

Chapter 1

ICT — Keystone of Economic Growth Strategy, and Its Expansion into the Global Market

Section 1

Road to Success driven by ICT

1. ICT and Economic-growth and Development — How ICT drives it.

In Japan, ICT has been studied as a driving-force of economic growth. At the same time, globally, keywords beginning with the “IT Economy” that emerged in 2000, “IT Economy,” “Broadband Economy,” and “Internet Economy” have recently attracted much attention as the driving force of the world economy. On the other hand, in the emerging countries or the developing countries, ICT is reportedly functioning as an engine of progress for democracy as well as the economy.

2. Two Paths in ICT-driven Economic Growth

Generally, ICT induces the following two direct effects on the economic development:

① **ICT industries drive the economy through their growth in production and job-creation.**

ICT industries, which consist of telecom-services, telecom-equipment production (information-infrastructure-equipment or terminals), and applications/contents, pull the economy through approximately 10% of domestic production they represent and production/employment inducement. In addition to the growth in the consumers' demand for telecom services/equipment, the growth in the internal investments and technology innovation in their own industries, which would be induced by the demand growth in corporate sectors due to the ICT employment as described below, will contribute to the enhancement of the industries' economic-driving force. As the US network-related corporations have shown, ICT industries where drastic technical innovations frequently take place have strong potential to create new businesses.

② **ICT introduction/enhancement in user corporations drive the corporate innovations and productivity improvement.**

Innovations by ICT in variety of products and services will create new types of products and services which could help ICT-user-corporations enhance their competitiveness, acquire new domestic/international customers, and create high added-value; in addition, those corporations could improve their labor productivity through streamlining the process of production/service-delivery enabled by the ICT investments, which means that they are able to supply more products/services in

less time.

3. Internet Economy Attracting Attention

The prediction that Internet will create a new market through its user-population growth — over 2 billion worldwide at present — and its acceptance as a social infrastructure, has been frequently discussed and studied around the world.

4. ICT, for Easing Constraint-Conditions and Problem-solving for Japan

ICT's innovation-inducement power should not be limitedly used for economic growth; it can serve as a driving force for easing the fundamental constraint-conditions that Japan is facing, such as the ageing society with a declining birth-rate, the budget deficits, declining labor population, and decline of local-economies, in addition to various other problems.

5. Developing Countries' Ascent from Poverty and ICT's Role

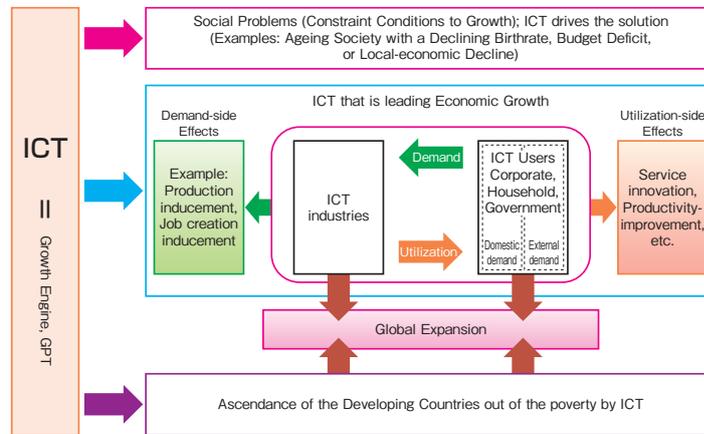
In developing countries, ICT is playing a critical role for the first-step of the ascent from poverty, as well as in promoting economic growth and solving other problems in the developed countries

6. How ICT Contributes to Japan's Economic Growth

ICT is expected to, as a GPT (General Purpose Tool) available in all fields, contribute to economic growth and play the role of a driving engine, in all types — developed, emerging, developing— of countries (refer to Figure 1-1-6-1). Digital Agenda, EU's ICT strategy, clearly describes in its introduction, the relation of ICT to growth as follows, saying that ICT is indispensable for us to work “smart”: “Faced with demographic ageing and global competition we have three options: work harder, work longer or work smarter. We will probably have to do all three, but the third option is the only way to guarantee increasing standards of living for Europeans.”

Also, Japan is required to utilize ICT in a similar way.

Figure 1-1-6-1 Method and Scenarios of ICT's Contribution to Growth



Prepared by Masahiko Shinozaki, et al. (2006 and 2008)

7. Analytical Framework

Taking the concepts presented above into consideration, the analysis and validation of the paths for Japan to take advantage of ICT for its growth will be presented below, specifically regarding the ICT user sectors including industry and the public, based on the question of whether Japan has taken advantage of ICT as a GPT.

Section 2

ICT Market around the World

1. Condition of Japan's Society and Economy

(1) Declining status

The trends in the real/nominal GDP growth rate as an indicator of our economy show the following: while the economy is experiencing mild deflation, the real GDP growth rate always surpasses the nominal GDP growth rate; recently in 2008 and 2009, because of the ripple effects of the Lehman Shock, the decline in the economy was so large that both the real and nominal growth rates became negative. While in 2010 the economy bounced back—the growth was 2.3% in the nominal rate and 4.4% in the real rate, in 2011 it fell back into sub-zero growth—2.8% below-zero for the nominal rate and 0.7% below-zero for the real rate.

Along with the long-lasting economic-stagnation, the overall unemployment rate (seasonally adjusted), although improved from the peak of 5.4% in January-Sep-

tember 2009, still hovers at a high rate of mid 4%.

The first thing for the country to do is to overcome this long-lasting economic stagnation.

(2) Ageing society with a declining birthrate and population decline

The total population of Japan, according to the estimates (birth/death rates) compiled by the National Institute of Population and Social Security Research will be 86.74 million in 2060, and the ratio of people aged 65 or older to the total population will grow in 50 years to 39.9% in 2060—two out of five people will be over sixty-five—from 23.0% in 2010.

As shown above, Japan will surely face rapid population decline and demographic ageing with a declining birthrate, therefore, Japan is required to have plans and measures for a different type of economic growth.

2. Globally Expanding Growth Potentiality of ICT

(1) World population and GDP

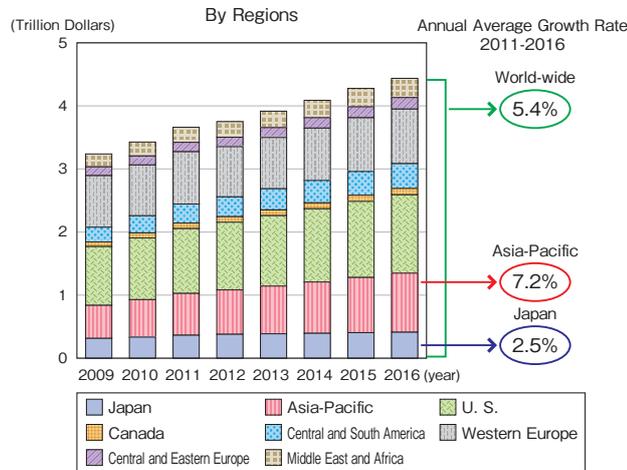
While the world population is estimated to have exceeded 7 billion on October 31 2011 and is expected to grow further, the mid-income countries,¹ which have a share of 84.5% of the world population and a 32.8% share of the world GDP, have displayed a level of economic-growth that cannot be ignored in the global market: for example, the GDP per capita of the mid-income countries has the momentum to grow, having shown over-two-digit annual average-growth rate over the last five

¹ The countries under survey (205 countries) in this report are classified as follows;

- High-income country (43 countries): GNI (Gross National Income) per capita exceeds 11,906 dollars
- Middle-income country (upper) (53 countries): GNI per capita is within 3,856 to 11,905 dollars
- Middle-income country (lower) (46 countries): GNI per capita is within 976 to 3,855 dollars
- Low-income country (63 countries): GNI per capita is below 975 dollars

* Note: the classification is defined by the World Bank (published in July 2009)

Figure 1-2-2-1 Predicted Amount of ICT Investment around the World



Prepared based on Gartner's survey

years.

(2) ICT investment

a. Status of the ICT investment around the world

The survey regarding the amount of ICT investment in the countries of the world shows that ICT investment is expected to grow in the developing countries, particularly in the Asia-Pacific regions, as well as the developed countries; the total amount of ICT investment around the world — 3.43 trillion dollars in 2011 — is expected to grow to 4.44 trillion dollars in 2016, at the estimated annual growth rate of 5.4%; as shown above, the amount of investment is predicted to grow. (refer to Figure 1-2-2-1)

b. Investment in telecom-infrastructure

The trends in the investment in telecom-infrastructure also show the following: the rapid growth of telecom-infrastructure-investment centered around the low-income countries, particularly the investment in mobile-infrastructure, is distinctive. At the same time, examination of the trends in the private-fund investment in infrastructure projects worldwide reveals that the telecom investment in 2010 is 71.29 billion dollars, next in size to the investment in the energy sector.

(3) ICT infrastructure development and dissemination

a. Spread of mobile-phones

The rapid growth rate of mobile-phones, particularly in the developing countries, is distinctive; it shows that mobile-phones have been increasingly adopted as a critical social infrastructure. The world-mobile-phone user-population has grown from 720 million in 2000 to 2.19 billion in 2005 and 5.36 billion in 2010; particularly in the lower middle-income countries, the user-population ratio to the total population has grown from 3.4% in 2000 to 68.3% in 2010; even in low-income countries, it has rapidly grown from 0.4% in 2000 to 49.2% in 2010. In such situations, the world mobile-user population ratio to the

total population is as high as 78.1%.

b. Spread of Internet and broadband

Backed by the growth of economy and the telecom-infrastructure-investment, Internet has rapidly spread, although its growth rate is still lower than that of the mobile-phone; the world Internet-user population, only 390 million in 2000, has grown to 1.01 billion in 2005 and 2.03 billion in 2010; particularly the adoption rate of Internet in the upper-middle-income countries has grown from 4.2% in 2000 to 37.2% in 2010. As a result, Internet population-share of the middle-low income countries has reached 61.2%. As for broadband, while it has been spreading mainly in the high-income countries, it has spread to a significant extent in the upper-middle-income countries, showing growth in users from 1.5% in 2005 to 8.1% in 2010; furthermore, the broadband user-ratio in the middle/low-income countries has already reached 45.1%.

(4) ICT utilization

a. Spread of Social Networks

In middle-low income countries, along with the ICT infrastructure, social-networks — contents-service belonging to the upper layer of telecommunication industries — have spread at a rapid pace; for example, the ratio of Facebook account-users to Internet users shows that Facebook has spread rapidly, while the Internet-user ratio to the whole population still varies according to income levels.

b. Adoption of Mobile-finance

Mobile-banking, one of the contents services provided by telecom industries, has been accepted in the middle-low income countries; the number of mobile-money-service-providers in the middle-low income countries, expanded from 19 as of January 2009 to 97 as of May 2011 and reached 124 in May 2012; the survey regarding

the mobile-finance-agent density (per-capita number of mobile-finance agents) and Bank ATM density (per-capita number of Bank ATMs) in the developing countries, showing the low density for ATMs and the high growth in the mobile-finance-agent density, suggests that mobile-finance is growing as a significant means of finance.

3. Developing Countries' Ascent from Poverty, and ICT

(1) Relationship between ICT-adoption Rate and Literacy Rate

The distribution diagram, plotting the spread-ratio of fixed-line phones, mobile-phones, and Internet in relation with the literacy rate used as a surrogate for the variable of education level, shows the following: around 1995, when the mobile-phone spread was not so extensive, fixed-phones were adopted only in the high-literacy-ratio countries (Figure 1-2-3-1): in the countries with high literacy-rates, as early as in 2000, mobile-phones caught up to fixed-lines regarding the spread ratio; in 2005, in the countries and regions with a literacy-rate of 50 to 80% (education level is estimated to be low) mobile-phones or Internet began to be boosted beyond fixed-line phones; in 2010, even in the countries and regions with literacy-rates less than 50%, mobile-phones spread rapidly, and also the Internet spread exceeded that of fixed-line phones. As a conclusion, in the last 10 years, ICT, particularly mobile-phones, began to widely spread in the developing countries as well as the developed

countries, even in the countries with low literacy rates.

