Attachment

(Unofficial translation)

2015 White Paper on Information and Communications in Japan (Outline)

July 2015

Ministry of internal Affairs and Communications

Structure of the Special Theme in the 2015 White Paper on Information and Communications in Japan

Special Theme: Past, Present, and Future of ICT

Part 1: Looking Back at ICT's Progress

Chapter 1: Telecommunications Liberalization and Growth of the ICT Industry

Section 1: 30 Years Since Communications Liberalization: System, Service, and Market Transitions	Section 2: 30 Years Since Telecommunications Liberalization: Overview From a Data Perspective	Section 3: Structural Changes in the ICT Industry

Chapter 2: Development of ICT Applications

Section 1: Proliferation of ICT Applications into Every Aspect of Life	Section 2: Growth of ICT Applications across Generational Lines	Section 3: Spread of ICT Applications on a Global Scale

Part 2: Future Society Spearheaded by ICT

Chapter 3: ICT and the Future of Regions

- Section 1: ICT and Regional Enterprises
- Section 2: ICT and Regional Employment
- Section 3: ICT and Regional Issues

Chapter 4: ICT and Future Lifestyles

- Section 1: New Forms of ICT Devices
- Section 2: Transformations Caused by the Growth of Social Media
- Section 3: New Work Styles Driven by ICT: Potential for Telework
- Section 4: ICT and the Olympic and Paralympic Games

Chapter 5: ICT and the Future of Industry

- Section 1: ICT and Future Issues for Japan's Economy
- Section 2: Global Trends in the ICT Industry
- Section 3: Perceptions and Projections of ICT Corporate Executives in Different Countries
- Section 4: Transformations in Economic Structures Caused by ICT Development

Chapter 6: Future Vision of 2030: Overcoming Population Decline and Revitalizing Local Economies in the Future by ICT

Section 1: Further Evolution of ICT	Section 2: Overcoming Population Decline and Revitalizing Local Economies in the Future by ICT

Note: In addition, Part 3 "Basic Data and Policy Directions" provides basic data on the ICT field and information on MIC's ICT policies.

Chapter 1: Telecommunications Liberalization and Growth of the ICT Industry (1)

1985 – 1995 Age of the Telephone

- 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).

1890	• Telephone switchboard businesses start
1952 '53 '78	• Nippon Telegraph and Telephone Public Corporation established • Public Telecommunications Law enacted • Kokusai Denshin Denwa Co. Ltd. established • Eliminated backlog in subscriber telephones
1985	• **Telecommunications liberalization** • Nippon Telegraph and Telephone Corporation established
1987 '88 '89	• Long-distance NCCs enter the long-distance phone market • Mobile communications NCCs start entering the market • International NCCs enter the international phone market • Satellite NCCs start satellite phone services • U.S.-Japan discussions on car phone methodologies
1990 '91 '92 '93 '94	• Telecommunications Council final report on the state of NTT and policy measures established • NTT Docomo established • Long-distance NCCs complete nationwide networks • Long-distance NCCs implement end-to-end fees • Commercial Internet services start • Restrictions lifted on sales of mobile phones

1995 – 2005 Age of the Internet and the Mobile Phone

- 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.

1995 '96 '97 '98 '99	• PHS services launched • Public-private-public connections permitted • Complete liberalization of international public-private connections • Agreement on WTO basic telecommunications negotiations • KDD law abolished • Introduced connection accounting • Switched from a fee licensing system to a reporting system • Reorganized NTT • Mobile Internet services start • Act on Prohibition of Unauthorized Computer Access enacted • ADSL services start
2000 '01 '03 '04	• IT Strategy Council established • U.S. and Japan governments agree on NTT connection fees • Introduction of the Long-Run Incremental Cost (LRIC) model • IT Basic Law enacted • e-Japan Strategy established • Asymmetric regulations and universal service system introduced • National Broadband Initiative (policy to establish broadband by FY 2005) • Provider Liability Limitation Law enacted • Provision of FTTH services starts • Act on the Protection of Personal Information enacted • Abolished distinction between Type 1 and Type 2 carriers • u-Japan Policy (general policy on establishing a ubiquitous-networked society by 2010)

2005 – present Age of Broadband and the Smartphone

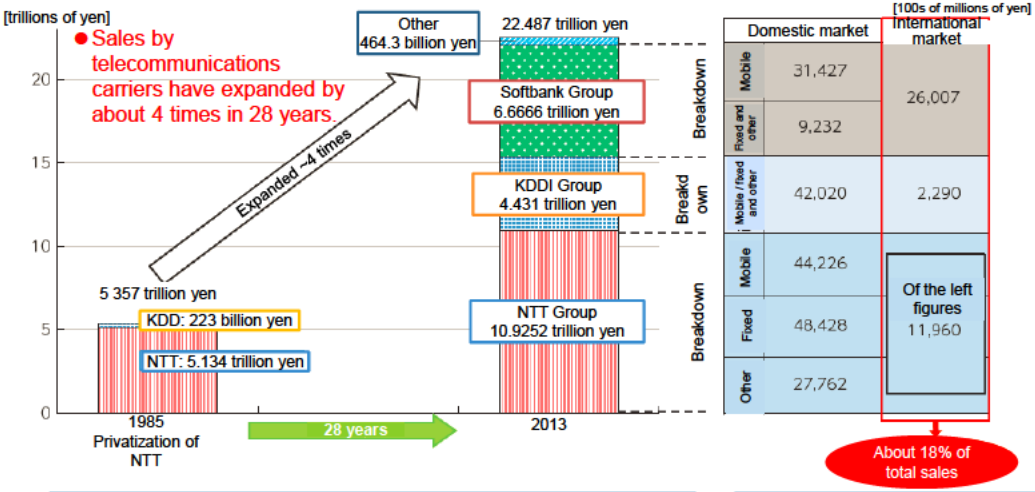
- FTTH and 3G / LTE became widely accepted and IP networks increased. Smartphones appeared and immediately soared in popularity.
- Policy issues included promoting ICT-driven growth strategies, aiding global expansion of the ICT industry, responses based on the Great East Japan Earthquake, assurance of equality between competing carriers and NTT East and West, promotion of competition in mobile communications, and consumer administration.

2006 '07 '08 '09	• Introduced mobile phone number portability • 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) • Sales of smartphones begin • Program to Strengthen ICT International Competitiveness (inclusive package to strengthen the international competitiveness of Japan's ICT industry) • xICT Vision (policy to use ICT to strengthen regional growth potential and global growth potential) • Digital Japan Creation Project (ICT priority policy to overcome the economic crisis) • Smart Ubiquitous Networked Society Strategy (general vision to further develop a ubiquitous-networked society) • Issued guidelines on unlocking SIM locks • Information and Communications Council report on "The State of the General Legal System on Communications and Broadcasting"
2010 '11 '12 '13 '14 '15	• ICT Restoration Vision 2.0 (implementation of the Optical Highway) • Revised the Broadcast Law and the Radio Law to respond to communications-broadcasting convergence • Strengthened ICT disaster responses based on lessons from the Great East Japan Earthquake • Information and Communications Council report on "Active Japan ICT Strategy" (state of information and communications policy toward the implementation of a knowledge information society) • ICT Growth Strategy (policies on creation of new value-added industries through data applications) • Smart Japan ICT Strategy (basic strategy on economic growth and international contributions through ICT innovation) • Establishment of systems for wholesale services for fiber-optic broadband connections and introduction of a system for cancelling initial contracts for telecommunications services

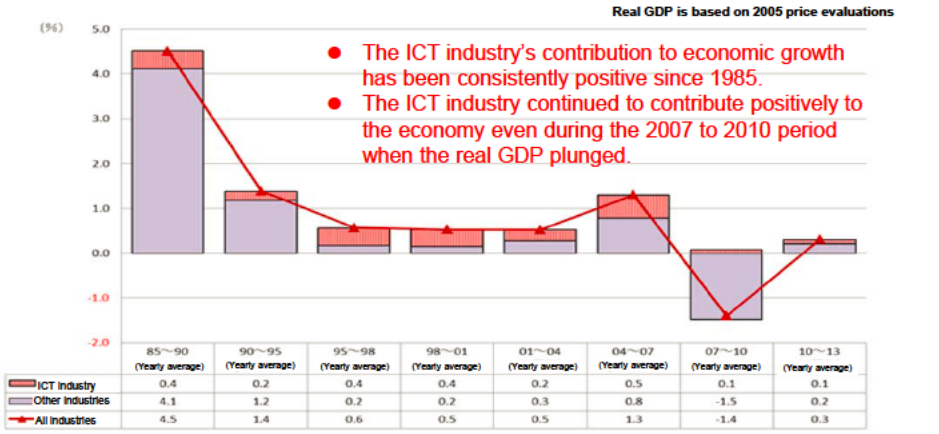
Chapter 1: Telecommunications Liberalization and Growth of the ICT Industry (2)

- In the almost 30 years since 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. Japan's communication charges are now among the lowest in the world.

