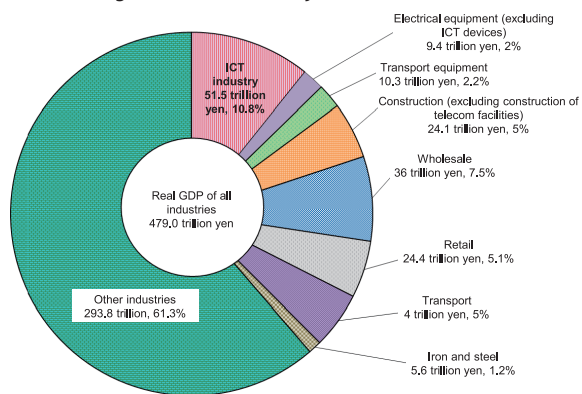


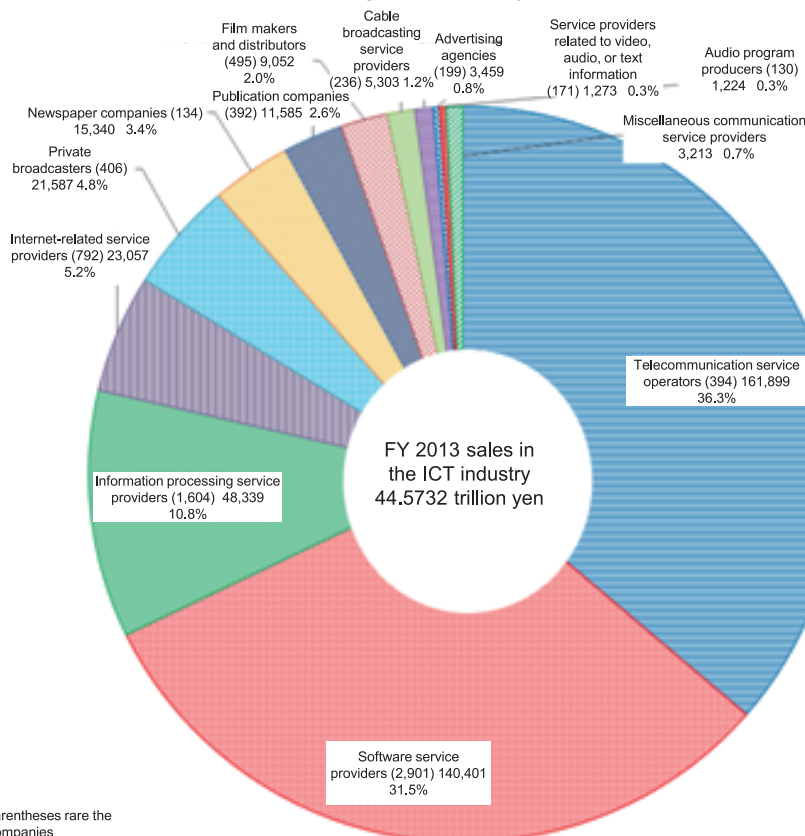
Figure: Real GDP of major industries (2013)



State of enterprises engaged in ICT business operations

- There were 5,639 enterprises engaged in ICT business operations, with FY 2013 sales of 44.5732 trillion yen.

Figure: ICT industry sales



Figures in parentheses are the number of companies
Units: billions of yen

Internet usage trends

- The number of Internet users at the end of 2014 rose 0.3 percent year-on-year to 100.18 million. The penetration rate among the general population was 82.8 percent, the same as last year-end. The percentage of households owning smartphones climbed 1.6 percentage points year-on-year to 64.2 percent.

Figure: Transitions in the number of Internet users and the penetration rate among the general population

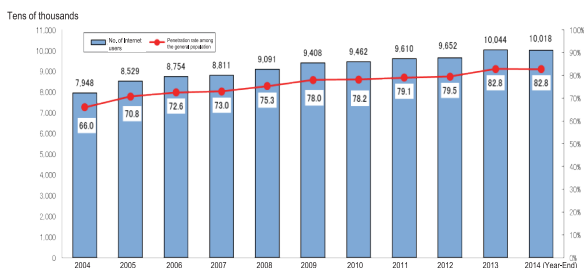
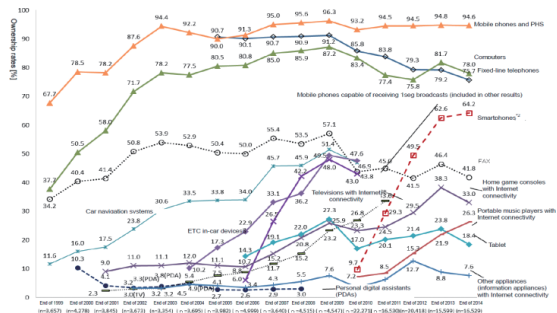


Figure: Transitions in household ownership rates for ICT devices



Cloud service usage trends

- The percentage of enterprises using cloud services at the end of 2014 rose to 38.7 percent from 33.1 percent at the end of 2013. The most commonly used service was file storage and data sharing.

