

# Part I

## Special Theme: Realization of Sustainable Growth through Utilization of ICT

### Chapter 1

#### Revitalizing Local Communities and Regenerating “Ties” via ICT

In this part of the report, we will quantitatively and qualitatively examine the revitalization of local communities through the promotion of ICT (Information and Communications Technology) utilization in said communities, along with the role of ICT in strengthening social ties in these communities and improving quality of life in local communities by facilitating the social participation of all members of society.

#### Section 1

##### Local Community Revitalization via the Thorough Application of ICT

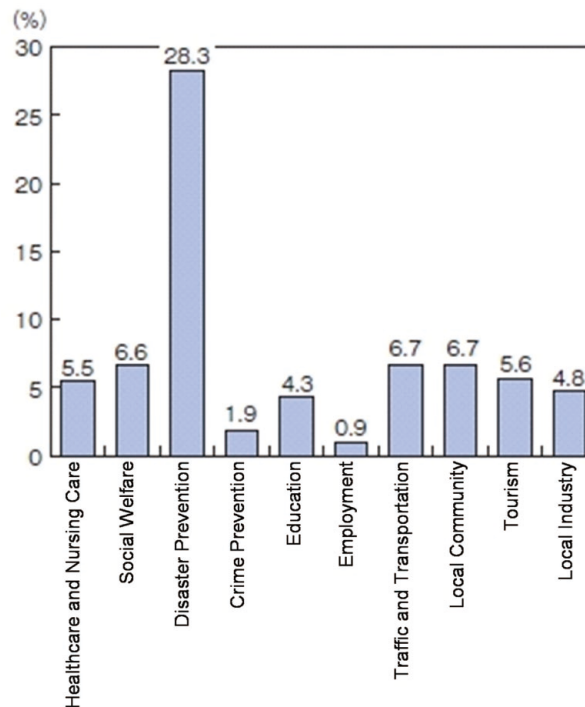
We will evaluate the economic value of benefits to citizens brought by extensive utilization of ICT in public service sectors integral to life in local communities, such as “health and medicine,” “education and labor,” and “lifestyle and living.” In addition, we will analyze examples of use of ICT to revitalize local communities, and estimate the economic values that can be obtained if broadband service penetrates to 100% of households.

##### 1. Estimation of benefits to citizens from ICT utilization in the public service sector

###### (1) Status of ICT utilization in local communities

Figure 1-1 shows the results of a survey on implementation by local governments of typical programs employing advanced ICT systems in 10 sectors: medicine, social welfare, education, disaster prevention, crime prevention, traffic and transportation, labor, local communities, tourism, and local industry. The survey showed that 28.3% of communities had implemented such projects in the disaster prevention sector, while the other sectors had implementation rates below 10%.

Figure 1-1 Status of ICT utilization by local governments throughout Japan (overall)



(Source) Ministry of Internal Affairs and Communications “Research into Regional ICT utilization” (2010)

###### (2) Desire of utilization of ICT services that reflect the public viewpoint

The Ministry of Internal Affairs and Communications has identified three sectors integral to life in local communities, “health and medicine,” “education and labor,” and “lifestyle and living,” and independently come up with three potential ICT services for each sector, as shown in Figure 1-2.