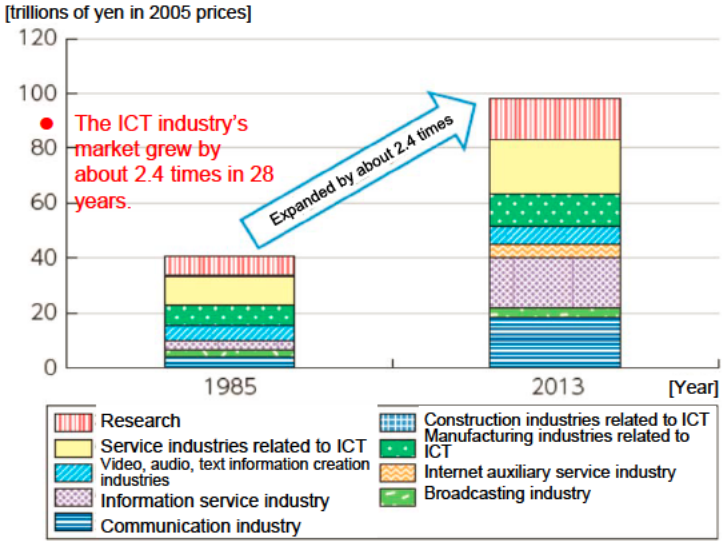
Sales by telecommunications carriers (total sales in the domestic market and international market)



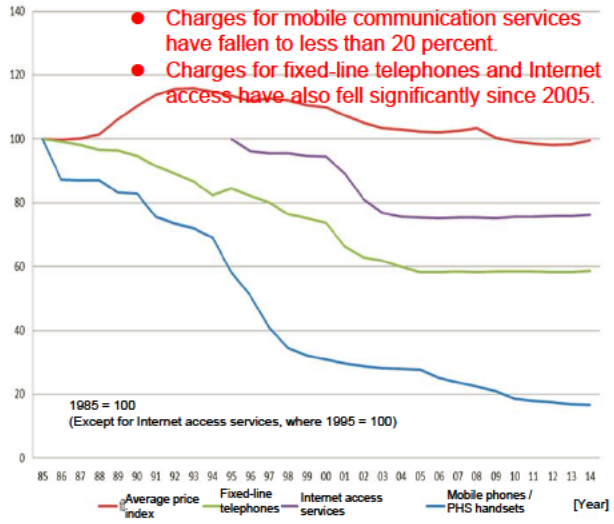
ICT industry's contribution to economic growth



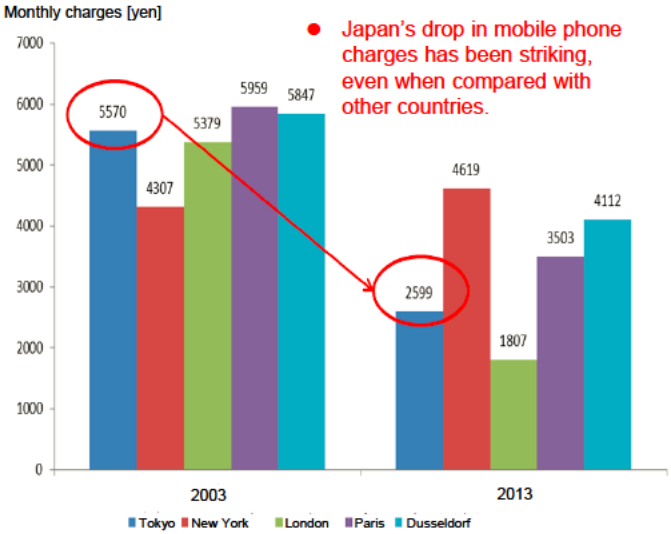
Size of the ICT industry's market



Transitions in communication charges

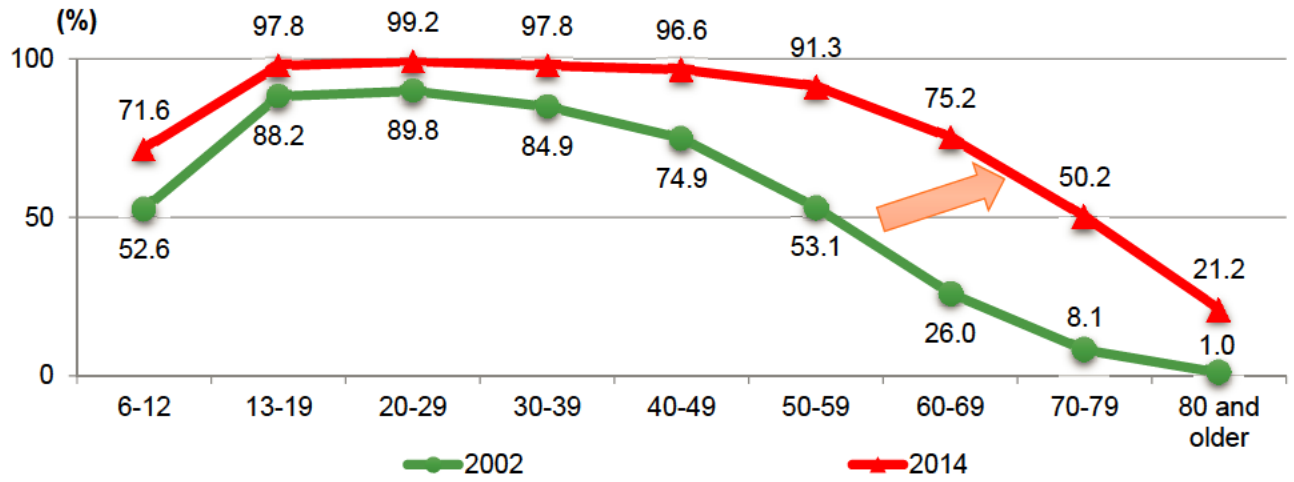


International comparison of mobile phone charges

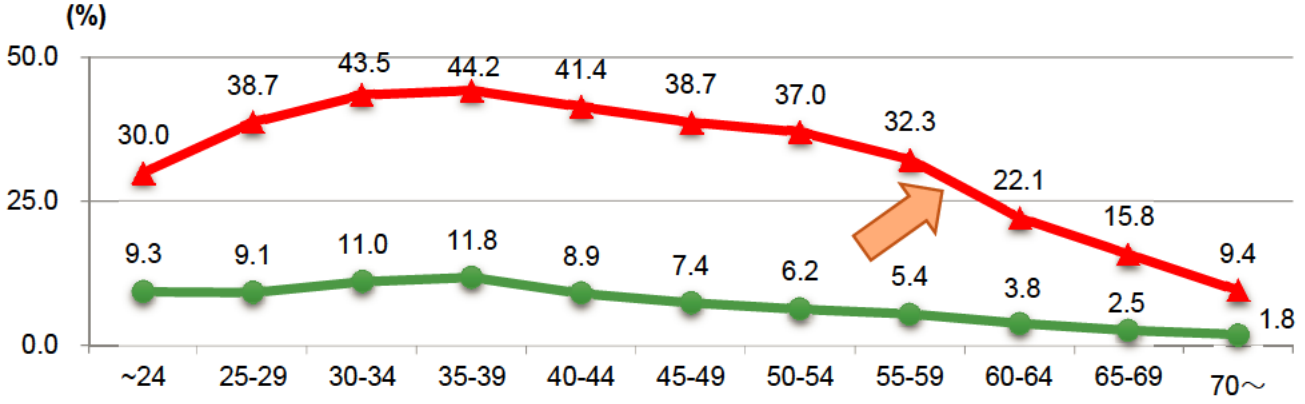


Beginning with Internet usage, ICT applications have proliferated in every age bracket in the past 10 years.