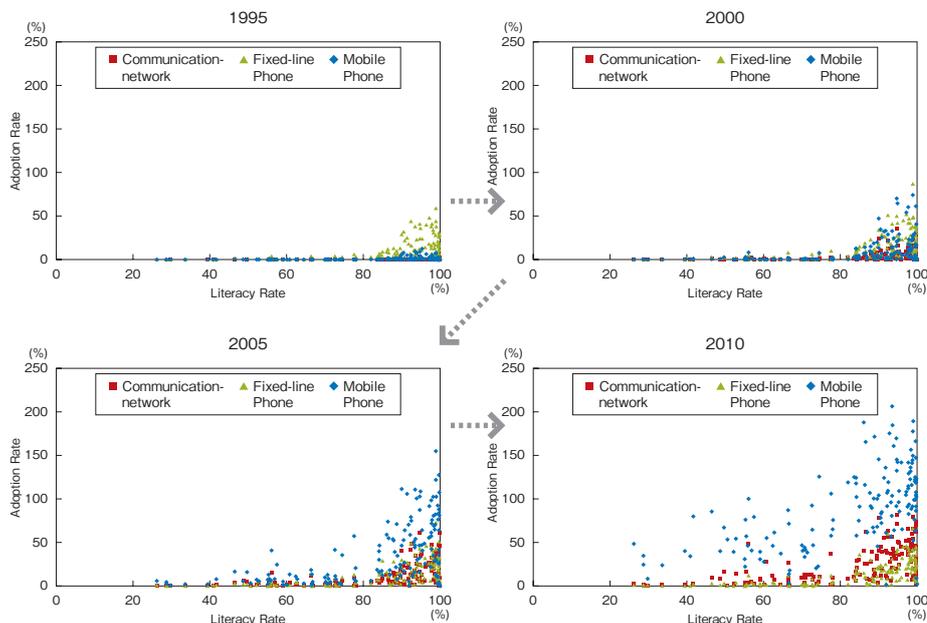
(2) ICT, the Unique Path to the economic development

Conventionally, the endogenous economic-progress mechanism is considered not to work well in the countries and regions with low income and low education levels, because of the low investment-capability resulting from the low saving rate (infrastructure constraints) or incapability of technology-introduction/localization (technology-utilization constraints). However, in the following growth-scenario driven by ICT: once the mobile-phones have spread in the society, their voice-features, triggering the use of SMS, bring more frequent opportunities for using textual information, and the mobile-phone application to micro-finance helps the people who have been previously kept away from the conventional bank-system participate in the money economy; as a result "the infrastructure constraints," or "the technology utilization constraints" are broken-down. As shown in this scenario, ICT including mobile-phone has a potentiality of accelerating the shift to the network-society.

4. Globally Acknowledged Growth-driving Force of Internet

Recently, Internet is attracting global attention for its economic growth-driving force; various analytical researches have been done, such as the World Bank's report released in 2009 on the economic effects of the

Figure 1-2-3-1 Distribution Chart of Literacy Rate and Fixed-line Phones Spread Ratio of Fixed-line Phones, Mobile Phones, and Internet



* Literacy rates are based on the available values since 2000.

Prepared based on "ICT provides dynamic and global effects on society and economy," by Akihiko Shinozaki and Yasumoto Sato, 2012.

broadband in the developing countries; particularly these days, the ICT economic/social-growth driving force such as Internet — referred to as Internet economy — has attracted attention globally.

5. ICT Strategic Activities promoted around the World

(1) International commitment in the declaration by leaders at the Deauville G8 Summit

Internet was discussed in G8 for the first time at Deauville in 2011; the leaders, acknowledging that Internet plays an important role as a source of economic growth, declared as follows: “Internet is a major motive force of the world economy, its growth and its innovation.”

OECD has carried out in-depth discussions on Internet economy, hosting its ministerial-level meeting of the ICCP (The committee for Information, Computer and Communications Policy) in Seoul, and the OECD high-level meeting focusing on Internet economy in Paris, France in June 2011, where the economic-growth and innovation promoted by Internet economy was discussed.

(2) Strategic activities by the organizations and governments around the world

Many countries, on the basis of the global acknowledgement mentioned in (1), have taken strategic actions for ICT infrastructure development and utilization, placing ICT at the key position for growth and innovation; many of those countries, where broadband is less available compared with Japan, have activities for ICT utilization in medicine or education, placing the enhancement of the broadband infrastructure at the center position of their economic growth.

Section 3

Growth Potential driven by Globalization of ICT

While the countries around the world, paying considerable attention to the economic-growth driving-power of ICT, have taken strategic actions, Japan, as pointed out in the previous status reports, has problems in ICT utilization in spite of its world-leading ICT environments. Furthermore, the ICT industries that have lead Japan's economy are losing their global competitiveness, in recent years.

This section, from the viewpoints mentioned above, at first analyzes the major international indices to reveal Japan's status in terms of ICT environment with regards

to infrastructure development, availability and utilization. Then, summarizing the contribution of the ICT industries to economic growth, analyzing the trends in the ICT industries, this section makes a factorial analysis on the competitiveness of the ICT industries.

1. Review of international indices for ICT

(1) Trends in major indices

A year-by-year comparison of the ICT international indices publicized by the organizations in the world, to provide a clear picture of Japan's status in terms of ICT, shows that, as for all the major indices, Japan is ranked at around 15th; Japan is ranked at 13th by the ICT's development index and at 16th by the EIU IT-industry competitiveness index, falling largely back from 2nd and 7th respectively in 2007; in the competitiveness ranking by World Economic Forum (WEF), Japan, although climbing from 19th in 2011, is ranked at as low as 18th.

(2) Spread of ICT infrastructure

a. Fixed-line infrastructure

The variation of the state of the fixed-line infrastructure spread from 2007 to 2010, by picking-up the fixed-line broadband and the FTTH spread, based on the statistics in the countries around the world is shown in Fig 1-3-1-1.

With regard to the fixed-line broadband, which is called in Japan a “technology having no room for innovation,” Japan is lagging behind other countries in terms of the spread ratio (Japan's ratio is 26.9% in 2010) and the ratio of broadband users to total internet users (Japan's ratio is 78.2% in 2010). On the other hand, with regard to the fixed-infrastructure, in terms of FTTH, advanced technology, Japan still leads other countries in the spread ratio (Japan's ratio is 62.5% in 2010) in the situation where other countries are improving the spread ratio. For example, Korea has come close behind Japan, with an FTTH spread ratio of 58.9% (in 2010), and Sweden has improved the ratio to 30.6% (in 2010).

With regard to the internet spread, Japan's internet users' ratio to its population is 79.1% as of the end of 2011, growing from 72.6% as of the end of 2006 with an annual growth rate of 6.5% in five years, displaying a ratio that is not high compared with the major developed countries. One of the reasons² is the low spread ratio particularly among seniors (age 55 to 64 or 65 to 74 according to the statistics) or low-income persons, showing distinctive differences in comparison with Norway, Sweden, Switzerland, and The Netherlands which have high internet users' ratio to the population from 85% to above 90%.

² Another reason is that for the internet spread ratio, ITU references the survey reports by the governments, where the definition, such as classification of generation layer used in surveys, differs government by government.

b. Mobile communication

A look at the state of Japan's mobile infrastructure shows the following: in comparison with other countries around the world, with regard to the 3G ratio (97.2% in 2010) and the mobile-internet-spread ratio (89.5%, in 2010), Japan is ahead of the others (Figure 1-3-1-2); however, with regard to the mobile-phone-spread-ratio, Japan is 23th of the 27 countries investigated. Korea, whose mobile-internet-spread ratio is 93.0% in 2010, 3G ratio is 81.3% in 2010, and mobile-phone-spread ratio is 105.4%, is competing with Japan in the mobile communication field. A comparison of the statistics of 2007 with those of 2009 shows that a large number of countries, including Australia, have improved both their 3G ratio

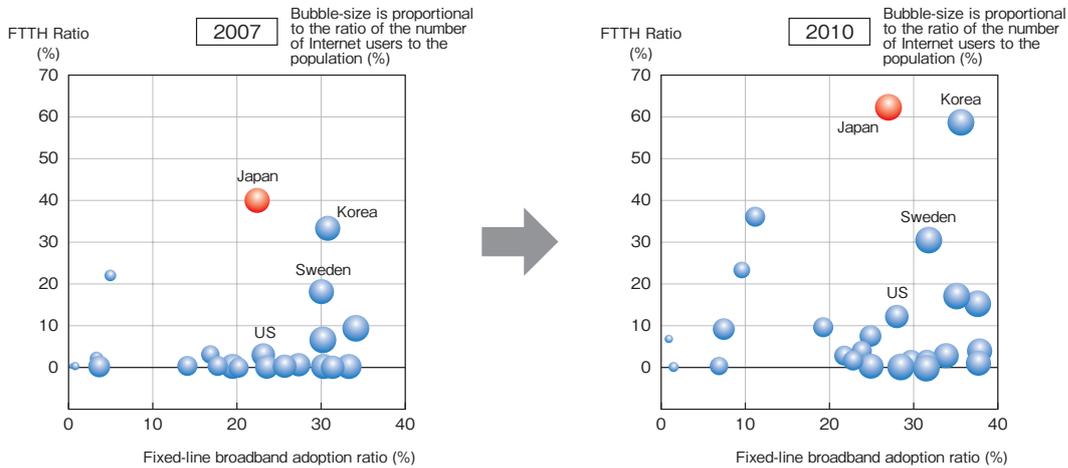
and mobile-internet-spread-ratio. What has been so far described suggests that Japan still has challenges in the promotion and utilization of general-purpose technologies in both fixed-line and mobile fields, even if the unique Japanese mobile-phone-market-structure due to the difference in "pre-paid" phone-business leads to Japan's relatively low mobile-phone-spread ratio.

(3) Utilization of ICT

a. Individual users

International comparison of communication tools (e-mail and others), e-commerce, and internet banking — most frequently used by individual users — shows the following: With regard to e-commerce among the three

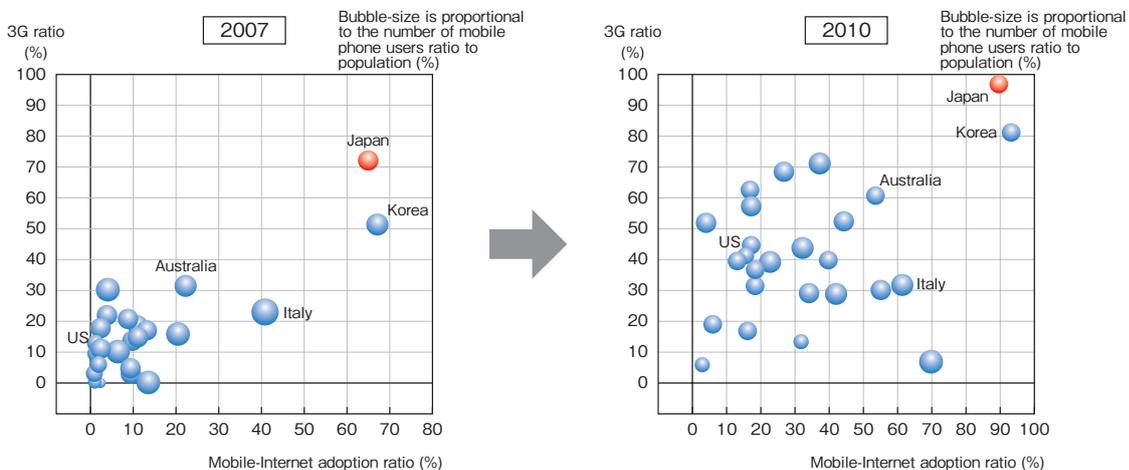
Figure 1-3-1-1 Fixed Broadband Spread Ratio, FTTH Ratio, and Per Capita Internet Spread Ratio



*27 Countries surveyed
 (Japan, Korea, China, Singapore, Italy, Canada, Austria, Netherlands, Finland, Swiss, Australia, France, US, NewZealand, Portuguese, UK, Germany, Spain, Belgium, Denmark, Sweden, India, Brazil, Russia, SouthAfrica, Norway, Malaysia)

(Source) MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

Figure 1-3-1-2 Spread Ratio: Mobile Internet, 3G, and Mobile-phone



*27 Countries surveyed
 (Japan, Korea, China, Singapore, Italy, Canada, Austria, Netherlands, Finland, Swiss, Australia, France, US, NewZealand, Portuguese, UK, Germany, Spain, Belgium, Denmark, Sweden, India, Brazil, Russia, SouthAfrica, Norway, Malaysia)

(Source) MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

services mentioned above, Japan, although the other countries are catching up, holds the leading position; as for communications and internet banking, the usage rate in Japan has been low for years; Scandinavian countries, on the other hand, are ranked high for both e-commerce and internet banking, showing that internet usage by individual users has been high.

b. Businesses

International comparison with regard to the broadband usage-ratio and e-commerce (buy and sell) usage-ratio by businesses shows the following: the e-commerce usage-ratio in Japan, although having reached 79.7%, is the lowest in the surveyed countries; as for the e-commerce usage-ratio, Japan is ranked at the low or middle level.

c. Public sectors

International comparison of Internet utilization by public sectors, by using the ratio of transactions by individual users in public organizations and the ratio of schools having Internet environments shows the following: as for each of those two indices, Japan is ranked lower than other countries surveyed (Figure 1-3-1-3), and particularly for the ratio of individual-user transactions in public organizations, Japan is ranked at the lowest with the ratio of 18.9%; Scandinavian countries, on the other hand, are ranked generally high, showing the high Internet-utilization in the public sectors.