**Figure 1-2 ICT services related to health and medicine, education and labor, and lifestyle and living**

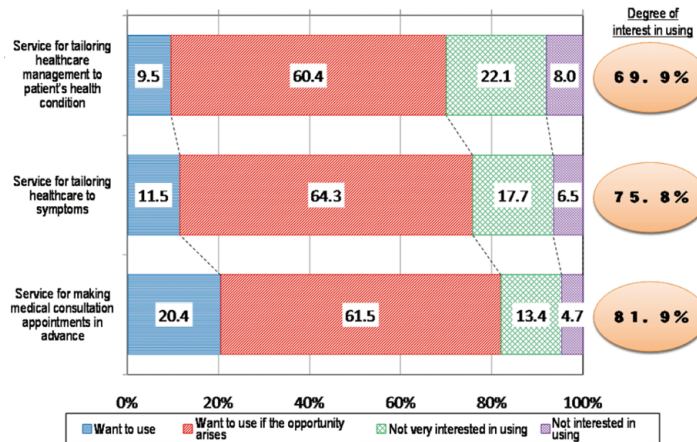
Sector	Service	Contents of Service
Health and medicine	Health management services tailored to individuals' physical condition	<ul style="list-style-type: none"> <li>• A web site allowing users to manage their own health information including personal data (height and weight, etc.) and medical history and their average amount of daily exercise, etc.</li> <li>• Users can obtain advice tailored to their physical condition and information on examinations being conducted in nearby municipalities, helping them to prevent the outbreak or worsening of illnesses</li> </ul>
	Service for tailoring healthcare to symptoms	<ul style="list-style-type: none"> <li>• A web site allowing users to register their own medical information (from their medical file, etc.), personal data and health information (height, weight, medical history) etc.</li> <li>• The registered information can be disclosed to medical institutions, and users can undergo examinations ideally suited to their symptoms, as well as avoiding redundant examinations, and obtaining examination results at a nearby clinic which they can then take to a general hospital for further treatment</li> </ul>
	Service for making medical consultation appointments in advance	<ul style="list-style-type: none"> <li>• Based on specific conditions such as their area of residence, symptoms and physical condition, users can search nationwide for the hospital or clinic most appropriate to their needs</li> <li>• For the hospital or clinic they have found, users can confirm the examination hours, the location and means of access, as well as the availability of appointments, and can make reservations when appointments are available</li> </ul>
Education and labor	Learning and teaching exchange service suited to the individual	<ul style="list-style-type: none"> <li>• Users of the service will be able to conduct classes using textbooks and teaching materials in digital form (including teaching with audio and video materials)</li> <li>• The service can be used for individually tailored instruction or as a forum for students to teach and learn from one another</li> </ul>
	Online education portal services	<ul style="list-style-type: none"> <li>• Users can view information, primarily from Japanese universities, graduate schools and vocational schools, on available online courses and lectures and events open to the general public</li> <li>• In addition to searching for the most appropriate information from among available courses and lectures, including desired subjects, teaching methods, and duration and schedule of courses, users can apply for and even attend courses online, obtaining credits and degrees accordingly</li> </ul>
	Job-hunting support service tailored to each job seeker's education and qualifications	<ul style="list-style-type: none"> <li>• A web site allowing users to register information such as their own academic history and qualifications obtained, work history, objectives and preferred occupation and career plan</li> <li>• Based on the information they have registered, users can receive employment advice, or disclose the registered information to a job-placement office or directly to corporations, making consultations more efficient and enhanced and matching job hunters with head-hunting corporations</li> <li>• Users can search for information on the necessary academic background and qualifications for a career in their desired field, and in some cases can make use of academic services and take tests to obtain qualifications online</li> </ul>
Lifestyle and living	One-stop service for completing all necessary procedures involved in moving home	<ul style="list-style-type: none"> <li>• When moving, users can submit necessary documents and information to various institutions all at one time</li> <li>• Documents submitted can be shared among institutions (particularly administrative bodies such as local governments), so that users can avoid submitting the same document multiple times</li> </ul>
	Support service to help with the creation, etc., of tax returns	<ul style="list-style-type: none"> <li>• Regarding medical and other expenditures eligible for deduction, the receipts acting as evidence of expenditure are put in electronic form and can be saved on the web site (My Page) of this service</li> <li>• The service can be coordinated with household accounts, etc. and tax returns can be filed using the saved electronic receipts</li> </ul>
	Large item/unwanted item recycling services	<ul style="list-style-type: none"> <li>• When planning to dispose of unwanted furniture, appliances and so on, users can view the disposal fees and terms and conditions of municipal governments, recycling businesses, appliance manufacturers, etc.</li> <li>• When having the municipal government pick up the items as bulky garbage, the site can be used to make reservations and pay fees online</li> <li>• When users post information about unwanted items online using this service, others can view the items and if they find things they want, the items can be transferred from user to user</li> </ul>

(Source) Ministry of Internal Affairs and Communications "Research on Community Revitalization and International Competitiveness through the Application of ICT" (2010)

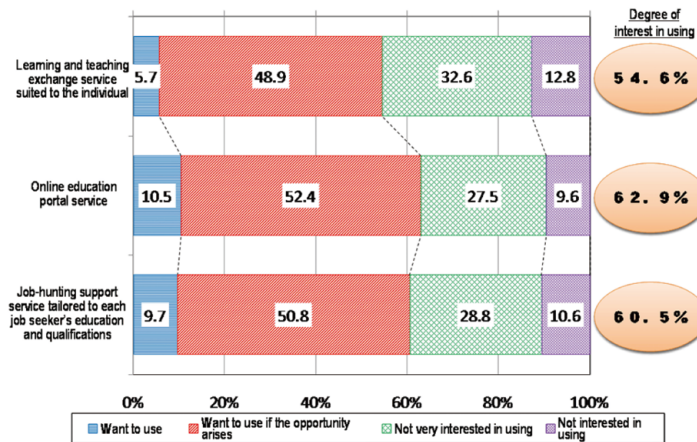
Figure 1-3 shows the results of an online survey given to Internet users regarding interest in utilizing the nine ICT services outlined above. It can be seen that for the majority of the services, approximately 60% or more of Japanese citizens expressed an interest in utilizing them.