Figure: State of cloud service usage in Japan

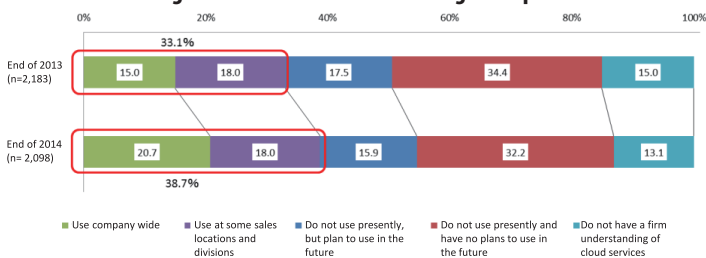
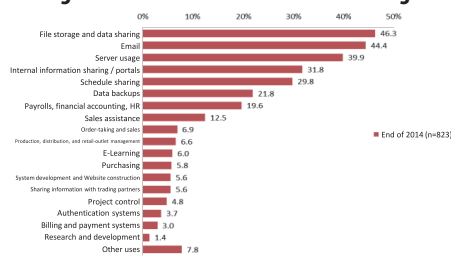


Figure: Breakdown of cloud service usage



Telecommunications business

- Sales in the telecommunications business in FY 2013 were 13.6384 trillion yen, with mobile communications accounting for more than half. By service category, the share for data transmission services has been rising year by year.
- Broadband development and usage in Japan are progressing every year. Ultra-high-speed broadband services were available at 99.9 percent of Japanese households at the end of March 2014.

Figure: Telecom carriers' sales ratios by fixed-line communications and mobile communications

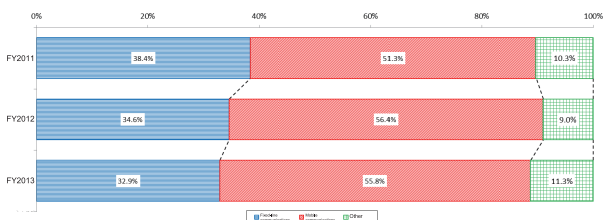


Figure: Transitions in sales ratios by service category

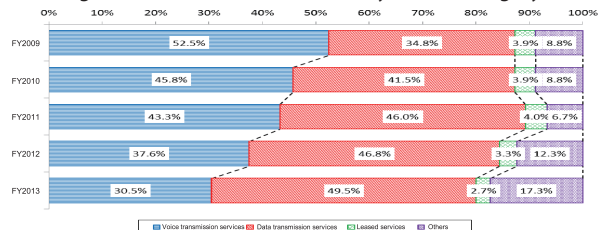
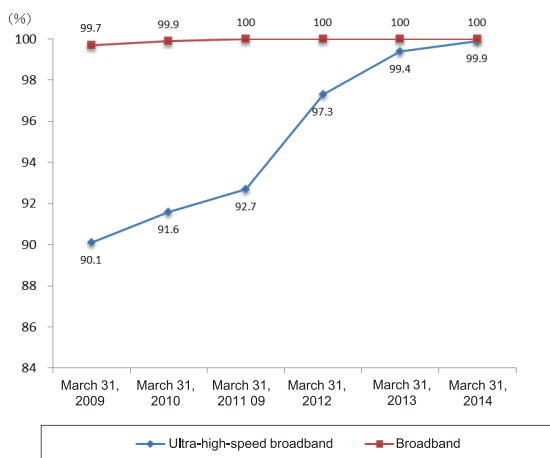


Figure: Transitions in the provision of broadband infrastructure



Broadcasting business and content market

- Broadcaster sales in FY 2013 were 3.9307 trillion yen. The share of terrestrial-based broadcasters continued to expand from the previous fiscal year.
- The Japanese content market was valued at 11.2951 trillion yen, which broke down to 52.9 percent from video content, 40.1 percent from text-based content, and 7.0 percent from audio-based content.
- The market for digital content for PCs or mobile phones was 2.344 trillion yen, accounting for 20.8 percent of the entire content market.
- The export value of Japanese broadcast content topped 13 billion yen in FY 2013.

Figure: Transitions in and breakdown of the broadcasting sector market size (total sales)

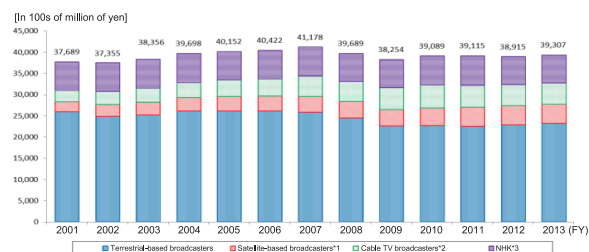


Figure: Breakdown of Japan's content market (2013)