(4) ICT-related industries and market

a. Marketization of Internet services

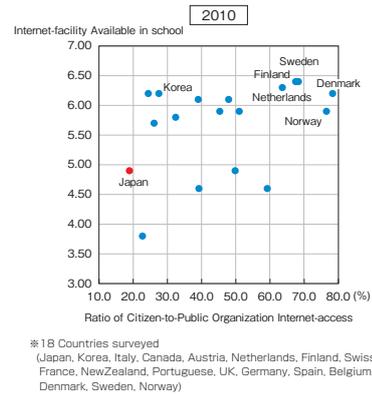
International comparison of the state of marketization of internet services with regard to the market-sizes of internet-advertising, internet-music-distribution, and online gaming, by using the media-usage share of the ser-

vices, shows the following: Japan, as the first runner in the high growth rate internet advertising and music-distribution segments, still holds a higher position than other countries in the survey; however, the U.K., Korea, and the U.S. are close behind Japan as shown in Figure 1-3-1-4.; Japan is eligible for certain praise for rapidly developing the internet-service industries and still holding the market size although in a limited area, and also is eligible for recognition for having held strength in the fields. However, at the same time, it has some problems with regard to expansion of the market.

(5) International-indices analysis and Japan's present problems and potential

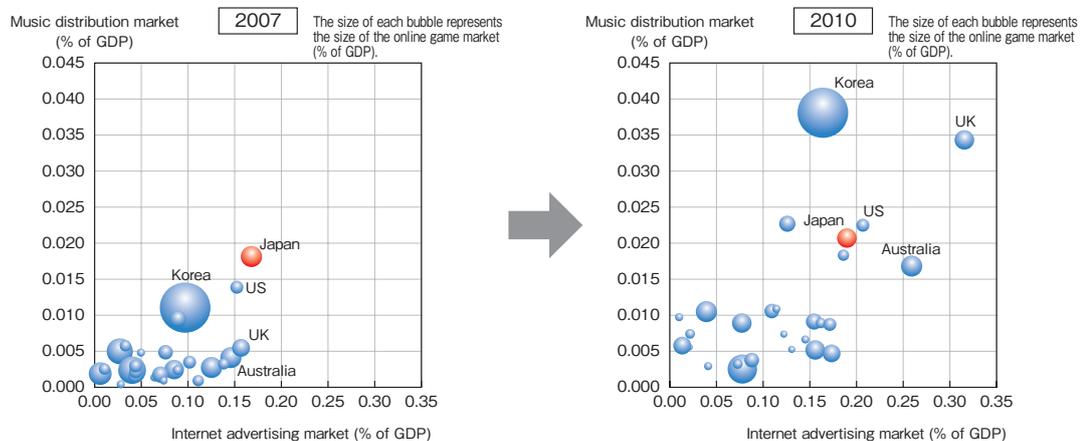
In many of OECD countries, ICT-investments have driven the economic growth, and they are expected to increase in importance as a driving force; those situations suggest that ICT-investments still have the role of

Figure 1-3-1-3 Relation of School Internet Development Ratio to Access Frequency by Individuals to Sites of Public Organizations



Based on MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

Figure 1-3-1-4 Trends in Relation of Internet Advertising Market Size to Internet Music Subscription, and Online Game Service



※27 Countries surveyed (Japan, Korea, China, Singapore, Italy, Canada, Austria, Netherlands, Finland, Swiss, Australia, France, US, NewZealand, Portuguese, UK, Germany, Spain, Belgium, Denmark, Sweden, India, Brazil, Russia, SouthAfrica, Norway, Malaysia)

(Source) MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

economic-driving force.

The latest year-by-year analysis of the international indices shows the following: Japan, with regard to ICT infrastructure and technologies where Japan traditionally have been regarded as a leader, has matched by other countries; on the other hand, in the advanced fields such as FTTH, mobile-Internet (including 3G), and IPv6, Japan still holds its advantages; however, with regard to the ICT-utilization, Japan, concerning Internet utilization, is failing to successfully utilize Internet for solving its problems, is showing signs of retreating. In addition, as for the ICT utilization, which has been pointed out as a challenge, Japan is not able advance in the international rankings, partly because the superiority that Japan has had in the business sectors is eroding as a result of the activities that other countries have taken.

However, it should be pointed-out that Japan, having advantages in the mobile-Internet which is globally expected to grow, and possessing a large domestic market with the most skilled and sophisticated consumers around the world and advanced technologies, still has many promising fields of high growth potential.

Because the present severe situations seen in the Japan's ICT fields are considered to have resulted from the failure to take advantage of Japan's strengths — for example the lag seen in the ICT utilization, Japan has a chance to overcome those situations and once again lead the other countries by the activities being taken from now.

2. Economic ripple-effects of ICT industries

(1) ICT Industries' Economic Ripple Effects

The sector-by-sector analysis of the economic ripple-effects of ICT industries shows the following: the plus factors reside in the information-services, telecommunication-services, broadcasting services, Internet-related services (Figure 1-3-2-1), the total gains of which ex-

ceeds the losses in the hardware industries; for example, while the economic-ripple effects by the hardware industries have been decreasing since the Lehman Shock the economic ripple-effects of the upper-layer and network-infrastructure layer, have shown gains sufficient to drive the growth of the ICT industries as a whole — particularly, the services related to the ICT upper-layer have a large job-inducement power, which is a side-effect of labor-intensiveness of those businesses.

(2) Contribution to export and import

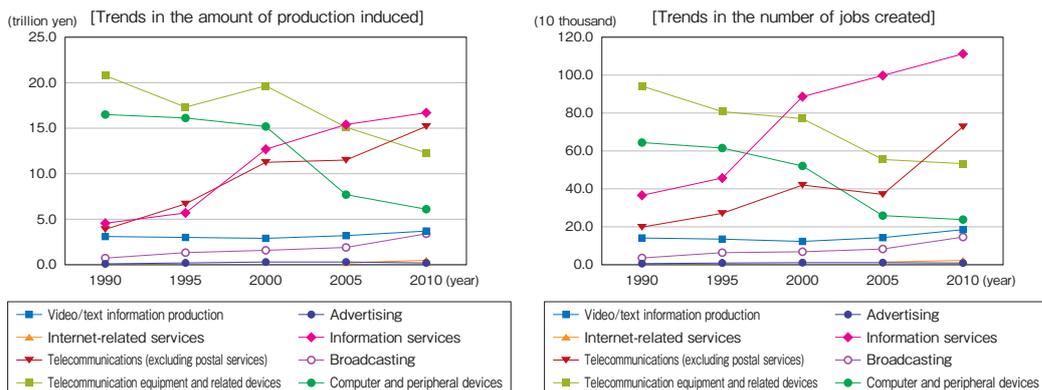
The trends in the export coefficient (Figure 1-3-2-2) of a good — the net export, the export surplus over the imports, divided by the sum of the exports and imports — show the following: the decline in the export coefficients, an indicator of the global competitiveness of an industry, has accelerated for ICT-related goods, showing that, from the viewpoint of trade, ICT related goods, particularly image equipment or communication equipment, have been gradually losing their competitiveness.

3. Competitiveness of Japan's ICT industries

(1) Corporate values in ICT industries (stock-market capitalization)

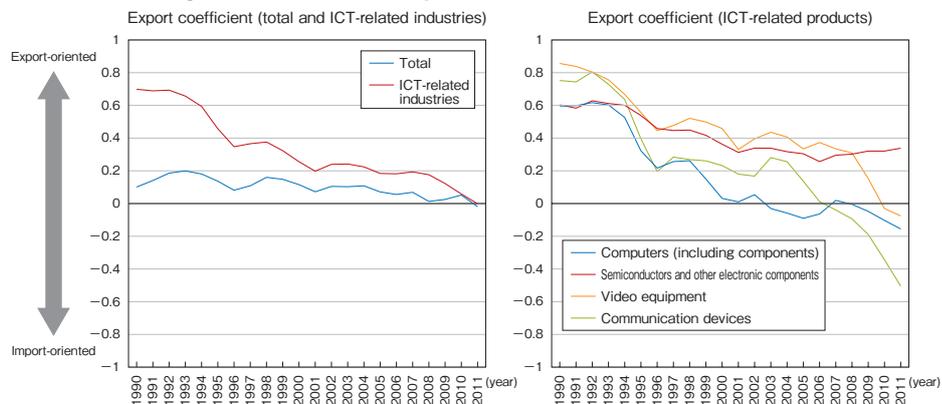
The analysis on the stock-market values of the ICT-related corporations, for the purpose of viewing the status of Japan's ICT industries, shows the following: the number-ratio of the Japanese ICT-related corporations in the top-100 highest market-capitalization ranking, in the past generally 5 to 10% (except for 2011), declined significantly from 2003 to 2012, which is the evidence of the Japanese ICT corporations' fall in the top-100 ranking; on the other hand, US corporations such as Apple or Google and Asian corporations such as Samsung, Korea improved their positions in the ranking.

Figure 1-3-2-1 Trends in Economic Ripple-effects of ICT industries



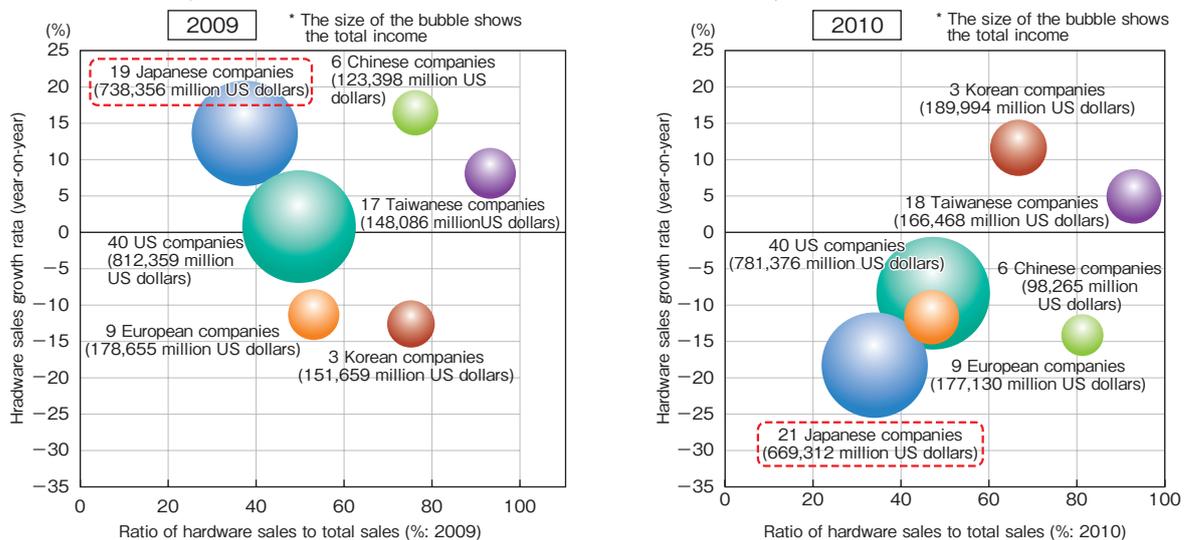
(Source) MIC "Research and Survey on Current State of Information and Telecommunication Industries (2012)"

Figure 1-3-2-2 Trends in Export Coefficient of ICT-related Industries



(Source) MIC "Research and Survey on ICT's Effects on Economic Growth" (2014), using MOF "Foreign Trade Statistics"

Figure 1-3-3-1 Comparison of Top 100 Hardware Manufacturers by Location of Headquarters



(Source) MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

(2) Performances of ICT-related corporations in sales

a. Comparison of hardware-related corporations: by-country/region (headquarter location)-analysis of the performance of the corporations in the top-100 sales ranking

The analysis of the hardware-sales ratio and sales-growth rate of the ICT-related corporations show the following: while the Korean or Taiwanese ICT-related hardware corporations have been continuously growing; those in the US, Europe and China have shrank; particularly, the Japanese hardware corporations have shown a sharp decline in sales — showing 13,5% growth in 2009, but a 18,4% decline (Figure 1-3-3-1) in 2010.

b. Comparison of software-related corporations: by-country/region (headquarter location)-analysis of the performance of the corporations in the top-100 sales ranking