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

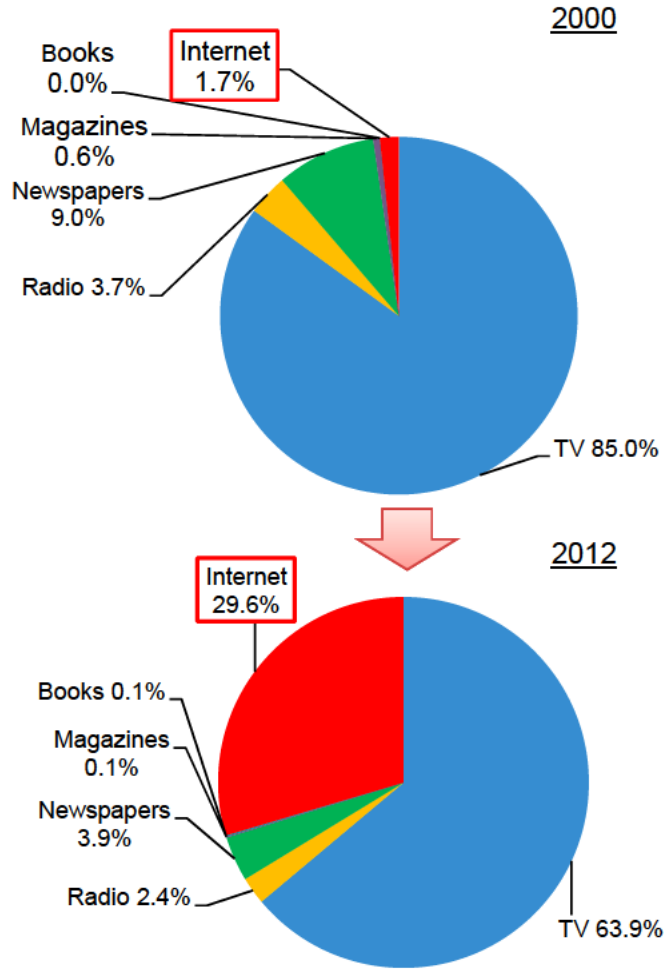


Net shopping rates by age of head of household (households of two or more people, 2002 versus 2014)



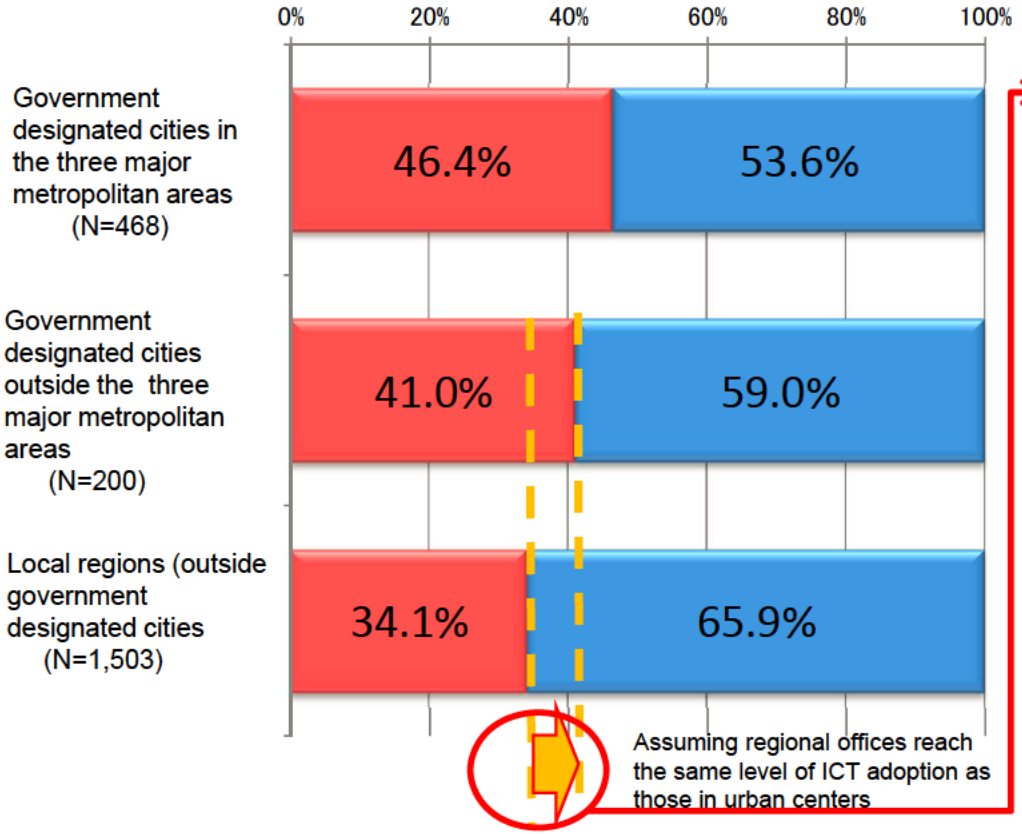
Increase in using the Internet to gather information

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



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

ICT adoption by region



Note: ICT adoption: a score based on the extent of ICT application use in offices (indicators include status of network deployment, status of device provision to employees, and status of cloud application usage).

Employment creation driven by ICT adoption (rough calculation)

Assuming the percentage of groups with high ICT adoption in local regions reaches that in government designated cities outside the three major metropolitan areas

Regional ICT adoption increases

- **Increase in the percentage of offices that are successful in their current business** → **Create jobs for 86,092 people (full-time permanent positions)**
- **Increase in the percentage of offices that create new business** → **Create jobs for 113,420 people (full-time permanent positions)**

Create jobs for about 200,000 people

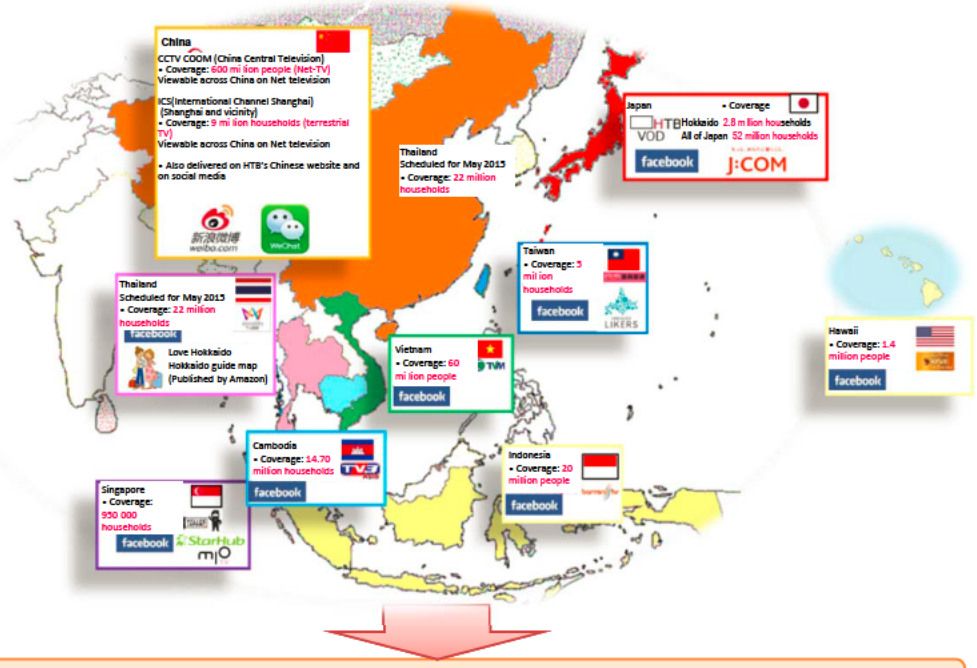
- ICT stimulates the exchange of information and goods across regional boundaries, which helps to increase the nonresident and resident populations

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

An artisan explains his handbags

Hiking on Mount Asahi

Expansion of regions broadcasting "I Love Hokkaido"



Since broadcasts started in 1997, tourists from Taiwan doubled in two years. Ten years later, the numbers had increased by more than five times.
(Source: Survey on the Number of Visitors to Hokkaido, Hokkaido Tourism Bureau)

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

Summary of the Satellite Office Project

- Tokushima prefecture has established FTTH networks (98.8 percent coverage rate) and publicly build, privately operated optical cable TV networks (88.3 percent subscription rate) throughout the prefecture.
- It has also enhanced assistance for opening offices and operating costs (such as communication costs and costs to refurbish old houses).
- The project promotes the establishment of satellite offices in lightly-populated areas and attracts ICT venture businesses to the region.