**Figure 1-3 Interest in utilizing services in the fields of “health and medicine,” “education and labor,” and “lifestyle and living”**

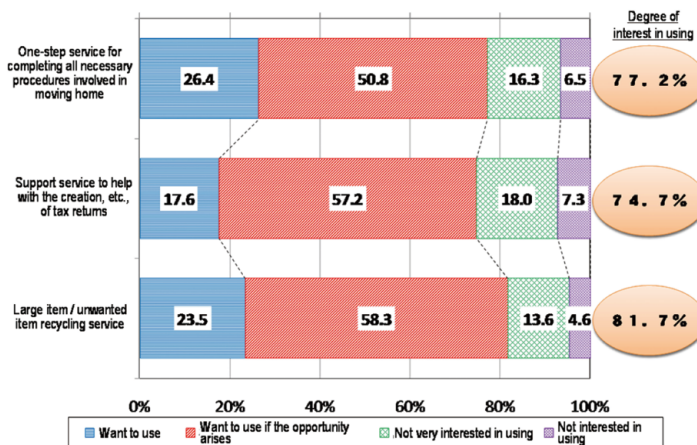
[Health and Medicine]



[Education and Labor]



[Lifestyle and Living]



\* Each graph shows the interest in utilizing the services in question among 15-64 year old respondents, adjusted for population (Source) Ministry of Internal Affairs and Communications “Research on Community Revitalization and International Competitiveness through the Application of ICT” (2010)

**(3) Public benefit of ICT services that reflect the public viewpoint**

Figure 1-4 shows the results of evaluations and estimates of economic value (potential value) to users and providers from the implementation of such ICT services as we have described, according to an independently established logic model. According to these estimates, the combined economic value to users of the three ICT services in the “health and medicine” sector totals approximately 1.49 trillion (1,490 billion) yen, that of the “education and labor” sector approximately 619 billion yen, and that of the “lifestyle and living” sector approximately 45 billion yen.

**Figure 1-4 Economic value to users from the utilization of ICT in the public service sector (estimated)**

Potential benefits		Economic value for users	Total for all three services	Economic value to providers
Healthcare and medicine service	Service for tailoring health-care management to patient's health condition	Medium estimate (25% of effects) 577.7 billion yen	Economic value for users 1490.0 billion yen	Medium estimate (25% of effects) 1347.9 billion yen
	Service for tailoring healthcare to symptoms	Medium estimate (25% of effects) 244.3 billion yen		Medium estimate (25% of effects) 536.0 billion yen
	Service for making medical consultation appointments in advance	Medium estimate (25% of effects) 668.2 billion yen		For providers, the goals are more efficient medical treatment and lessening of the medical workload, to which it is difficult to assign a quantitative value. For this reason, economic effect is not estimated.
Education and employment service	Learning and teaching exchange service suited to the individual	Medium estimate (25% of effects) 80.2 billion yen	Economic value for users 619.0 billion yen	For providers, the goals are improved academic performance for students and a better work environment for teachers, to which it is difficult to assign a quantitative value. For this reason, economic effect is not estimated.
	Online education portal service	Medium estimate (25% of effects) 238.3 billion yen		For providers, the goals are to provide an open learning environment and opportunities, to which it is difficult to assign a quantitative value. For this reason, economic effect is not estimated.
	Job-hunting support service tailored to each job seeker's education and qualifications	Medium estimate (25% of effects) 300.9 billion yen		Medium estimate (25% of effects) 40.9 billion yen
Life and Lifestyle Service	One-stop service for completing all necessary procedures involved in moving home	Medium estimate (25% of effects) 6.0 billion yen	Economic value for users 45.0 billion yen	Medium estimate (25% of effects) 3.8 billion yen
	Support service to help with the creation, etc., of tax returns	Medium estimate (25% of effects) 39.1 billion yen		Medium estimate (25% of effects) 24.7 billion yen
	Large item / unwanted item recycling service	Medium estimate (25% of effects) 400 million yen		Medium estimate (25% of effects) 2.3 million yen