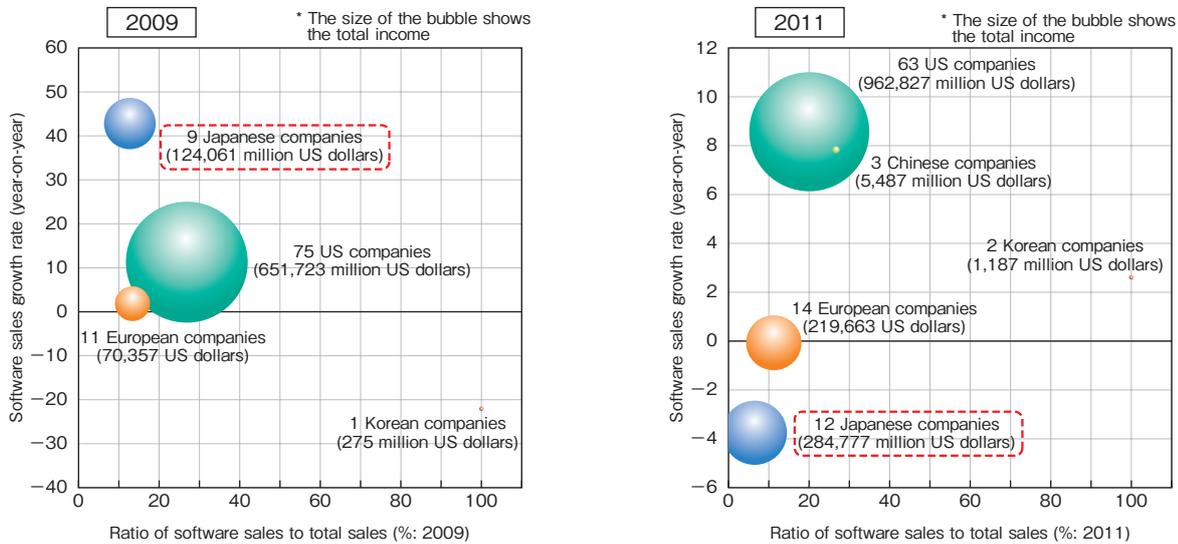
The analysis of the software-sales ratio and sales-growth rate of the ICT-related corporations shows the following: while US, European, and Korean corporations accomplished positive or even growth in each ratio, Jap-

anese corporations experienced sub-zero growth (3.8% below-zero). (Figure 1-3-3-2)

c. Country/region (headquarter location) distribution of the top-100 ICT service Vendors

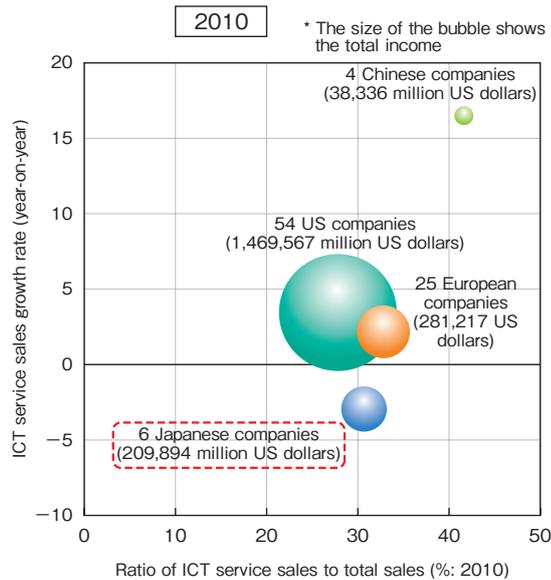
Analysis on the country/region-distribution (headquarter location) of the top- 100-sales ICT service vendors show the following: while US, European, and Chinese vendors accomplished positive growth, the sales-growth (from the previous year) rate of Japanese vendors is sub-zero (0.3% below-zero) (Figure 1-3-3-3); in addition, in the ICT service market, where US vendors have a large share, the sum of the share of Japanese vendors is as small as that of European vendors — however, not all US vendors have penetrated into the global market and obtained a certain market share, because of obstructions such as difficulties in localization of their services or products.

Figure 1-3-3-2 Comparison of Top 100 Software Manufacturers by Location of Headquarters



(Source) MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

Figure 1-3-3-3 Distribution of Top-100 Hardware Providers by Headquarters/Region



Based on MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

(3) Global share of ICT industries

a. Globalization of telecom operators

As for the Japanese telecom operators, while some of them have actively developed their overseas business, the ratio of their overseas-business to the total business is generally low; on the other hand, many of the other countries' telecom operators, particularly European operators who occupy the high positions in the global-sales ranking, have actively developed their global businesses.

The sales-to-GDP ratio and the number of overseas subsidiaries show the following: European, Middle East/Africa, or Asian major telecom operators have

achieved a high sales ratio to the GDP of their home countries; it suggests that such telecom operators put emphasis on overseas business; particularly, European operators have grown in sales by acquiring overseas operators.

b. Globalization of ICT vendors

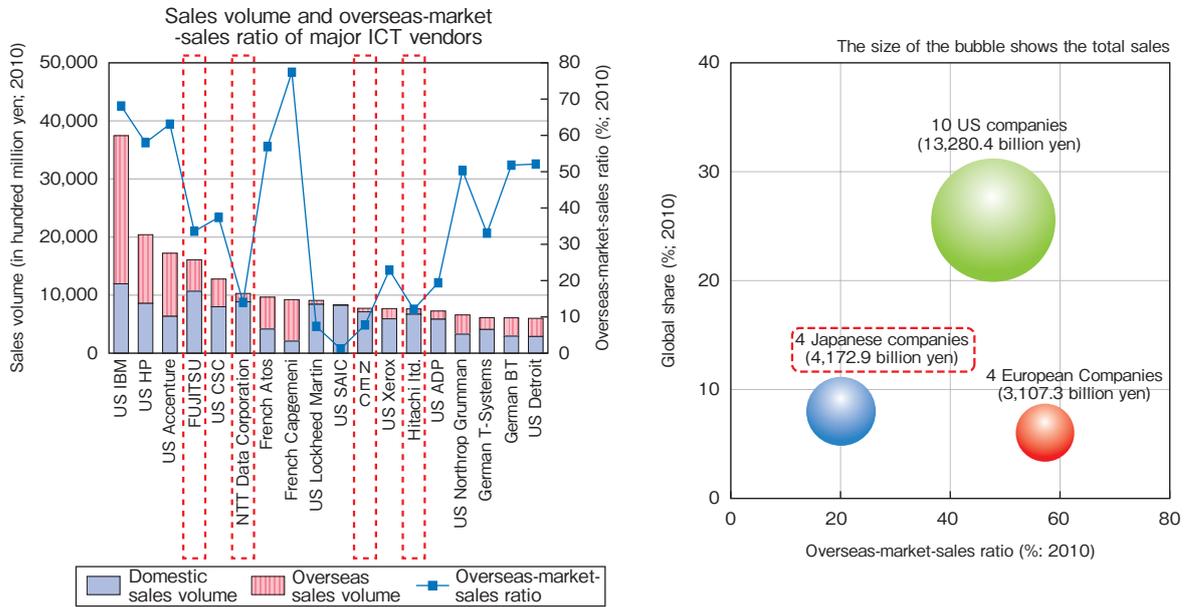
The overseas business-sales ratio to the total sales of the major telecom operators around the world show the following: Japanese major ICT vendors, in terms of overseas business development, have lagged behind US or European major players; US operators, generally having a large total sales and, at the same time, a global share as large as 25.7% (Figure 1-3-3-4), have a relatively high overseas sales ratio of 47.7% despite their large domestic sales of approximately 6.9453 trillion Japanese Yen; Japanese operators with smaller sales than US operators, are domestic-market oriented, having a global share of 8.1%, and an overseas-sales-ratio-to-total sales of 20.1%; on the other hand, European operators, with smaller sales than those of US or Japanese operators, are aggressively developing their overseas business, having a global share of 6.1% and an overseas-sales-ratio-to-total sales of 57.3% which is higher than that of North American major operators.

c. Globalization of manufacturers

a. Analysis on ICT global competitiveness indices

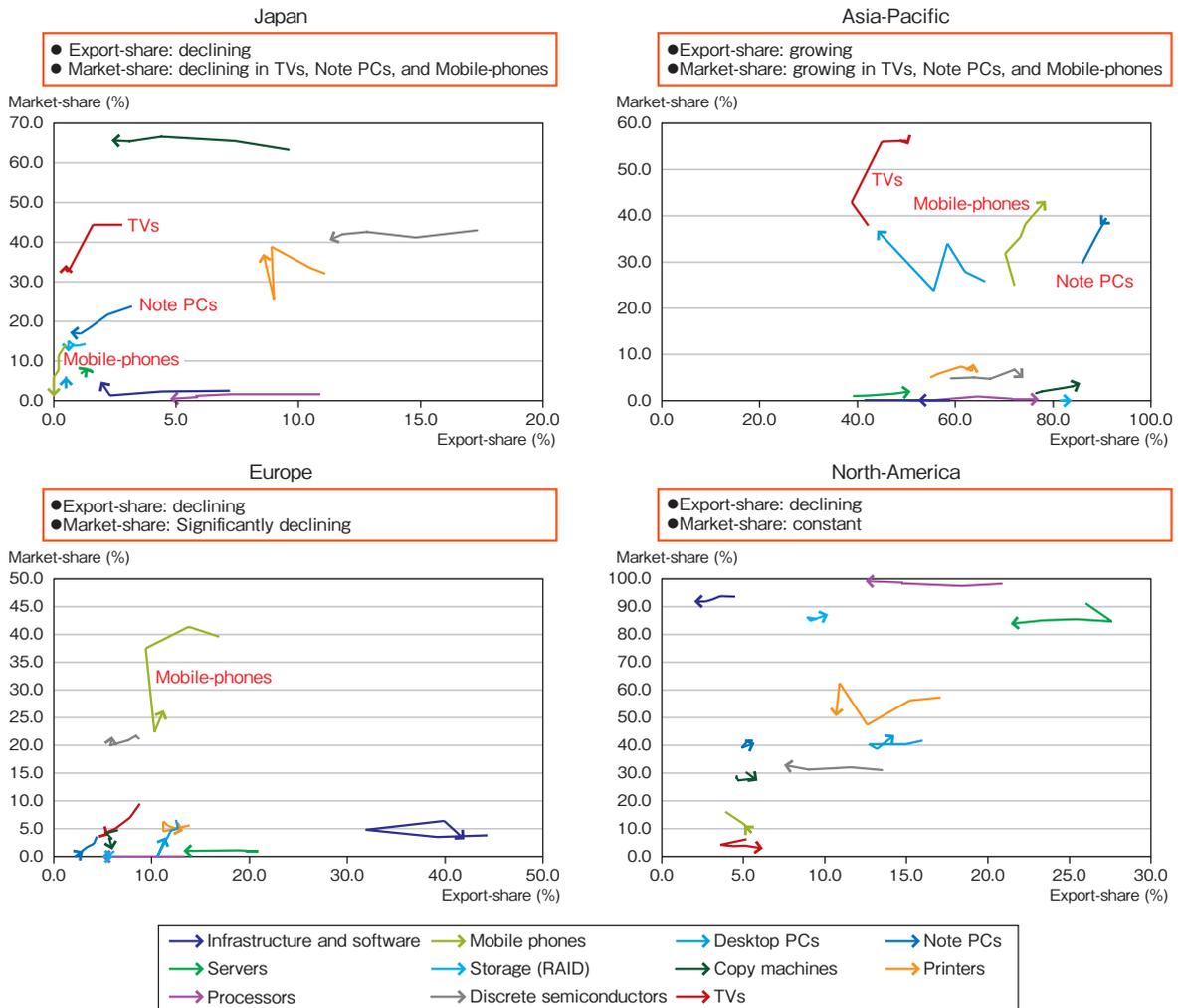
The analysis of the five-year trends in the global competitiveness of Japan, Asia/Pacific, Europe, and North America shows the following: the Asia/Pacific's export share has increased (Figure 1-3-3-5), and also its market shares for TV sets, mobile-phones and PCs have increased. Such situations suggest that Asia/Pacific has gained not only in export-competitiveness but also in corporate-competitiveness through the im-

Figure 1-3-3-4 Sales volume and overseas-market-sales ratio of major ICT vendors



Prepared based on Gartner's survey

Figure 1-3-3-5 Five-year Variation of ICT International Competitiveness Index



Based on MIC "ICT Global Competitiveness Indices"

provement of their brand power; on the other hand, Japan, which has been losing its export-share and its market-shares in TV sets, Note-PCs, and mobile-phones, is in a difficult situation with regard to both export-competitiveness and corporate-competitiveness; Europe, in the same situation as Japan, has been losing its export-share and market-share, showing a large decline in mobile-phone share; on the other hand, the US, which is losing its export-share in a manner similar to Japan and Europe, distinctively maintains its market-share.

b. Global production-share and EMS-utilization

Analysis of the global production-share of LCD TV-sets and mobile-phones in relation with the EMS-production ratio shows the following: Korean corporations have acquired a large share through their large-volume in-house production; US corporations, while having small shares, have attained highly-efficient production through the aggressive use of EMS — international production-specialization; on the other hand, the EMS-production ratio in Japanese corporations is 44.9% for LCD TV-sets and 20.1% for mobile-phones; as for mobile-phones, a comparison with the statistics in 2002 shows that, while Korean corporations have shifted to in-house production, US corporations have aggressively promoted the international production-specialization by EMS as Apple has distinctively adopted the “selection and focus” strategy.