Satellite offices that remodel old houses and warehouses

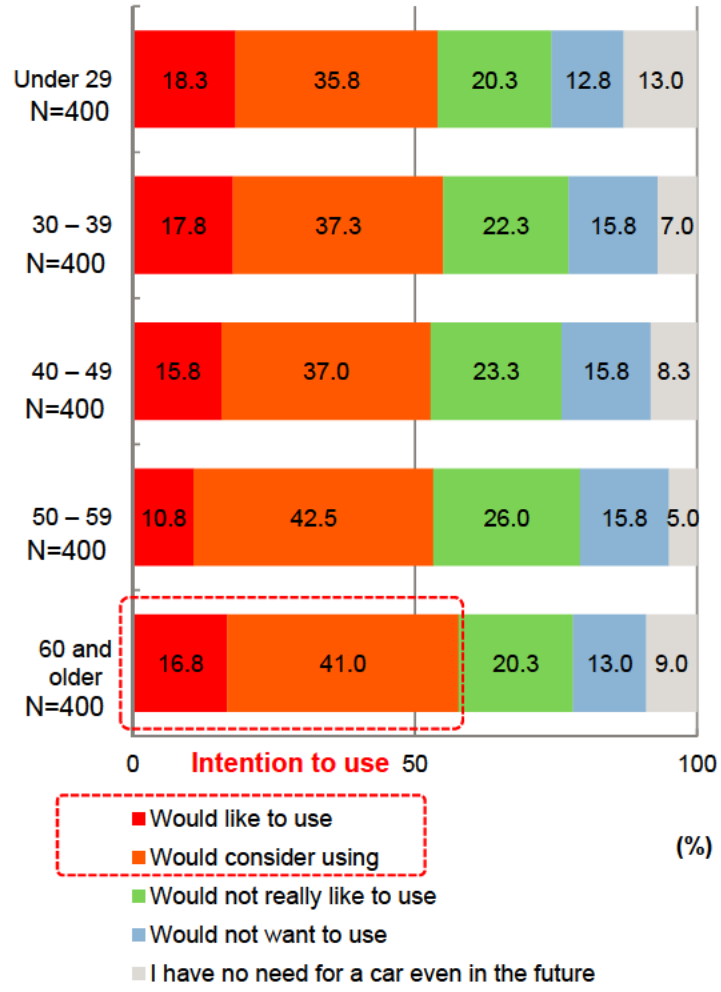
Specifically targets ICT venture businesses in Tokyo Metropolitan area

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).

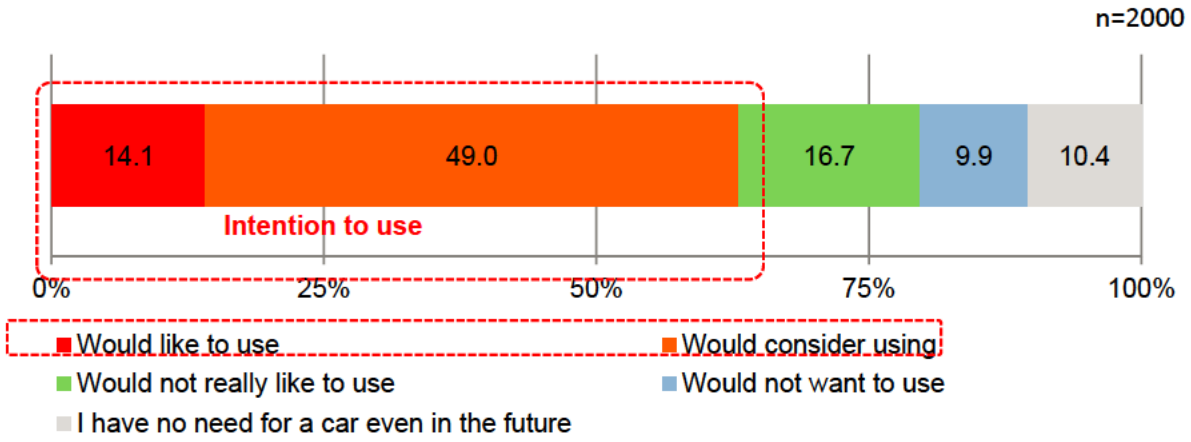
In 2015, the project received an award in the Local computerization category for contributing to the revitalization of local economies.

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

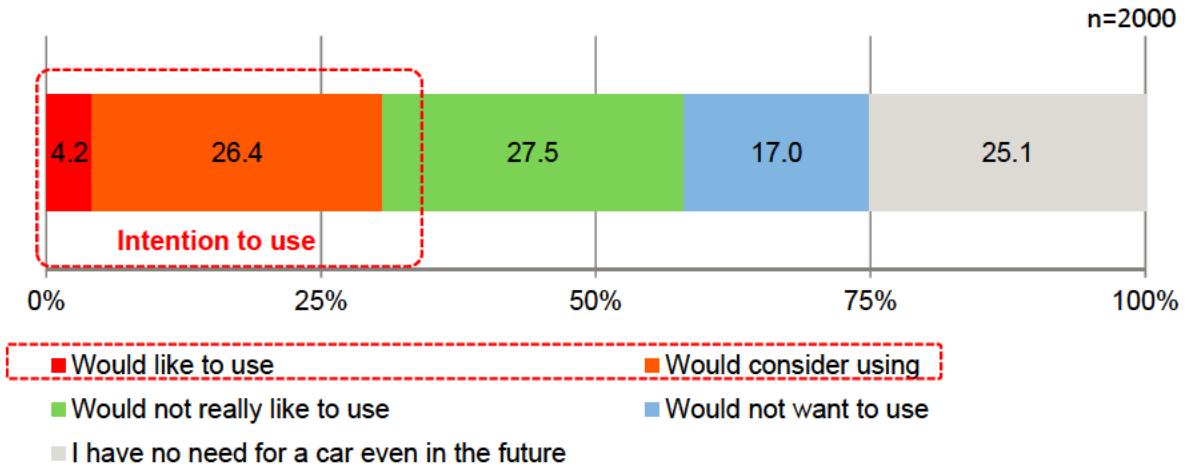
Acceptance of autonomous cars (by age)