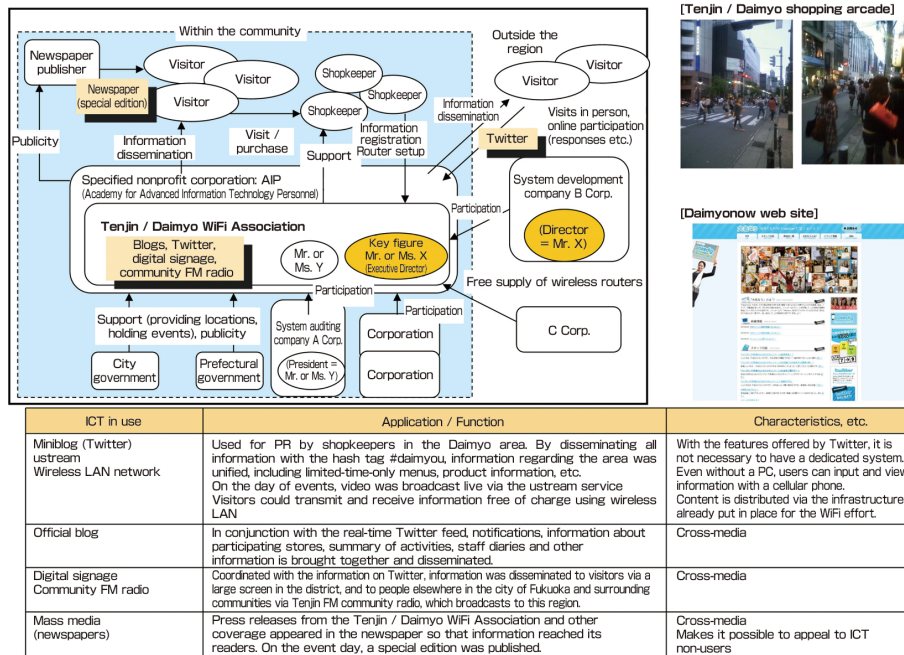
(Source) Ministry of Internal Affairs and Communications “Research on Community Revitalization and International Competitiveness through the Application of ICT” (2010)

**2. Leading-edge examples of community revitalization via ICT**

“Daimyonow” (based in Fukuoka) is a project employing ICT such as micro-blogging service Twitter, digital signage, and FM radio to disseminate real-time information about the Daimyo shopping district in central Fukuoka, and thereby encourage more shoppers to visit and give a boost to local tourism (Figure 1-5). Its goal is to provide a digital environment allowing participating shopkeepers to disseminate information easily, for example by entering it into their cellular phones, letting them publicize limited-time-only menus, seasonal product information and so on as an extension of their everyday business activities.

“Daimyonow” is a joint industrial, academic and governmental project administered by the Tenjin / Daimyo WiFi Association, established under the auspices of an NPO aiming to cultivate local ICT personnel. The office of the association plays the role of coordinator, encouraging shopkeepers to participate and disseminating information internally and externally. The project draws strength from an effective distribution of duties, with a “Mr. X” living outside the area providing objective evaluations and advice from an external viewpoint, while local corporate employee “Ms. Y” and other members foster relationships with shopkeepers and so on.

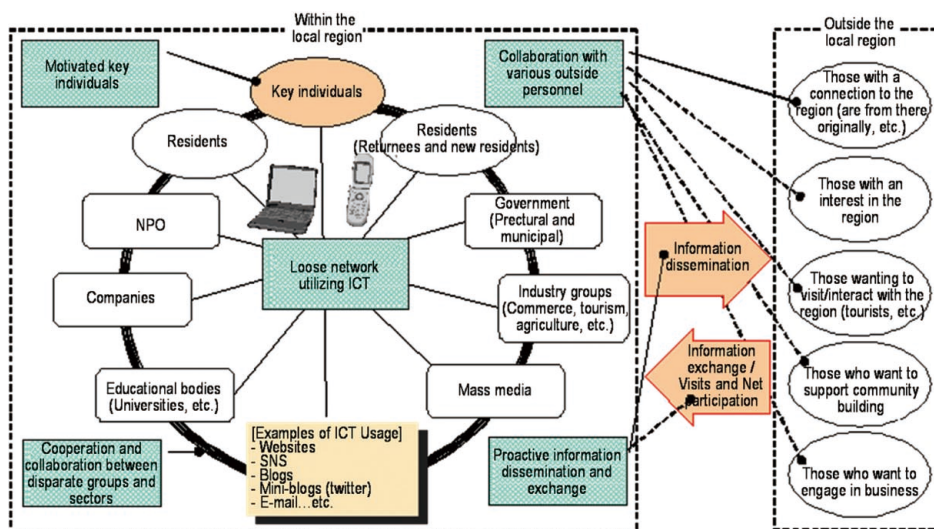
Figure 1-5 Shopping district information is disseminated via micro-blogging in the Daimyonow project