(4) Toward the enhancement of the global competitiveness of Japanese ICT industries

The analysis described above reveals the following; the global competitiveness of Japanese ICT industries are declining particularly in the hardware sector; US corporations, attaining production efficiency through

international-production specialization, have maintained their brand-shares; in contrast, Korean corporations, utilizing their mass-in-house production capacity, have maintained their brand shares; US and Korean corporations share the policy for maximizing their strengths by focusing on the global market at the beginning and fully utilizing their management resources through in-depth selection and focus.

As for ICT service vendors and telecom operators, it is hard to say that Japanese corporations have successfully penetrated the overseas market; on the other hand, the counterparts in other countries have been aggressively penetrating the global market, focusing on the emerging market of the developing countries.

In the situations where Japan is facing the reality of the society with a declining population- and losing the growth capacity in its domestic ICT market, globalization is one of the important options for the growth of corporations; while strategies for taking advantage of Japan’s present strength will be effective, the strategy of focusing on the global market at the beginning will be required.

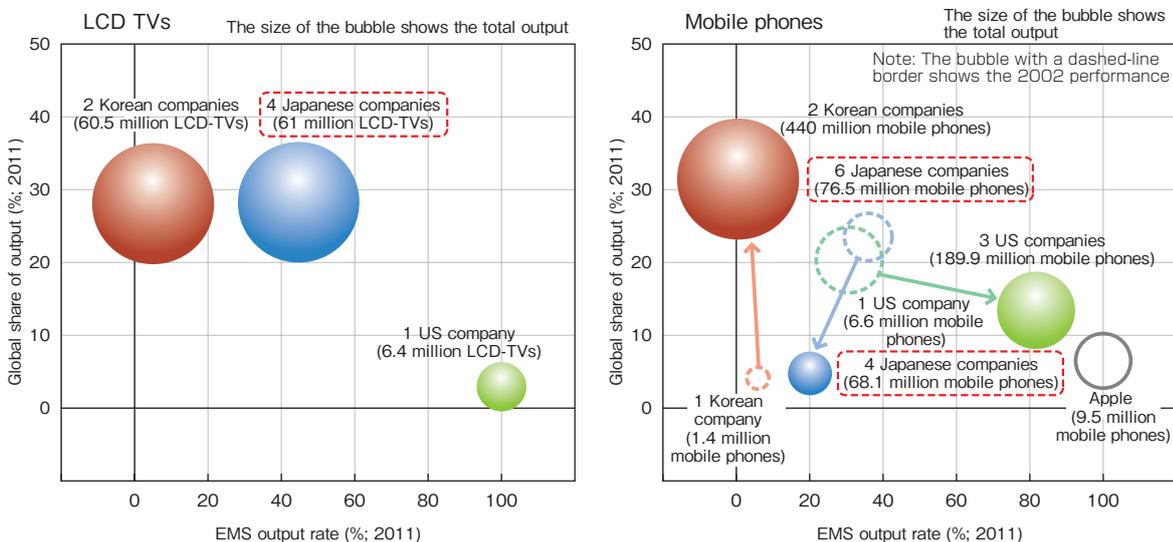
(5) Potential seen in the actual ICT global sales

a. Global expansion of infrastructure market

(i) Radio-communication Infrastructure

In emerging/developing countries, the infrastructure development focusing on mobile-phones have been progressing at a rapid pace; while the global market of radio-communication infrastructure-equipments in 2011 is 42.5 billion dollars, the telecom infrastructure-market in emerging/developing countries has already grown in Asia/Pacific, Middle East/Africa, as well as in North America and Western Europe; taking advantage of such market growth, Chinese corporations, as well as US or Europe corporations, have been taking aggressive ac-

Figure 1-3-3-6 Global Share and EMS Ratio of Manufacturers as for LCD TV and Mobile Phone



(Source) MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012)

tions— for example, the majority of the sales growth of Huawei (China) was accomplished in the market in the emerging/developing countries in Asia/Pacific, Middle East/Africa.

(ii) Development of smart-infrastructure (ICT-built-in social infrastructure)

Developed or emerging/developing countries around the world, based on the key-concept of smart-city/smart-community, have promoted the development of social infrastructure (utility or rail-road system) with ICT built-in. Furthermore, those countries have put efforts in packaged-export of social infrastructure with ICT under the government-business collaboration. The global market-size of ICT related goods or services included in social infrastructure is expected to grow to about 1.3 trillion yen in 2010, especially in Asia/Pacific market (Figure 1-3-3-7); such social-infrastructure related ICT market, providing new growth potential, has attracted various players.

(6) MIC's activities for global sales of ICT systems

MIC has already taken actions for the global sales of the ICT systems in which Japan has advantages, such as the ICT systems for disaster-protection/environmental problems or the Japanese terrestrial digital television broadcasting systems.

Section 4

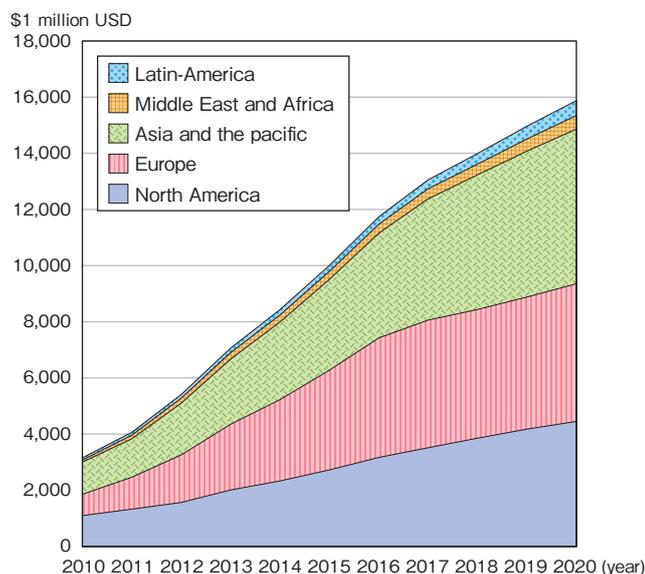
“Problem Solution” through ICT Innovation

1. Industry-by-industry Analysis of Growth Effect of Information Capital Accumulation

In order to make an industry-to-industry comparison of information investment, the “informatization progress index” is applied — an index calculated by the estimated difference of the marginal-productivity in an industry: the numerical inverse of the difference between the estimated marginal productivity of the ordinary capital and that of the information capital. The index indicates the progress of informatization in an industry reflecting the contribution of the added-value, in addition to the absolute stock value of the information capital stock.

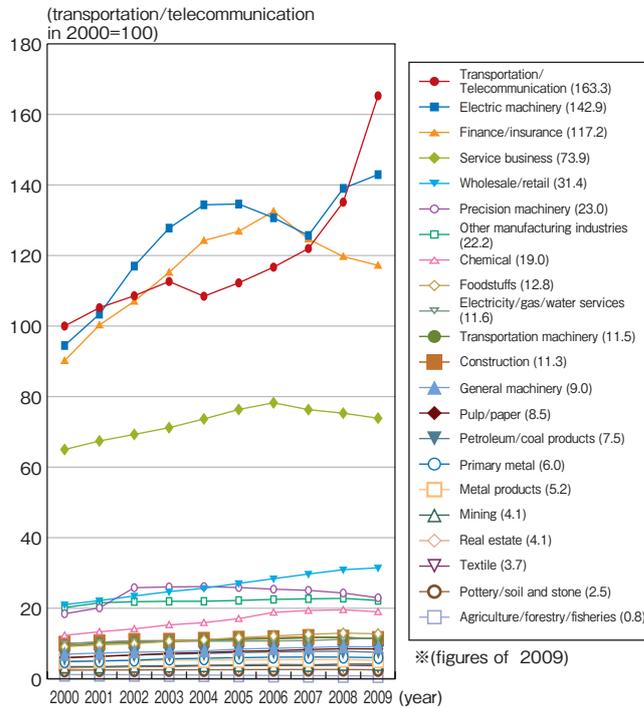
The informatization-progress-index analysis shows the following: the transportation and communication industry, the electrical machinery manufacturing industry, and the finance and insurance industry are ranked in the top three in the informatization-ranking (Figure 1-4-1-1). Note that the finance and insurance industry's index has been declining since 2006; on the other hand, the agriculture, forestry and fisheries industry, ceramic, stone and clay products manufacturing industry, and the textile manufacturing industry have lagged behind in terms of informatization investment.

Figure 1-3-3-7 Global ICT-related Market induced by Smart-Infrastructure Investment (Utilities, Transportation, Building, E-government)



Based on MIC "Research and Survey on International Comparison and Trends in Information and Telecom Industries and Services" (2012) and Pike Research "Smart Cities 2011"

Figure 1-4-1-1 Trends in Informatization Investment Rate in Industries



Based on MIC "Research and Survey of ICT's Effect on Economic Growth" (2012)

2. Evidence shown in the International Comparison of Contribution of Information Capital Accumulation to Economic Growth

Analysis on the index, calculated through the same method described above using the estimated marginal productivities of the ordinary capital and the information capital and their difference, show the following: in terms of information investment, Japan (its index is 19.2) is behind the U.S. (167.7), the U.K. (157.4), and Australia (285.5) (Figure 1-4-2-1); A close look at the trends shows that Japan, already behind the other countries before 2000, has lagged much farther behind since 2006; with regard to the marginal productivity difference of the ordinary capital and the information capital, the comparison of Japan's case to that of the U.S. shows that the difference in Japan in 2006 is the same as that in the U.S. in the early 1990s, indicating that Japan's lag relative to the U.S. is more than 10 years.

As a result, the analysis shows that Japan is not only lagging behind in terms of the growth in the absolute value of information capital stock, but that even when the added-value is included Japan is behind the U.S., the U.K., and Australia.

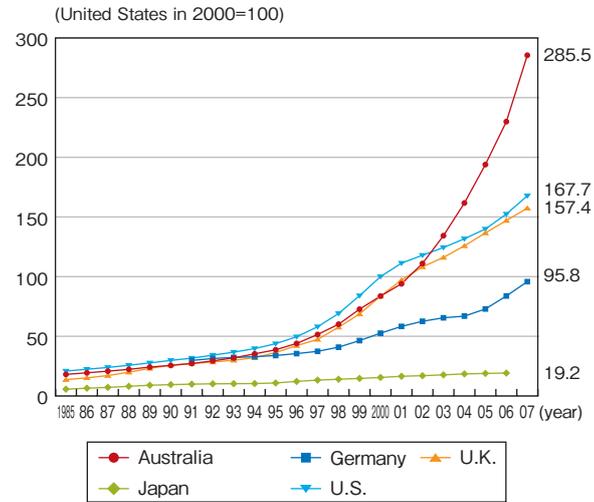
3. Growth Accounting Analysis on ICT's Contribution to Economic Growth

The analysis by the growth-accounting analysis-procedures of the contribution to the GDP growth rate of the TFP and information capital shows the following: in all the countries surveyed, the TFP and information capital have contributed to the economic growth; the contribution ratio of the ICT factors to the TFP growth rate is positive in almost all the periods, proving that ICT positively contributes to the productivity (TFP) growth (Figure 1-4-3-1). When it is acknowledged that the accumulation of information capital or the productivity improvement (TFP) by ICT utilization contributes to economic growth, the enhancement of the investment in ICT or the promotion of ICT utilization will clearly be the challenges for the economic growth of Japan, which is facing the reality of an ageing society with a declining birth rate.