Acceptance of caregiving robots



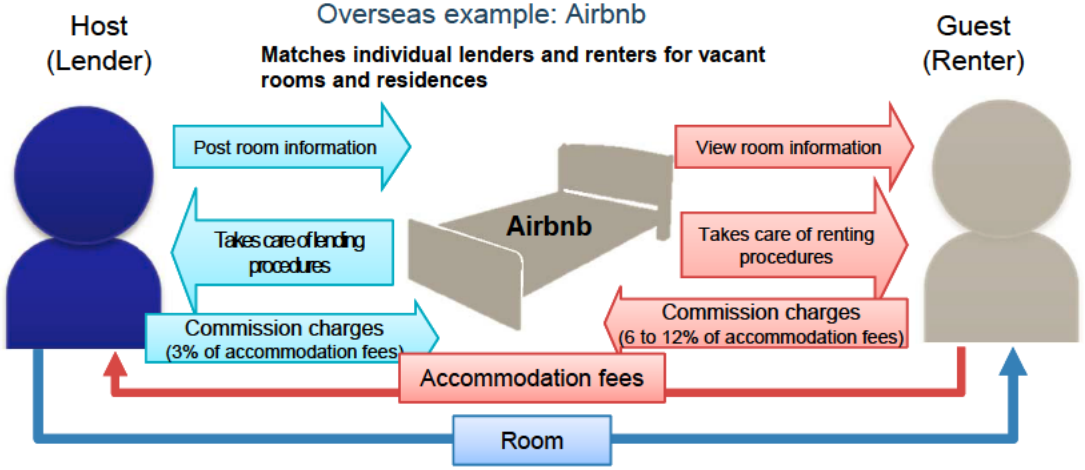
Acceptance of child-raising robots

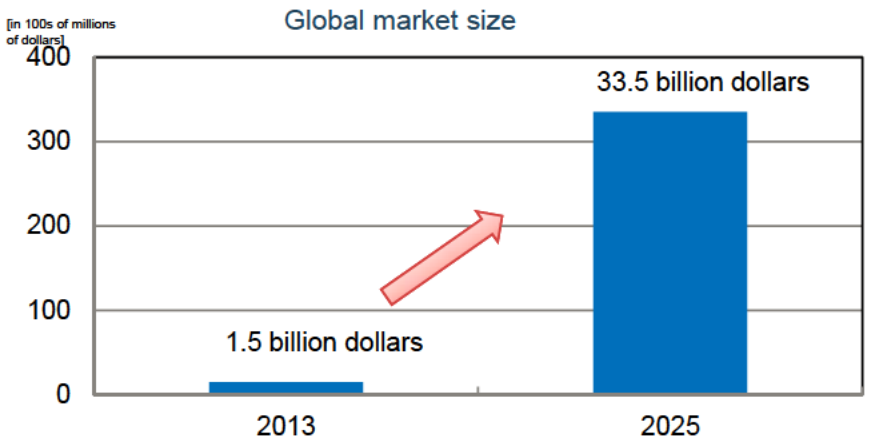


Chapter 4: ICT and Future Lifestyles (2): Transformations Caused by the Growth of Social Media

- The sharing economy is growing, in which individuals use social media to lend and rent vacant rooms and other unused assets.
- When sharing information on social media, there is a trend to judge information on its emotional or entertainment value rather than on its credibility.

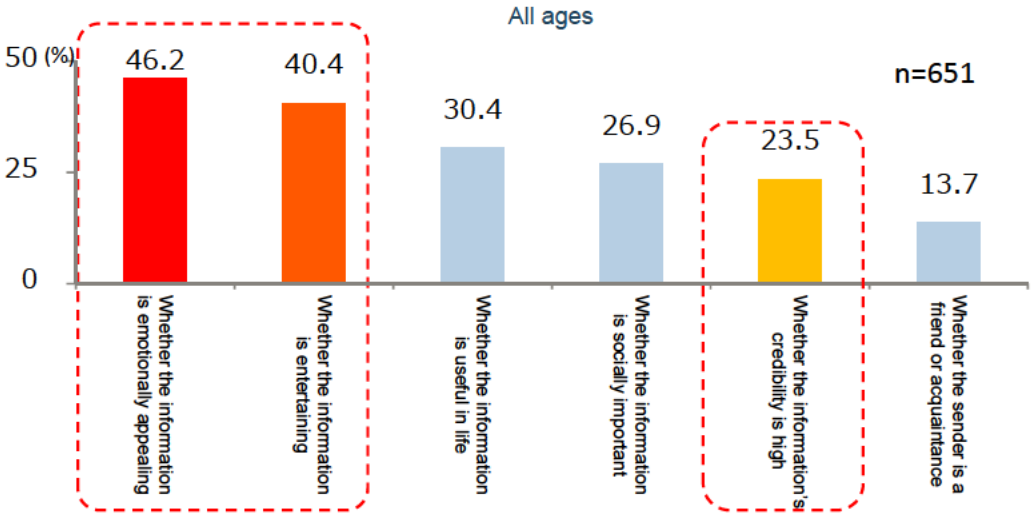
Sharing economy: a new economy making use of social media

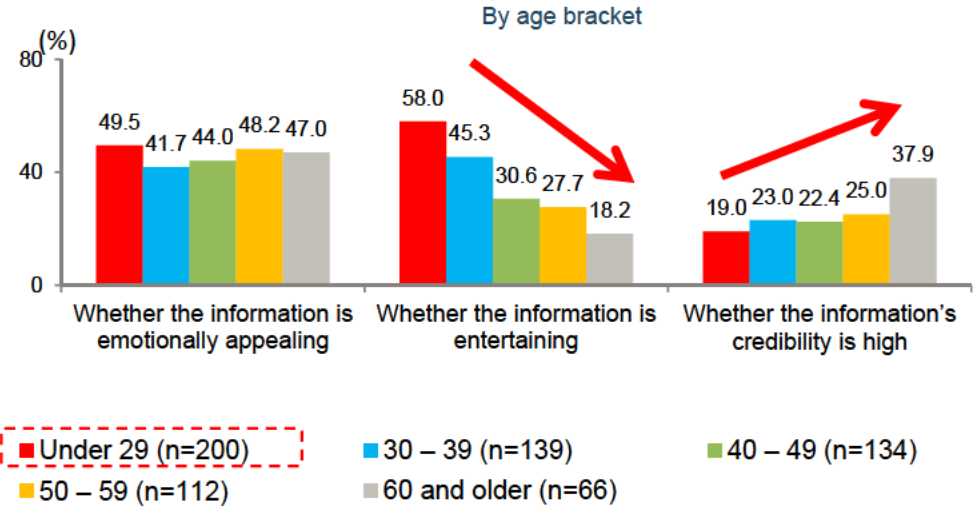




Criteria for sharing information on social media

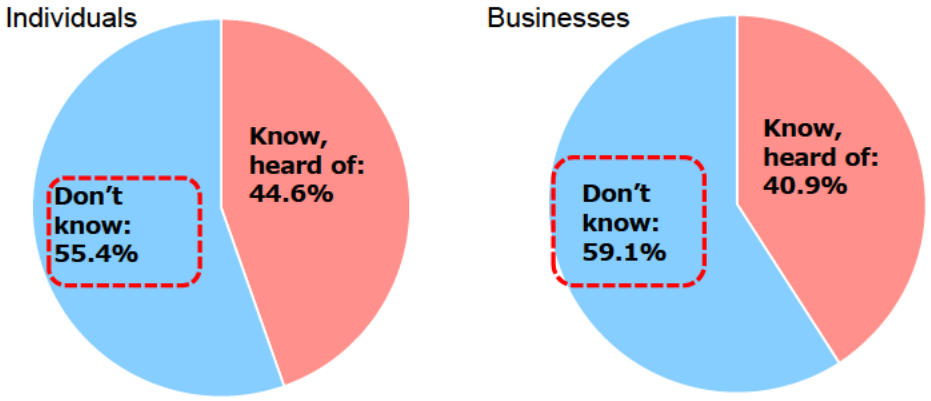
- **Tendency to judge information on its emotional or entertainment value rather than on its credibility. This trend is more pronounced among the younger cohort.**



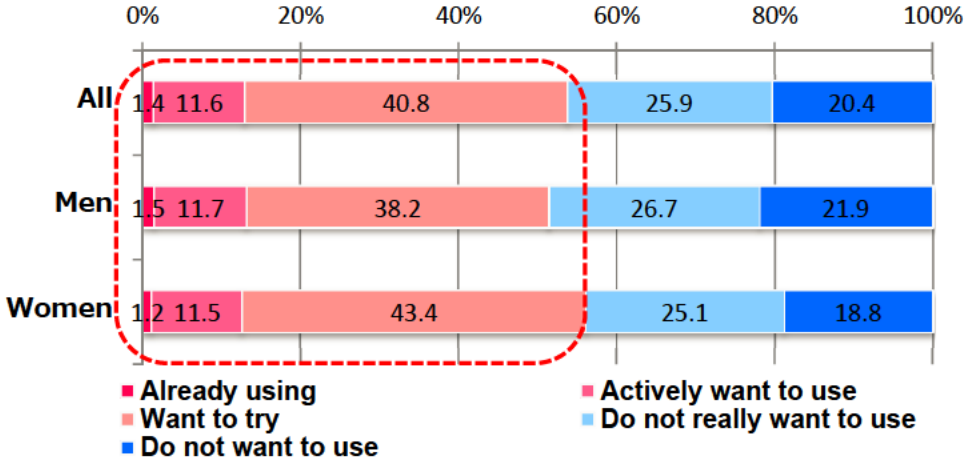


- Recognition of telework is low, but the latent needs are high. Therefore, further publicity is necessary.
- Telework can meet the needs of many people differing in gender, age, location, and circumstances.