(Source) Ministry of Internal Affairs and Communications “Survey of Leading-edge Examples of ICT Utilization in Japan” (2010)

In best practice examples of local community revitalization, we see motivated key figures acting as a driving force; collaboration and cooperation between disparate groups and sectors, including residents, corporations, NPOs, local governments, local media, and so on; coordination with various outside personnel; and proactive information dissemination and exchange inside and outside the area in question. All of these are made possible with the help of ICT (Figure 1-6). Henceforth, the establishment throughout Japan of mechanisms for advancing such efforts, in which ICT is used to turn rich local resources into a means of local community revitalization, will become increasingly essential.

Figure 1-6 Five key elements in the revitalization of local communities using ICT



(Source) Ministry of Internal Affairs and Communications “Survey of Leading-edge Examples of ICT Utilization in Japan” (2010)

### 3. Public benefit of broadband service penetration

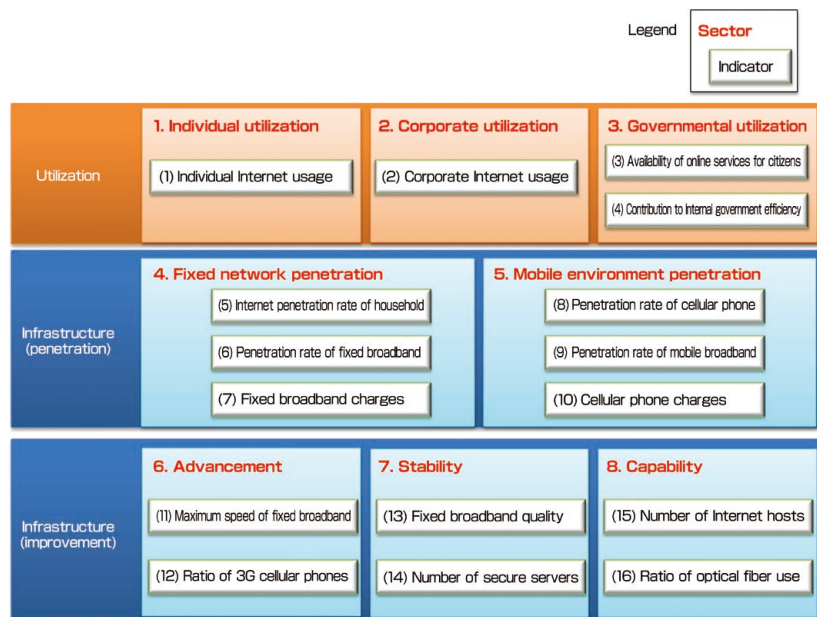
We will now examine the current status of Japan’s ICT infrastructure from various perspectives, making use of international data, and estimate the potential economic values to consumers of ensuring that 100% of households have broadband access and an environment conducive to convenient and comfortable application thereof.

#### (1) International comparison of Japan's ICT infrastructure and utilization

##### A. Evaluation method

For a comprehensive and balanced picture taking into account the progress of ICT, penetration rates in other countries and levels of development, 16 indicators in eight areas (figure 1-7) were selected, and Japan’s ICT infrastructure and rate of utilization was compared with that of 25 countries<sup>1</sup>. In order to eliminate arbitrariness and ensure neutrality, for each indicator, existing data from international organizations, etc. is used in its existing form as a basic rule, the deviation value among 25 countries extracted and comparisons made.