4. Towards Economic Growth through ICT Investment and Utilization

While ICT capital contributes to economic growth in two different paths: directly — its accumulation directly drives the economy, and indirectly— through the im-

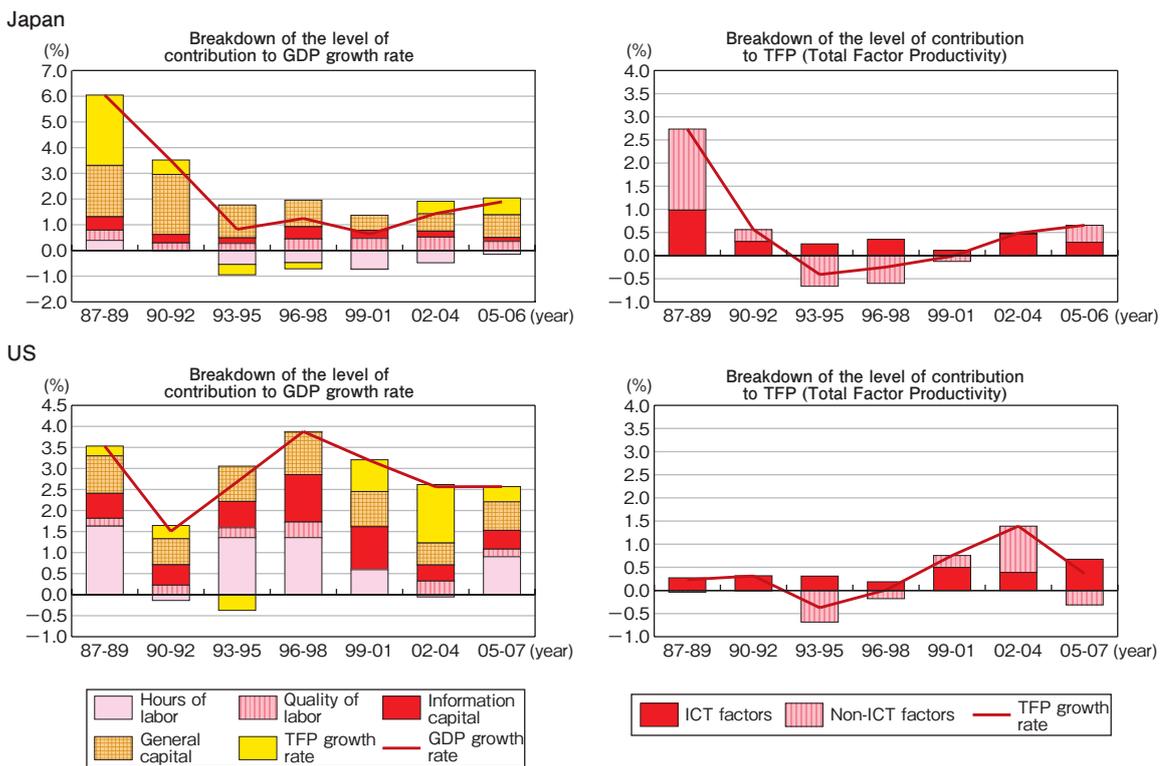
Figure 1-4-2-1 Annual Variation of Informatization Investment Index in Major Countries



※The data later than 2006 for Japan, and the data earlier than 1991 for Germany (the year of reunification) is unavailable due to the lack of EU-KLEMS data.

Based on MIC "Research and Survey of ICT's Effect on Economic Growth" (2012)

Figure 1-4-3-1 Contribution-distribution of Economic Growth-rate and TFP Growth-rate



※The data later than 2006 for Japan is unavailable due to the lack of EU-KLEMS data.

Based on MIC "Research and Survey on ICT's Effects on Economic Growth" (2014)

provement of TFP it indirectly drives the economy, Japan is facing problems in terms of these two paths.

The growth of ICT investment and growth of TFP shown in the general trends in the U.S. since the 1990s indicates that in the U.S. a positive cycle is established in such a way that ICT investment drives TFP improvement, the improved TFP drives the return of capital, and

the improved return of capital drives ICT investment. On the other hand, Japan, where the TFP has not been improved as much as in the U.S., is considered in a negative cycle in which ICT investment is not able to drive the TFP, and such ICT investment unaccompanied by TFP improvement, through the decline in the return of investment, results in the decline of ICT investment. It

means that Japan possibly fails to enjoy the economic growth that it would naturally receive.

As mentioned above, the combination of the acceleration of the ICT investment and the improvement of TFP induced by ICT utilization will be critical to the economic growth of Japan that is experiencing a reduction in its labor force. The next paragraph will, through the analysis of the replies of the business questionnaire, show what factors are considered to enable ICT investment or ICT utilization to contribute to economic growth.

5. ICT Utilization and Its Effects in Businesses

In order to see the difference in corporations that succeed in growing through the ICT utilization and corporations that do not, and furthermore how or through what factors, such as investment to intangibles, the ICT introduction in a corporation affects its productivity, or what effect the ICT-infrastructure introduction or utilization had on the management performance and business performance of the corporation, the questionnaire-analysis show the following in conjunction the types of corporate structure/business process innovations being conducted:

(1) The progress of ICT introduction and its effects

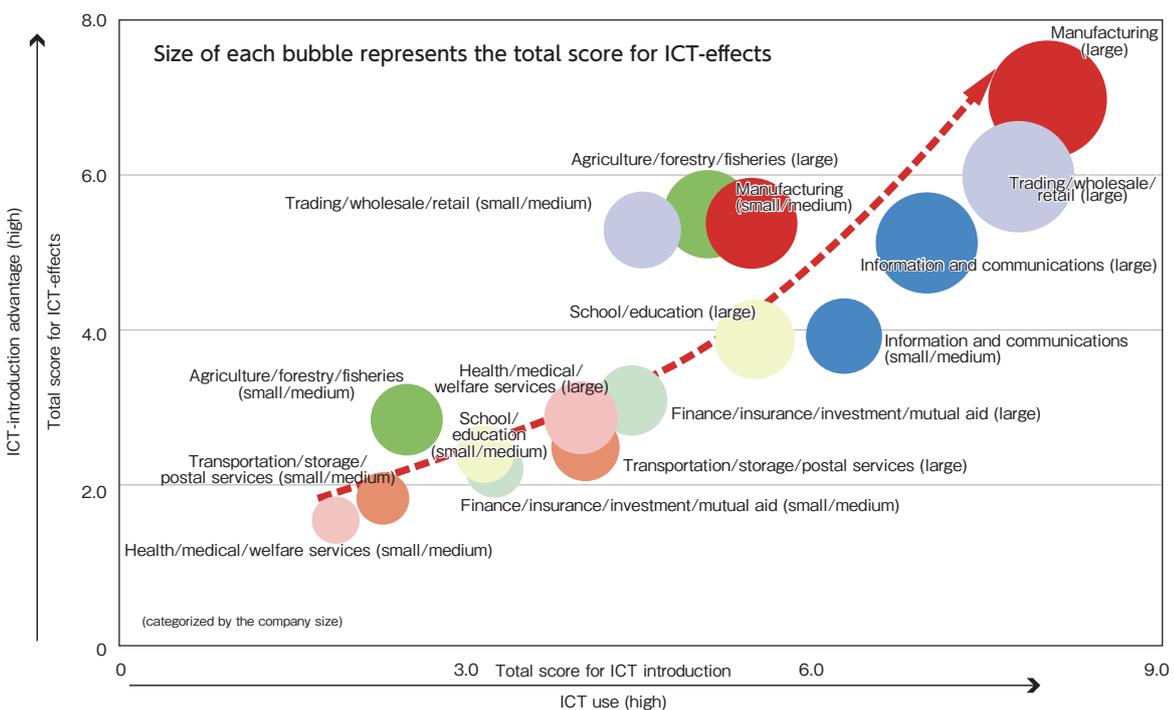
The analysis on the progress of the ICT introduction and its effects shows the following: the more the ICT

introduction proceeds in a corporation, the more positive effects they enjoy and the more they accomplish business/organization innovations (Figure 1-4-5-1). In any business sector, the larger an organization is, the greater the progress of the ICT introduction and the innovations, and the greater number of benefits the organization enjoys. The ratio of ICT utilization is higher among manufacturing corporations and large commerce/whole sales/retail corporations (note they are large corporations), and they enjoy more positive effects; on the other hand, for health/medical/welfare (note, they are small and medium-sized corporations) or agriculture, forestry and fisheries corporations (note, they are small and medium-sized corporations), the ratio of ICT utilization is low and fewer positive effects are enjoyed.

(2) ICT-introduction and business innovation activities and ICT introduction effects

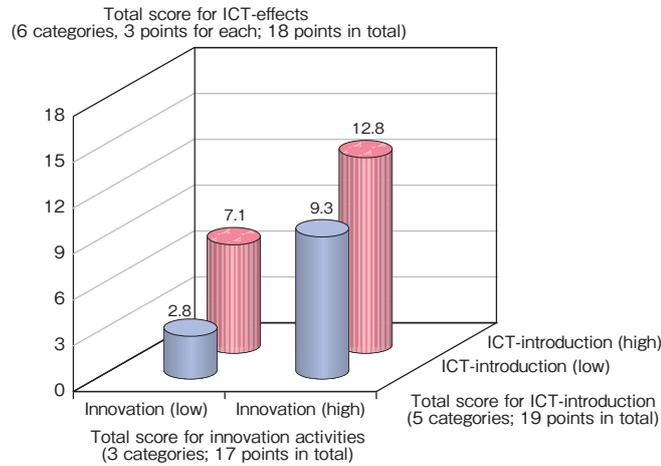
The analysis of the relationship of ICT introduction and business innovation and the effects of ICT introduction shows the following: the combination of ICT introduction and business innovation increases the positive effects (Figure 1-4-5-2); the corporations that promote the combination of ICT introduction and business innovation are more likely to grow than the corporations seeking growth only by ICT investment, which is evidence that the management activities such as corporate-structure reform, human resource fulfillment and validation of ICT-introduction are likely to result in productivity

Figure 1-4-5-1 Comparison of Contribution of ICT introduction to Corporate Innovation or Efficiency by Industries and Corporate-size



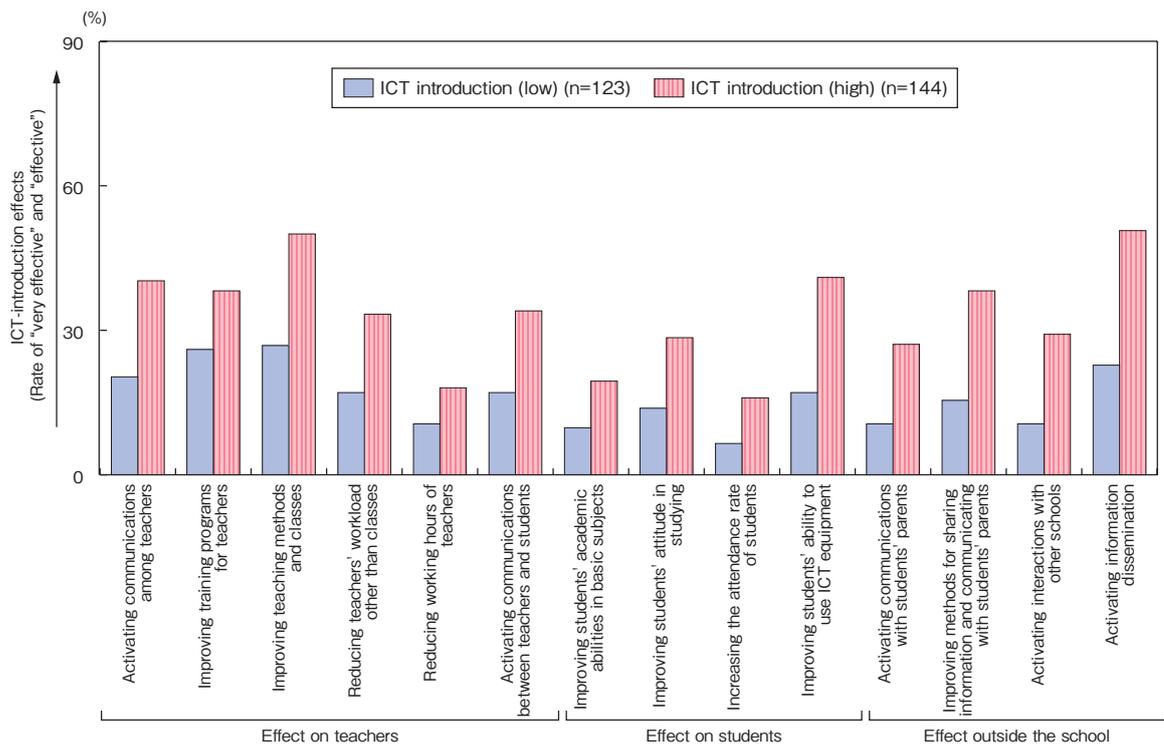
Based on MIC "Research and Survey of ICT's Effect on Economic Growth" (2012)

Figure 1-4-5-2 Relation of ICT-introduction Effects and ICT-Introduction Extent, ICT Investment Extent



Based on MIC "Research and Survey of ICT's Effect on Economic Growth" (2012)

Figure 1-4-6-1 ICT-introduction in Educational Organizations and Its Effects



※ ICT introduction (high) means Industry average of ICT-introduction score is 4.6 points or more, and (low) means 4.6 points below.