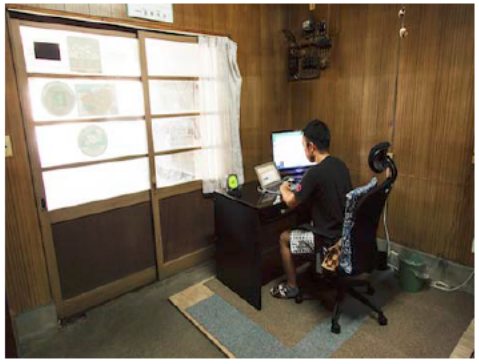
Recognition of telework (individuals, businesses)



Intention to use telework



People who have devised new work styles with ICT Note: Interviews are provided in the White Paper



Hiroshi Ogino, HeartRails Inc.
I wanted to be near my grandfather who lives alone, so I changed jobs to a company where I could work from home and moved back to Ehime Prefecture.

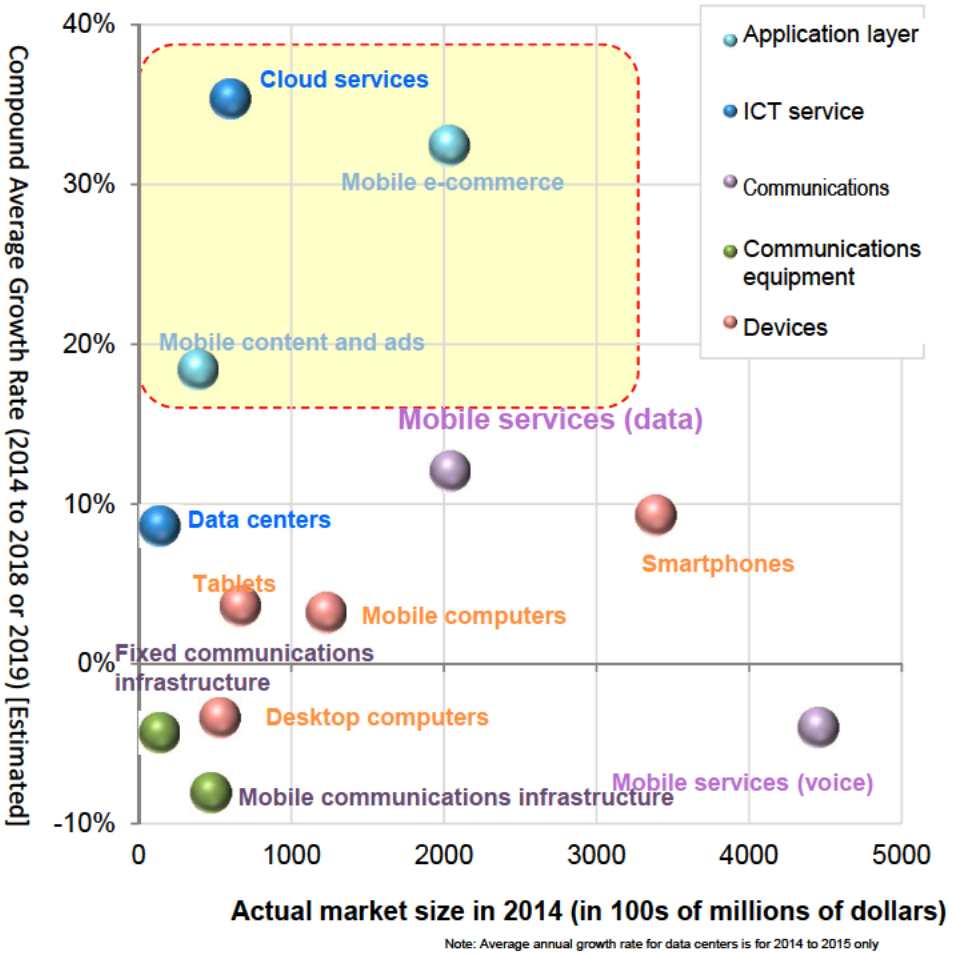
Rui Tanaka, Caster, Inc.
After encountering the difficulties women have finding jobs in local regions, I became an at-home worker.

Toyoshi Ishigura, Crowdworks
I was frustrated in finding a new job after compulsory retirement, so I registered with this crowdsourcing service as a new means of working.

Masami Ohtsuki, Polaris nonprofit
I coordinate the tasks of a homemaker team who work from their homes at a share office that is part office, part membership system.

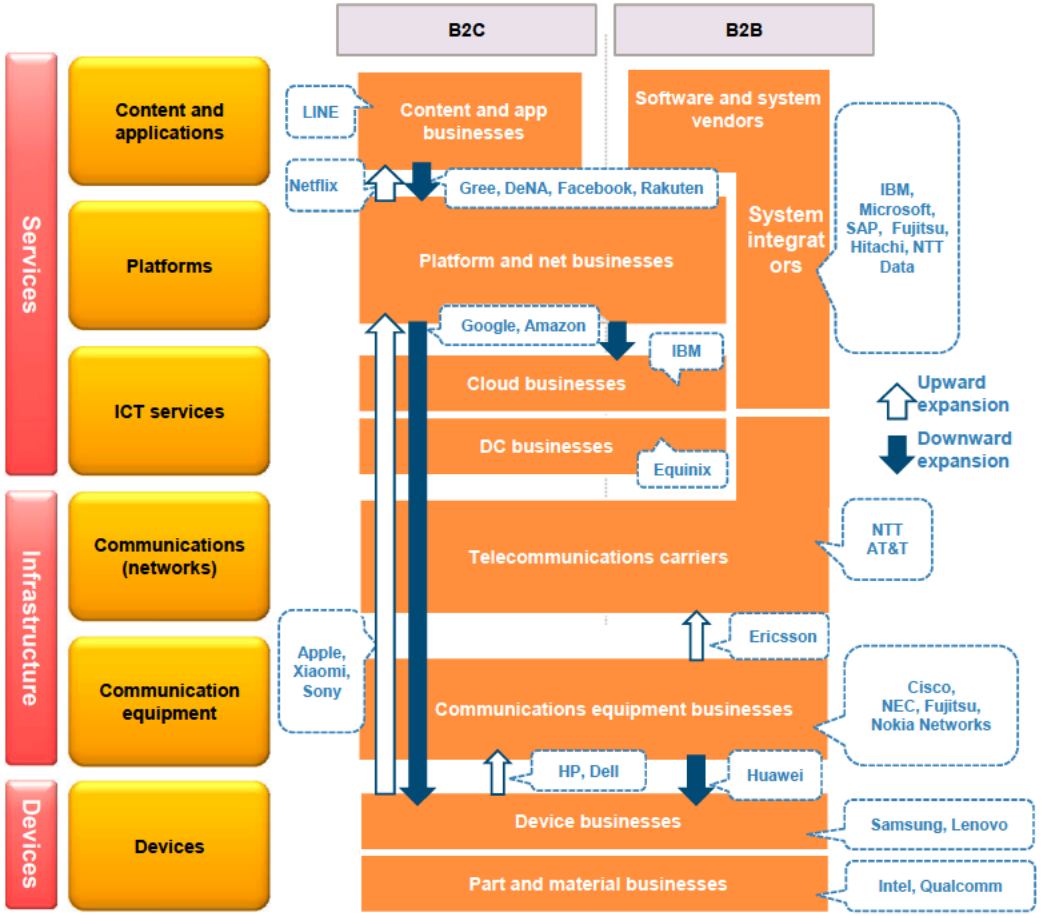
- The global ICT industry continues to grow, particularly in mobile and cloud.
- The structure of the ICT industry had shifted from vertical integration to in-layer horizontal integration, but more recently, corporations have actively expanded into higher and lower layers and formed collaborations across layers.