**Figure 1-7 Makeup of indicators used to evaluate Japan’s ICT infrastructure (improvement, penetration) and rate of utilization**



(Source) Ministry of Internal Affairs and Communications "International Comparative Survey on ICT Infrastructure" (2010)

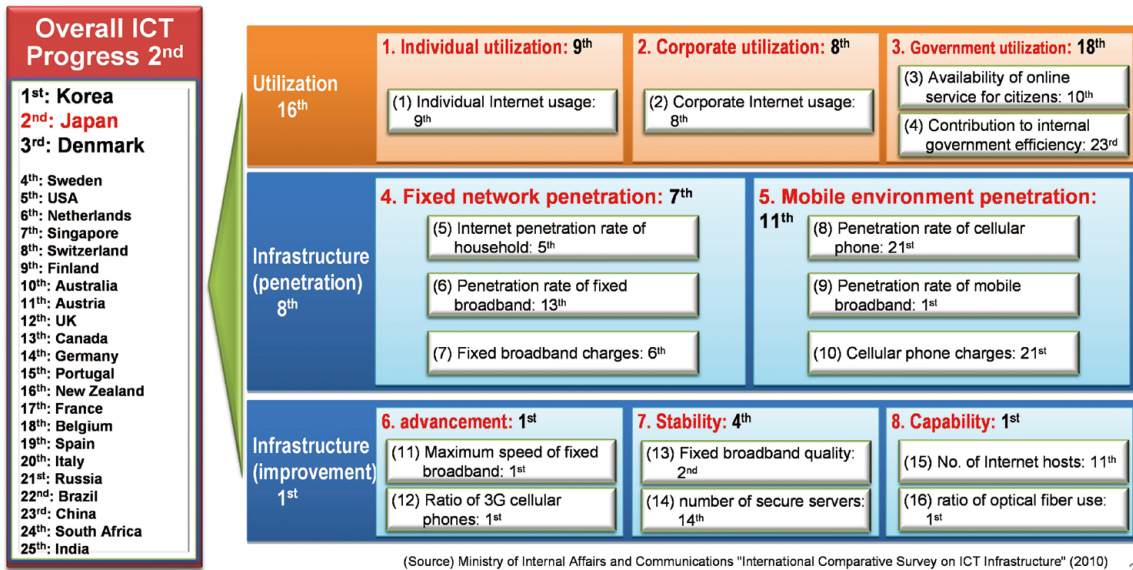
##### B. Overall evaluation and evaluation by area

The results of comparison are shown in Figure 1-8. In terms of the overall ranking (overall ICT progress) encompassing ICT infrastructure (improvement, penetration) and rate of utilization, Japan was ranked second among 25 countries, with South Korea coming in first. As Japan was ranked first in two areas under the “Infrastructure (improvement)” category, “6. Advancement” and “8. Capability,” it is safe to say that Japan is first in this category overall. In terms of “Infrastructure (penetration),” Japan is seventh for area “4. Fixed network penetration” and 11<sup>th</sup> for indicator “5. Mobile environment penetration,” combined for a ranking of eighth worldwide. Compared with the first-place ranking for “Infrastructure (improvement),” this could be called quite a poor ranking.

Furthermore, in terms of Utilization the overall ranking is 16<sup>th</sup>, a low ranking in comparison to Infrastructure (both Development and Penetration.) Looking at individual areas, Japan ranked ninth for “1. Individual utilization,” and eighth for “2. Corporate Utilization,” rankings comparable to the eighth place for of the Infrastructure (penetration) category, but in terms of “3. Government utilization,” the ranking is a low 18<sup>th</sup> place, making it clear that this is an area requiring particular effort and attention.

<sup>1</sup> With consideration for regional balance, availability of source data and continuity of data reporting, etc., the 25 countries selected were 1) Japan 2) the US 3) The UK 4) South Korea 5) Singapore 6) Sweden 7) Denmark 8) Italy 9) India 10) Australia 11) Austria 12) The Netherlands 13) Canada 14) Switzerland 15) Spain 16) Germany 17) New Zealand 18) Finland 19) Brazil 20) France 21) Belgium 22) Portugal 23) South Africa 24) Russia, and 25) China.

Figure 1-8 Overall ICT Progress: rankings by area and indicator



- ※ Figures on graph are all deviation values (numbers from the second decimal place onward rounded up or down.) Only the top five countries are shown (however, six are shown in cases where Japan ranks sixth or below)
- ※ Deviation values for each area represent the average for all indicators in this area (deviation values)
- ※ Values for the categories "Utilization (overall)," "Infrastructure (penetration) (overall)" and "Infrastructure (improvement) (overall)" are the averages of deviation values for all areas in each category
- ※ The value for "Overall ICT Progress" is the average of the deviation values for all indicators

(Source) Ministry of Internal Affairs and Communications "International Comparative Survey on ICT Infrastructure" (2010)