Based on MIC "Research and Survey on ICT's Effects on Economic Growth" (2012)

growth.

Corporations are required to not only seek growth by ICT investment, but to promote corporate innovations at the same time.

6. ICT Utilization in Education Sector and its Effect

The analysis, based on the results of the previous

analysis of businesses, of how the ICT-utilization effects are acknowledged differently in the educational organizations that have actively promoted ICT introduction and in those that are not active in ICT introduction shows that the more an organization is active in ICT utilization, the more it enjoys the ICT-utilization effects (Figure 1-4-6-1).

7. Potentiality of ICT Utilization in Medical Sector

(1) Effects of ICT utilization in the medical sector

Generally, the promotion of ICT utilization in the medical sector is expected to provide a big benefit to the whole nation, not only to medical organizations; on the other hand, for the promotion of ICT utilization, the benefits brought by ICT utilization should be clearly presented because the cost of ICT-utilization has to be shared by medical organizations and others. However, so far in Japan, with regard to the presentation of the benefits and effects realized by the ICT utilization in the medical sector, only a few case-studies have gone beyond mere case introductions to offer quantitative evaluations.

The following paragraphs will provide quantitative evaluations based on the data and facts brought by the comprehensive survey of the evidence contained in the cases collected from a wide variety of fields.

(2) The framework of the survey and analysis

A “medical/health care field” consisting of medical, nursing care, and preventive medicine is assumed as a model representing the whole medical sector; according to a cross-relation analysis in the model, the three types of players — clients, medical organizations, and insurers — are picked-up as significant players; with regard to those players, the definition of the effect-items expected to be brought by the ICT utilization is possible, because, although the ICT-utilization effects will involve a variety of players, the typical activities in the medical sector are related to those significant players.

(3) Collection of evidence and evaluation

The survey and the analysis was carried out as follows: for each of the effect-items, domestically or internationally publicized documents, such as academic papers or articles/reports of cases were surveyed; the reports on the proof-of-the concept experiments/projects where public organizations were involved and the system-installment case-reports by medical organizations were picked-up in search of evidence, and at the same time, through the domestic academic-paper search on a database³, 205 papers were picked-up and then 32 papers expected to be useful for the quantitative evaluation of the effect-items, and in addition, other cases were collected through interviews; the calculation method for evaluation was reviewed; then with regard to the collected evidence, the quantifiable items were quantitatively evaluated.

As a result, with regard to the ICT-introduction effects recognized at present in the medical sector, 16 effect-

items were quantitatively evaluated and 9 effects-items were qualitatively evaluated.

(4) Calculation of quantitative effects

Before calculating quantitative effects, with regard to each of the effect-items eligible for quantitative evaluation, according to the estimated micro-level mechanism, the following were reviewed: who are the beneficiaries, what effects or benefits are expected, and to what medical systems ICT is applied; then, the mathematical expression for benefit-calculation was formulated; finally, the effects or benefits were obtained by using the formula.

Figure 1-4-7-1 shows the obtained quantitative evaluation of the effects in terms of the target medical systems and expense-items — medical expense, income/expense, and social benefits; the sum of the effects (100 millions of yen/year) of each item is 104.31 billion yen for the medical expense, 129.26 billion yen for the income/expense, and 313.71 for the social benefit. The analysis, although not covering all the medical systems, has provided sufficient evidence of ICT-utilization effects in the medical sector; therefore, the ICT-utilization in the medical sector is expected to provide more effects as the ICT introduction is promoted.

Note that the present method of analysis, being limited by the following constraints, will need further sophistication for the application in a specific field:

- Because of the constraints of the evidence, not all of the 25 effect-items are quantified, and some are only qualitatively analyzed.
- The quantification is limited to the effect-items for which the evidence is available from the results of the existing research, etc., and the items for which sufficient evidence is not collected are only qualitatively analyzed.
- Although to the extent possible, the calculations are based on domestic cases, some are based on the cases of another country because sufficient evidence was not available for the domestic case.

(5) Activities for ICT-utilization in the medical sector — Medical Information Integration Infrastructure (EHR)

Since 2011, the Ministry of Internal Affairs and Communication, for the purpose of the development of the wide-area EHR system, has conducted the proof-of-concept experiments on the computerization, medical file integration, medical-nursing care integration and sharing of patient registration cards, in three regions — Takamatsu City, Kagawa Prefecture, Onomichi City, Hiroshima Prefecture, and Izumo, Shimane Prefecture, as one of the “health Information Utilization Infrastructure Projects.”

The poll-surveys carried out in the three regions show

³ Japan Medical Abstracts Society's article search-service was used; on the Japanese and English article later than February 2002, the article search was conducted.

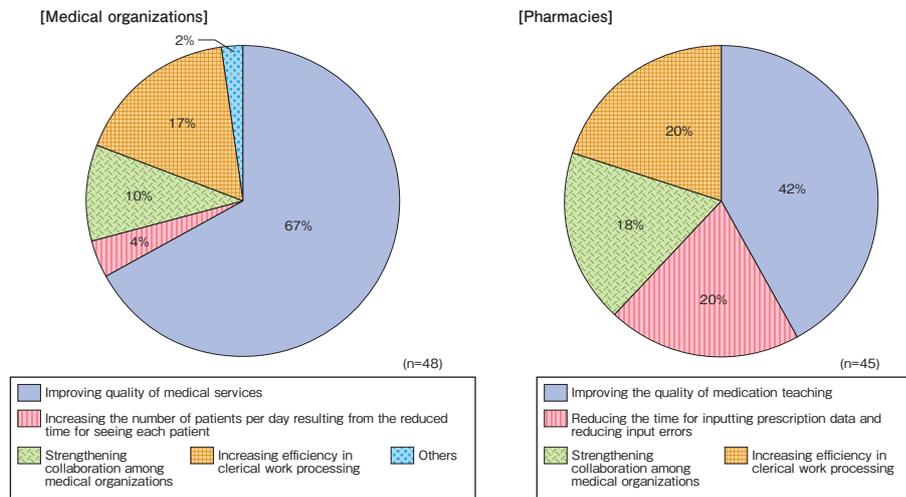
Figure 1-4-7-1 ICT-introduction Effects in Medical Systems

System	EHR: Electronic Health Record System (Including Receipt Computers)	Remote Medical Service (including Health Management Service)	Medical Institution Information System (including Ordering System, SPD, or PACS)	Others (Receipt On-line Billing System, Health Guidance Support System, Medical Web Service, Nursing-care Support System)	Total (100 million yen/ year)	
Estimated adoption ratio (Present)	14.3% (Electronic Health Record) —(EHR) Note 1	5.7% Note 8: 2.2%	26.4% Note 13 and 14: 17.1% and 36.1%	Hospital: 96.5%, Clinic: 42.7 (Note 23: 13.2%)		
Medical Expense	1 Avoidance of duplicated test or medication through information-sharing among medical organizations 20 Note 1 2 Avoidance of malpractice through client records sharing 18 284.4	5 Avoidance of severity through disease control 22 80.8 & 188.4 6 Hospital-stay-duration has been shortened because of availability of medical services at home 8 Improvement of QOL (Quality of Life) 379.1				1,043.1
Income / Expense			13 Improvement of Inventory Management 14 Realization of filmless-process by digital systems (ex. PACS) 15 Realization of paperless process and labor-expense reduction by digital systems (ex. Ordering System) 16 201.6 264.1 766.3	21 Streamlining of billing process and insurance-inspection process 24 57.3 23 Streamlining of health guidance 3.3		1,292.6
Social benefit		7 Reduction of hospital visits through medical service at home 114.3	4 Improvement of hospital work flow, and doctor appointment 3,202.8			3,317.1
Qualitative Effect	3 Quality-improvement and standardization of medical service through the utilization of data 10 Reduction of data-loss-risk by on-cloud-preservation of data 11 Efficiency improvement of medical product-development through the utilization of medical records, etc. 25	12 Enhancement of medical service menu	17 Improvement of hospital flow	9 Elimination of information-accessibility gap between hospitals and clients 19 Process-flow improvement for nursing-care service		

Note 1: N.A, because of no estimation available for EHR adoption ratio. It would be calculated as 22.03 billion yen if 10% were applied for the ratio.

(Source) MIC "Research and Survey on Socio-economic Effects of ICT in Medical Service Sector" (2012)

Figure 1-4-7-2 Effects of EHR utilization



Based on the results of the poll conducted in the three target regions of "Health Information Infrastructure Development Project"

the following: as the EHR effects, the medical-treatment quality-improvement, the medication-teaching quality-improvement, and the medical-transaction efficiency-improvement are favorably listed (Figure 1-4-7-2). In addition, the project is positively evaluated as follows: the overlap of medical tests is eliminated by EHR; the access to the EHR is increased before some types of health checks, by patients who want to know their own diagnosis and medication for the confirmation of their health conditions; on the other hand, it is pointed out as important that, for the EHR to be widely used, evidence of EHR effects should be accumulated, and the development of operation models should be continued.

8. National ID System: Promises and Challenges

(1) State of the social security number system and the national ID system in Japan

Social security/tax number systems, based on the premise that they assure accurate personal-identification, aim to construct a social infrastructure supporting residents' life through utilizing, in the administration of social security or taxation, the information on the residents' income and other information collected through "my number" assigned to each of the residents, and at

the same time, developing, under the local and central government cooperation, an ICT-based system enabling efficient and secured information-integration. In Japan, in February 2012, a “Bill for the use of a number for personal identification in administrative procedures” (my-number bill) was submitted to the 180th diet session (ordinary).

On the other hand, national ID systems aim to develop a system enabling, through utilizing IDs, efficient and secured information-integration among organizations possessing information. In Japan, since September 2010, the Taskforce on E-government set-up under the Planning Committee, IT Strategy Head Office has been studying such systems.

9. Users’ Recognition of Public ICT Services

The analysis, using the results of the poll survey, on how the residents recognize and use the major ICT services in “Administration,” “Medical Services,” and “Education,” and for what reasons the residents do not recognize those services shows the following in the paragraphs below. Note that questionnaires on the six services, “Electronic Submission,” “Tax Payment and Submission,” “Health Management Service,” “Remote Medical-care,” “On-line Training Material,” and “E-learning,” were delivered by mail and the replies were collected by mail.

(1) Recognition of Public ICT services

The analysis on the recognition of the public services show the following: while the tax submission/payment service (72.4% of the respondents recognize) is highly recognized, as for any of the other services, the number of the respondents who replied “Do not recognize” is larger than the number of the respondents who replied “Recognize” (Figure 1-4-9-1), suggesting that, for pro-

moting public ICT services, one of the keys is the high recognition of the services by residents; on the other hand, as for the ratio of the respondents who replied that they know what they can do by using the service to the respondents who replied that they only know the name of the service, it is 86.5% for tax submission/payment, and generally 70% for the other services.

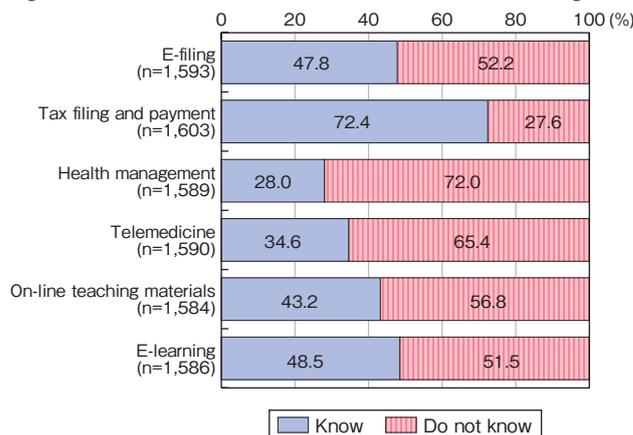
(2) User Satisfaction

The analysis on the user satisfaction shows the following: as shown by the high rate for the electronic submission service (91.3%), all the services obtain high user satisfaction ratings by almost all the actual users, suggesting that, in spite of the generally low usage rate, the actual users are highly satisfied; on the other hand, as for the expectation for each service, more than half of all the respondents replied “No interest,” showing a large disparity with the high satisfaction ratings given by the actual users, suggesting that the low service recognition affected their replies.