Scale and growth potential of main markets in each layer



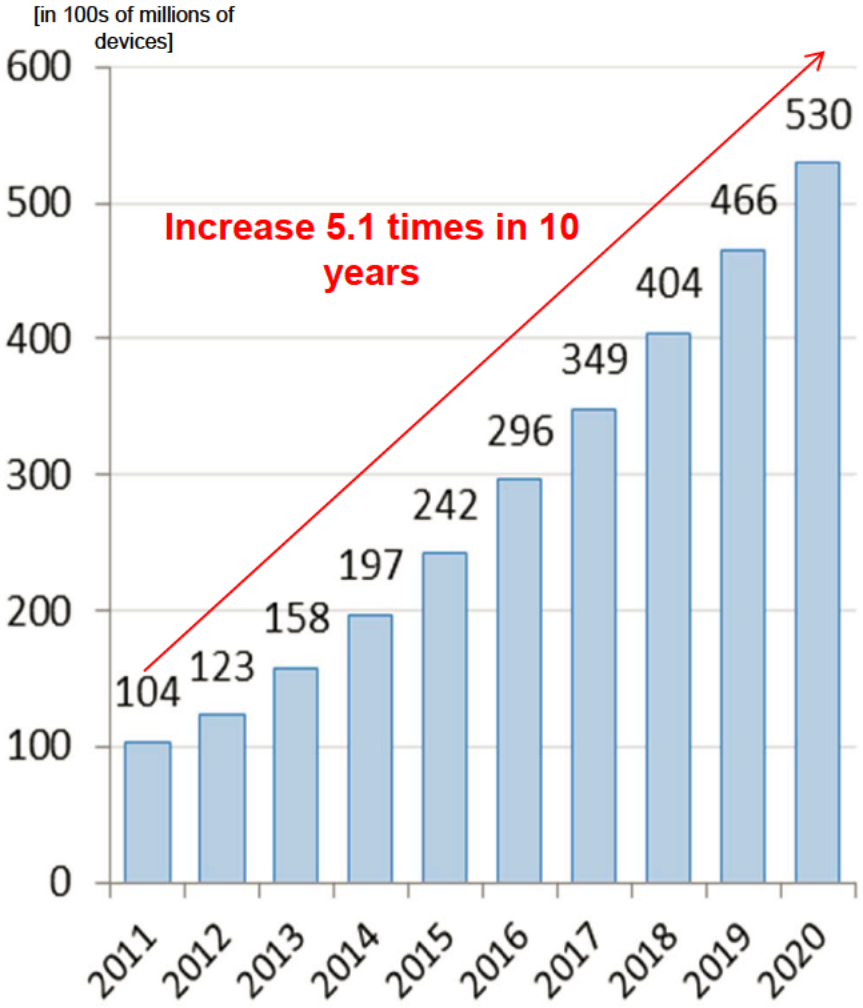
Note: Average annual growth rate for data centers is for 2014 to 2015 only

Activation of expansion and collaborations between layers

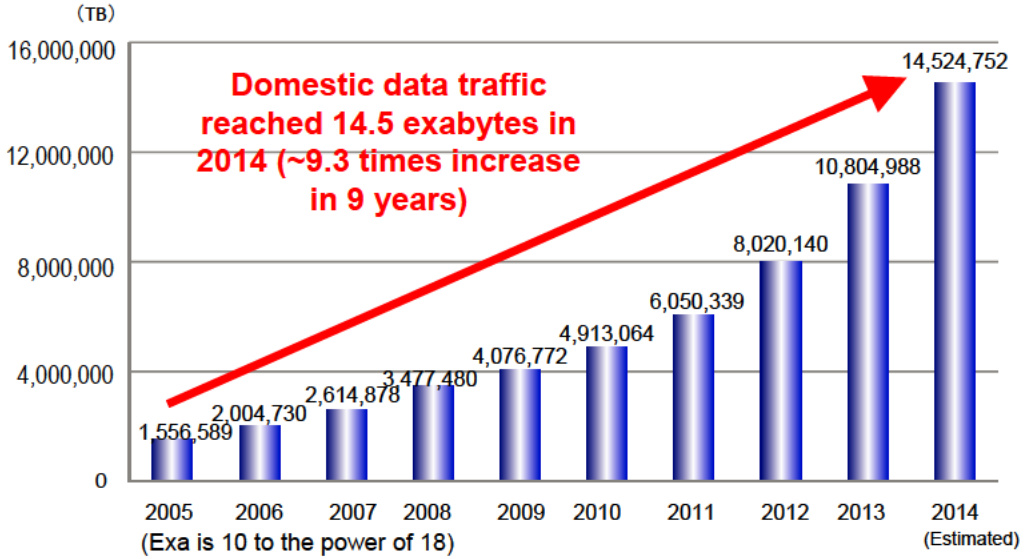


- The Internet of Things (IoT) is expected to explode in the near future. Domestic data distribution volumes are estimated to expand to 9.3 times in the nine years up to 2014.
- There are active movements to collect and analyze all kinds of data via the IoT and use the data to make business processes more efficient.

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



Transitions in domestic data distribution volumes



Pioneering IoT initiatives in industry

Komatsu

Determine operational status, predict demand

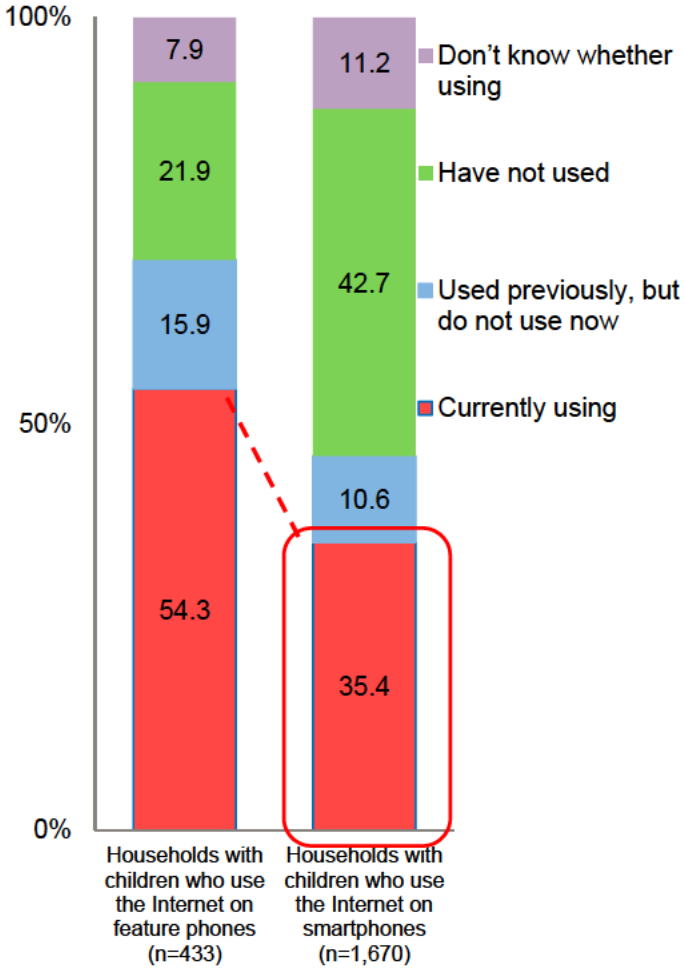
Komatsu has installed communications modules on all its construction equipment sold around the world, which enable the company to determine their position and operational status in real time. Komatsu provides information useful for equipment maintenance and management to user companies as well as analyzes data gathered around the world at its center to make highly accurate demand predictions.