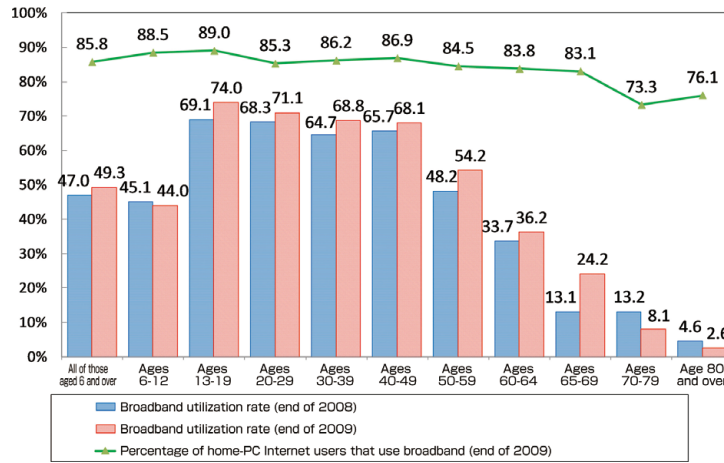
## (2) Current status of Japan's digital divide

Examining the status of broadband utilization by different generations of Japanese citizens, we find that for users between 13 and 59 years of age, there was over 70% utilization at the end of 2009 for all age categories, representing a year-on-year increase. However, for other age groups, in particular elderly, we find the utilization rate diminishing in accordance with increasing age, and the total rate of utilization for those 70 and over represents a decrease from the previous year (figure 1-9, upper half). In terms of the breakdown by area of residence, the rate was 55.8% in special wards of Tokyo, ordinance-designated cities, and prefectural capitals, 49.5% in other cities, and 35% in towns and villages. While all figures represent a year-on-year increase, there continues to be a major gap in utilization rates between urban centers and rural areas (figure 1-9, middle table)

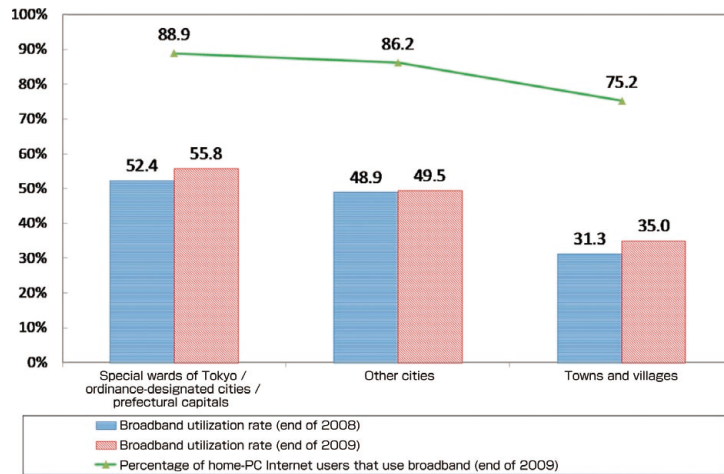
Furthermore, examining the utilization rate breakdown by household income level, as of the end of 2009 the utilization rate is over 50% for all households earning over four million yen annually, whereas for those earning under four million yen there is clearly a diminishing rate of usage correlated to lower income, with a utilization rate of 35.6% for households earning two million yen or more but less than four million, and 26% for those earning under two million yen per year (figure 1-9, lower table.)

Figure 1-9 Status of broadband utilization (by attribute)

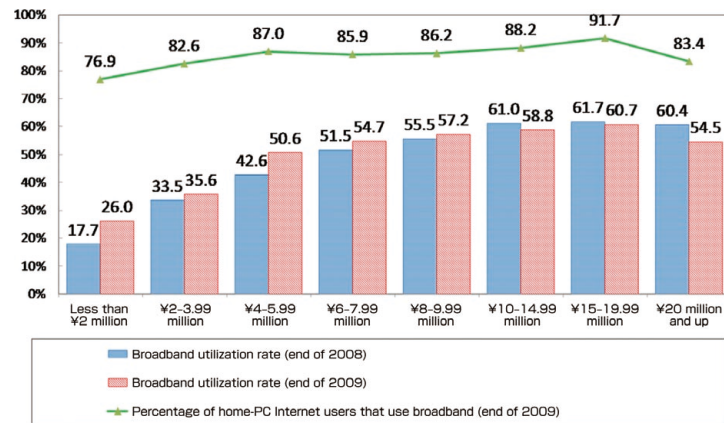
(by age group)



(By area of residence)



(By annual household income)



(Source) Ministry of Internal Affairs and Communications "Communications Usage Trend Survey" (2009)