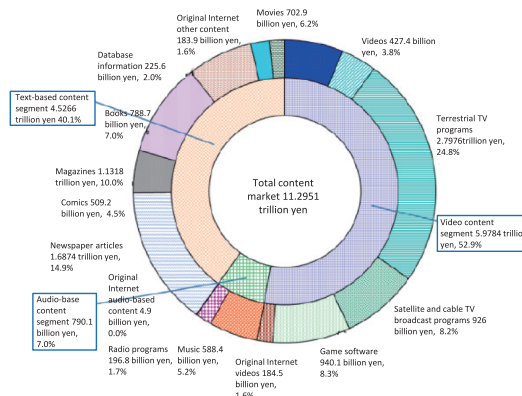
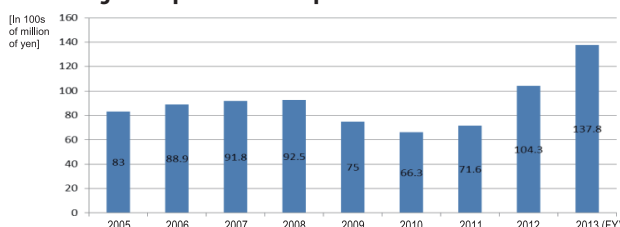


Figure: Export value of Japanese broadcast content



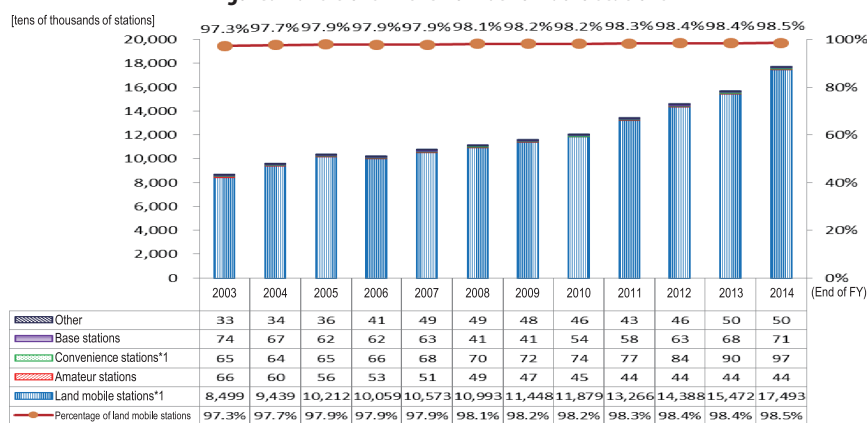
Note: Export value of broadcast content: total export value of program broadcast rights, Internet distribution rights, video and DVD rights, format and restaging rights, merchandising rights, and similar rights.

Note: From FY 2010 onward, the export value from other revenue streams has been included along with program broadcast rights in the export value of broadcast content. Figures prior to FY 2010 are the export value for program broadcast rights only.

Radio spectrum use

- The number of radio stations in Japan continued to increase, reaching 174.93 million at the end of FY 2014 (a year-on-year increase of 12.9 percent). This total included 174.93 million mobile phones and other land mobile stations (a year-on-year increase of 13.1 percent). This category accounted for a huge 98.5 percent of all radio stations.

Figure: Transitions in the number of radio stations



Note 1: "Land mobile station" 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).

Note 2: "Convenience station" refers to a radio station used for simple radio communications.

Research and development by the ICT industry

- The ICT industry spent 3.8078 trillion yen on research in FY 2013, accounting for 30.0 percent of all corporate research spending. The ICT industry employed 184,341 researchers, or 38.0 percent of all corporate researchers.

Chapter 8

ICT Policy Directions

Key Points

■ Comprehensive strategy promotions

- The Japanese government in January 2011 set up the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society (IT Strategic Headquarters), which undertakes various policies. In June 2014, the government revised the Declaration to be the World's Most Advanced IT Nation and its associated roadmap that defines each ministry's role and attainment targets.

■ Developments in telecommunications business policy

- MIC is promoting various policies in this area, including initiatives to further develop and expand world-leading ICT infrastructure, promoting mobile services, increasing the use of optical networks, revising consumer protection rules, and handling personal and user information.

■ Developments in radio policy

- MIC policies in this area include promoting effective radio spectrum use, examining 5G mobile communications systems, promoting advanced Intelligent Transport Systems, and establishing radio usage environments.

■ Developments in broadcasting policy

- Some of the MIC policy efforts in this area include encouraging the distribution of broadcast content, advancing broadcast services, and reinforcing broadcast networks.

■ Promoting ICT use and application

- MIC is promoting policies to use and apply ICT in a variety of fields, such as education, healthcare, regional development, training ICT personnel, and addressing global environmental problems.

■ Promoting ICT research and development

- MIC promotes research and development that will drive the next generation based on the Fourth Science and Technology Basic Plan (decided by the Cabinet in August 2011), which is Japan's basic policy for science and technology.

■ Promoting international ICT strategies

- MIC works to expand Japan's ICT overseas, such as encouraging the adoption of Japan's standard for terrestrial digital TV (ISDB-T) in other countries, as well as promotes various multilateral and bilateral contributions and collaborations.

■ Promotion of ICT application in administration and in fire and disaster preparedness

- In addition to promoting e-government, MIC is moving ahead with e-local governments by deploying cloud-based local government services.

■ Developments in postal service administration

- MIC ensures the universality of postal services while steadily promoting Japan Post privatization. MIC is also putting energy into the overseas deployment of postal infrastructure systems using Japan's superb postal business knowledge.