Issues with Proper Internet Use (provided in Chapter 4 and Chapter 7)

- Filtering functions are used far less when children use the Internet on smartphones than when children use the Internet on feature phones.
- The younger cohort uses the Internet longer than other cohorts, and they are more likely to have experienced problems on social media.

Usage of filtering software and services

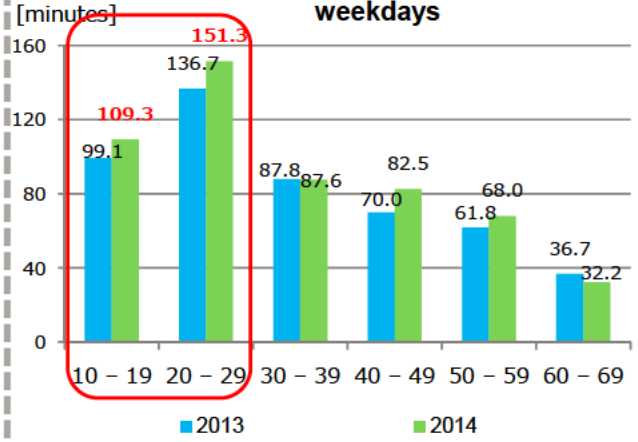
Among households with children under 18 who use the Internet



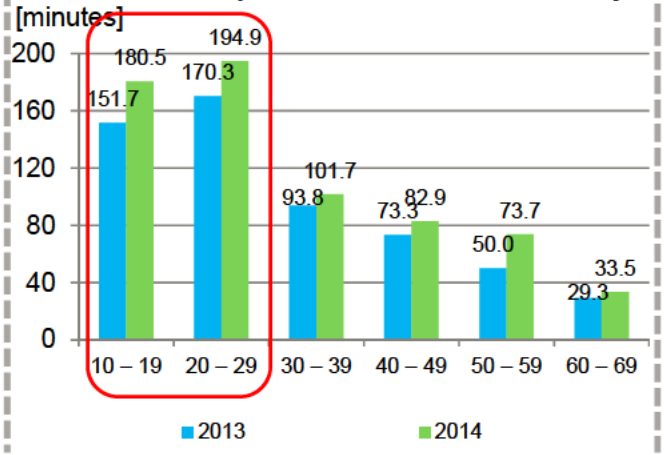
Time spent on the Internet

Teens and twenties use the Internet an average of 100 minutes or more on weekdays and 180 minutes or more on holidays

Time spent on the Internet on weekdays

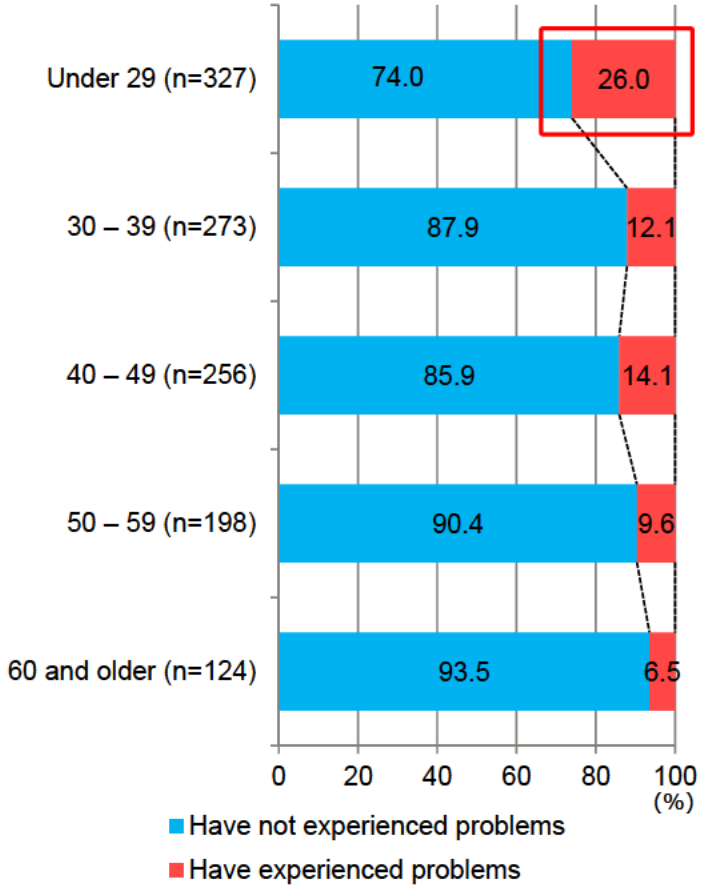


Time spent on the Internet on holidays



Experienced problems* on social media

* **Problems include quarreling with other people on social media or having personal information disclosed on social media**



Initiatives to Promote Proper Internet Use (provided in Chapter 8)

- MIC engages in various awareness raising activities to promote the use of filtering, to support creating Internet usage rules in homes, and to raise ICT literacy among young people.

Efforts to raise awareness about the safe use of smartphones by young people

- MIC's regional bureaus of telecommunications lead the creation of awareness raising materials that include information on filtering, smartphone characteristics and service structures, and privacy as well as information on security measures. MIC works with a broad range of stakeholders active in local regions, including local governments, the police, PTAs, school officials, mobile phone operators, mobile phone distributors, social media operators, consumer organizations, and NPOs.
- The materials are used to develop comprehensive awareness raising activities to raise ICT literacy aimed at young people, guardians, and educators.

Awareness raising in shopping areas

Awareness raising at school entrance information sessions

Awareness raising at Matsuda Stadium

Posters for "Safe Internet for Youth — Action Plan for the New School Term"

Efforts to raise ICT literacy among young people

- MIC, in coordination with MEXT and ICT-related organizations, runs the e-Net Caravan, a nationwide traveling series of classes for guardians, educators, and young students on safe and secure use of the Internet by children.
- The classes were held in 2,789 places nationwide (elementary, middle, and high schools etc.) in 2014. Around 510,000 students, guardians, and educators attended the classes.

Scene from a class

Course for e-Net Caravan lecturers

- MIC promotes Expanding ICT Media Literacy — Connect! Learn! Communicate! The Internet, a program for nurturing wide-ranging ICT literacy. Materials are developed for schools and families.

Text books for schools

Teacher's Guide (for instructors)

Textbook (for students)

Text books for families

Family Study Guidebook (for guardians)

Workbook (for children)

Reference: Policy Trends Related to the Special Theme (Chapters 1 to 6)

- At the end of each section is a page entitled “Policy Focus” that presents the latest MIC policies that are closely connected to the special theme.

Part 1: Looking Back at ICT’s Progress

Chapter 1: Telecommunications Liberalization and Growth of the ICT Industry

Section 1: 30 Years Since Communication Liberalization: System, Service, and Market Transitions	**Policy Focus: Amendments to the Telecommunications Business Act**

Part 2: Future Society Spearheaded by ICT

Chapter 3: ICT and the Future of Regions

Section 1: ICT and Regional Enterprises	**Policy Focus: Study Group on Promoting Regional ICT Investments Utilizing Cloud and Other Technologies**
Section 2: ICT and Regional Employment	**Policy Focus: Advancement of Home Town Telework**
Section 3: ICT and Regional Issues	**Policy Focus: (1) Local Computerization Award, (2) ICT use and application in town development**

Chapter 4: ICT and Future Lifestyles

Section 4: ICT and the Olympic and Paralympic Games	**Policy Focus: Panel on Promoting ICT Adoption by All Aspects of Society Toward 2020**

Chapter 5: ICT and the Future of Industry

Section 2: Global Trends in the ICT Industry	**Policy Focus: (1) Incorporated Organization to Aid Overseas Communications, Broadcasting, and Postal Services, (2) Expansion of packaged ICT infrastructure overseas**
Section 4: Transformations in Economic Structures Caused by ICT Development	**Policy Focus: (1) Hosting the Global ICT Summit 2015, (2) Study Group on Fundamentals for the Fab Society**

Chapter 6: Overcoming Population Decline and Revitalizing Local Economies in the Future by ICT

Section 1: Further Evolution of ICT	**Policy Focus: Study Group on a Future Vision of Increasingly Intelligent ICT**