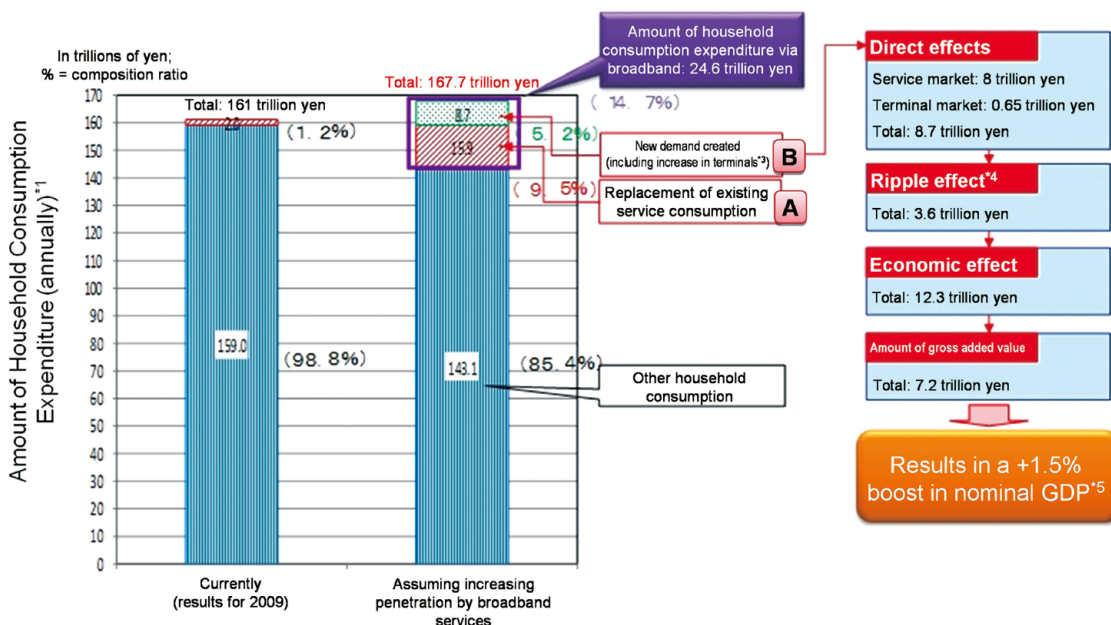
### (3) Economic values of broadband service penetration

In order for broadband penetration to extend beyond current levels so that all citizens can enjoy its benefits, it is essential for applications and services (broadband services) that meet the needs of a greater number of citizens, and can only be accessed using broadband, to gain in both quality and quantity. With this in mind, we have envisioned an environment that provides broadband services and their accompanying benefits to all potential users, and estimated the economic value according to an independently established logic model.

Increased penetration and enhancement of broadband service is expected to bring benefits to consumers, and when the consumer-side (end user) benefits are converted to economic value, the boost to the nominal GDP is estimated at up to 1.5%<sup>2</sup>.

In an environment fully pervaded by broadband services, 14.7% of household consumption could take place through the medium of broadband, and of this amount, 5.2% could constitute an expansion of the household consumption market derived from the benefits and benefit of broadband services. Of the expanded market, direct benefits break down as 8.0 trillion yen for the broadband services market and 650 billion yen for the terminal market (for a total of 8.7 trillion yen). When these direct benefits are added to the estimated 3.6 trillion yen in ripple effects, the total is 12.3 trillion in economic values (Figure 1-10).

Figure 1-10 Economic value derived from the penetration of broadband services (estimated)



- ※ 1: Based on the Survey on Household Consumption, Ministry of Internal Affairs and Communications
- ※ 2: Estimated based on the "total volume of expenditures via the Internet" given above
- ※ 3: Regarding the amount of increase due to terminals, for computers and televisions it is equivalent to the number of households, and for other types it is obtained by multiplying by the population (between ages 16 and 69) to calculate the total amount and then deriving the monetary amount per household
- ※ 4: Based on the 2007 ICT Input-Output Table
- ※ 5: Nominal GDP for 2009 (474 trillion yen) from the Quarterly Estimate of GDP (Jan – Mar 2010 Preliminary Report, May 20, 2010)

(Source) Ministry of Internal Affairs and Communications "International Comparative Survey on ICT Infrastructure" (2010)

<sup>2</sup> An analysis in the World Bank report "Information and Communications Report 2009: Extending Reach and Increasing Impact (<http://issuu.com/world.bank.publications/docs/9780821376058>)," also finds that a 10% increase in the broadband utilization rate correlates to 1.3% economic growth (1.38% for low and mid-income nations, 1.21% for developed nations)