(3) Reasons for “No interest”: Comparison of the response to the questionnaires by local governments and the response by the residents

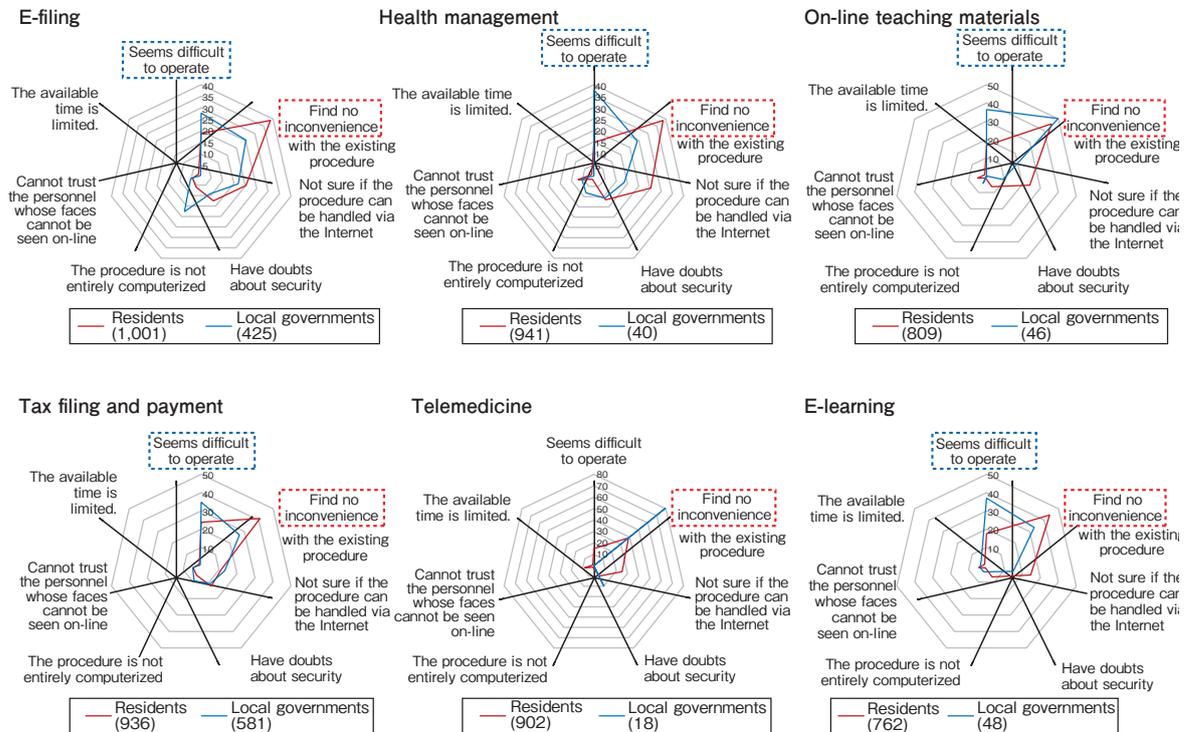
The analysis on why the service is not used shows the following: with regard to the responses by the residents, the answer “Feeling no inconvenience in using the conventional system” is most frequently chosen for almost all the services, and at the same time the residents are more likely to choose that reply than the local governments for many of the services (Figure 1-4-9-2), possibly suggesting that the convenience of service is not so well recognized by the residents as the local governments expect; on the other hand, the answer “Operation for the service seems not so easy” is not so frequently chosen, suggesting that the operation is not so heavy a burden as feared by the local governments.

Figure 1-4-9-1 How the Names of Public ICT services are recognized



(Source) MIC “Research and Survey on Trends of Users’ Recognition through the Improvement of ICT Infrastructure and Services” (2012)

Figure 1-4-9-2 Comparison of the Responses of Local Governments and Residents to the question: why are public ICT services are not frequently used?



※ The value of telemedicine is a reference data due to the small number of samples.

(Source) MIC "Research and Survey on Trends of Users' Recognition through the Improvement of ICT Infrastructure and Services (2012)", and MOF "Research and Survey on the Current State of ICT Utilization and its Economic Effects"(2012)

(4) Toward the frequently-used ICT services in public sectors

The surveys so far presented are summarized as follows: each of the services is not so well utilized, and furthermore, in the first place, not so well recognized; the most frequent answer to the question, "Why you do you not want to use the service?" is "Satisfied with the conventional system, feeling no inconvenience" suggests that the respondents who do not want to use the services do not perceive any advantage significant enough to justify abandoning the conventional system; on the other hand, among those who have used a system, the satisfaction ratio is generally high; the analysis so far suggests that for the utilization of ICT services, in addition to the activities to improve the recognition of the services, it is critical to communicate the benefits of the services to those who have not used them in an easy-to-understand manner.

Section 5

ICT: Driving Force of Local Economy

**1. Effects on Local Economy
Growth of Building and Global Deployment of a New-type Community by All-round Application of ICT**

The Ministry of Internal Affairs and Communications, aiming to create new-types of local communities, has held meetings of the "Panel for ICT-based Community Development and Globalization" since December 2011 (refer to (3)), and recently conducted poll-surveys targeting local governments to see how they recognize the ICT-based community development.

(1) State of ICT-utilization for community development

First, the analysis on the preparation of strategies for local community administration shows that only 30% of

Figure 1-5-1-1 State of the strategy-preparation and plan-execution for the local-community management

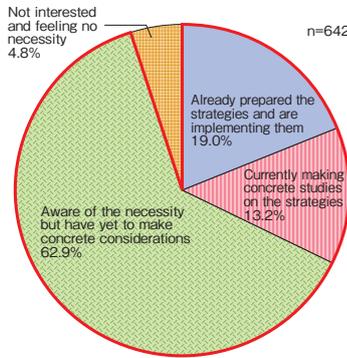
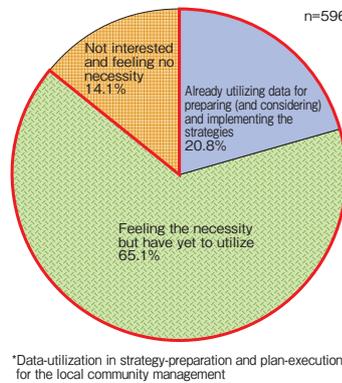
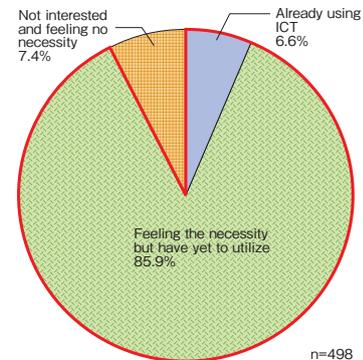


Figure 1-5-1-2 Data-utilization in strategy-preparation and plan-execution



*Data-utilization in strategy-preparation and plan-execution for the local community management

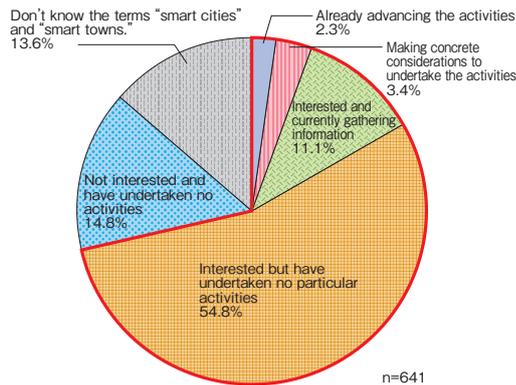
Figure 1-5-1-3 ICT Introduction in Data Utilization



*Targeted were the local governments that were implementing and examining strategies for local community management and also implementing and feeling the necessity of data utilization.

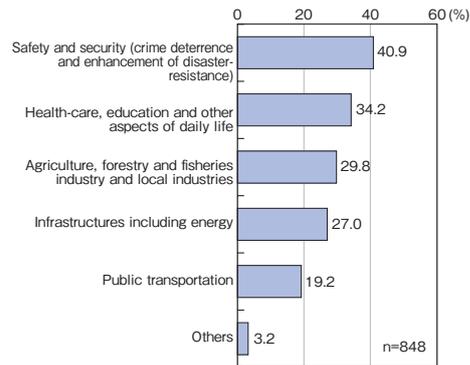
(Source) MIC "Research and Survey on the Current State of ICT Utilization and its Economic Effects in Local Community" (2012)

Figure 1-5-1-4 State of the activities for ICT-based local community development



(Source) MIC "Research and Survey on the Current State of ICT Utilization and its Economic Effects in Local Community (2012)"

Figure 1-5-1-5 What is the most promising field in ICT-based local community development?



(Source) MIC "Research and Survey on the Current State of ICT Utilization and its Economic Effects in Local Community (2012)"

the local governments have already reached the phase of study or preparation of such strategies, and about 60% are still in the phase where they, although recognizing the necessity of such strategies, have not started studies (Figure 1-5-1-1); out of the local governments that responded that they are in the phase of study or preparation, concerning the question of whether data-utilization was being employed in the strategy study or preparation, 20.8% replied yes, and 65.1% replied that they, although recognizing the necessity of data-utilization, are not in such a phase; concerning whether ICT was being utilized in data-utilization, 6.6% replied yes, and the 85.9% replied that they, although recognizing the necessity, are not in such a phase (Figure 1-5-1-2 and 1-5-1-3).

The result of the survey is summarized as follows: many of the local governments recognize the necessity of strategies for local community development, and at the same time, the necessity of the data-utilization for such strategy study or preparation.

(2) Premises and challenges for ICT-based local community development

The analysis on the activities of the local governments with regard to ICT-based local community development shows the following: while only 5.7% have such activities (have already started such activities or been in the process of preparation), local governments have high expectations for ICT-based community development, judging from the fact that about 70% responded favorably, and 65.9% replied that they are always paying attention on the issue; however, many of these local governments are still in the preliminary phase and are far away from the realization phase (Figure 1-5-1-4).

The analysis on the fields expected as the targets of ICT-based community development shows that many of the local governments think ICT should be introduced in such fields as "Security and Safety" (40.9%), "Health-care, Education and Daily life" (34.2%), and "Agriculture, Forestry, and Fisheries and Regional Industries" (29.8%) (Figure 1-5-1-5)

The analysis on the challenges of the ICT-based community development shows the following: while many of

the local governments point-out the budget constraints — “difficulty in budgeting” (49.9%), a certain number of the local governments point-out the challenge of “presenting the effects in a tangible way” such as “low understanding or participation by the residents due to the absence of objective case-data” (39.6%), “shortage of cases proving the effects” (30.8%); on the other hand, some local governments pointed out the importance of service accessibility such as “terminals or services friendly to seniors and juveniles are necessary” (34.0%).

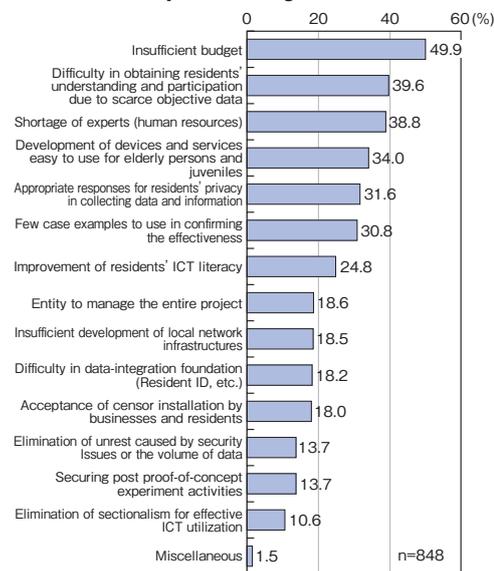
The analysis is summarized as follows: local governments, while still in their preliminary phases in data and ICT utilization for the preparation of local community management strategies and the concepts such as “smart city,” or “smart town,” generally agree on the necessity of ICT-based community development; therefore, rapid progress is expected if the budgetary constraints are removed, or if the tangible effects are presented through proof-of-concept experiments.

ICT-based local community development embodied in a concept such as the “smart city” has just been set on the way to proceed. For its wide adoption in Japan, it is important from now on to promote making its positive effects tangible through accumulating the concept-proving cases and taking the local governments’ into account.

(3) Activities in the Ministry of Internal Affairs and Communications

The Ministry of Internal Affairs and Communications, having since December 2011 held meetings of the “Panel for ICT-based Community Development and Globalization of ICT,” released a report in July 2012. With regard to the schedule, the report proposes that, in around 2015, a pioneering model for the “ICT Smart Town” be completed. At the same time, the report proposes, for the purpose of domestic and global deployment of the above-mentioned pioneering model, a comprehensive development policy including the following objectives for which the government should start activities urgently from FY 2012 toward 2020: promotion of regional proof-of-concept projects; architectural system-design for ICT-based community development; promotion of global proof-of-concept projects; research and development and standardization of the common technologies for ICT-based community development; promotion of ICT infrastructure development for building a new-type of community; and the establishment of the “ICT Smart town Promotion Conference.”

Figure 1-5-1-6 What are the challenges for community-development through ICT?



(Source) MIC “Research and Survey on the Current State of ICT Utilization and its Economic Effects in Local Community (2012)”