Chapter 1

Featured Topic: Progress of Ubiquitous Economy and Global Expansion

Section 1
ICT and Economic Growth

1. Economic growth in "the age of information and knowledge"

(1) Advent of "the age of information and knowledge"

Economic growth seen from a super long-term perspective has come through "the age of agriculture" and "the age of industry." In the early years of the 21st century, we are now expected to see the advent of "the age of information and knowledge."

Each age saw a major change that had worked as a source of new economic growth. It was fertile vast land in "the age of agriculture" and capital equipment in "the age of industry." In the coming "age of information and knowledge," ICT is expected to bring about change, and information and knowledge will become a source of new economic growth.

In the age of information and knowledge, ICT and networks will make their way into various fields, bringing active exchanges of information and knowledge and creating various innovations based on new ideas and creativity. And how to utilize such diverse information and knowledge will come to have important implications.

(2) Progress of ubiquitous networks and "the age of information and knowledge"

As of now, we have no objective macro-level indicators to show an overall picture of the progress of ubiquitous networks. We are only recognizing the progress from individual situations and various data. Therefore, in order to analyze the impact of the progress of ubiquitous networks on the society and economy, it is important to try to develop "ubiquitous index" to indicate the progress of ubiquitous networks objectively.

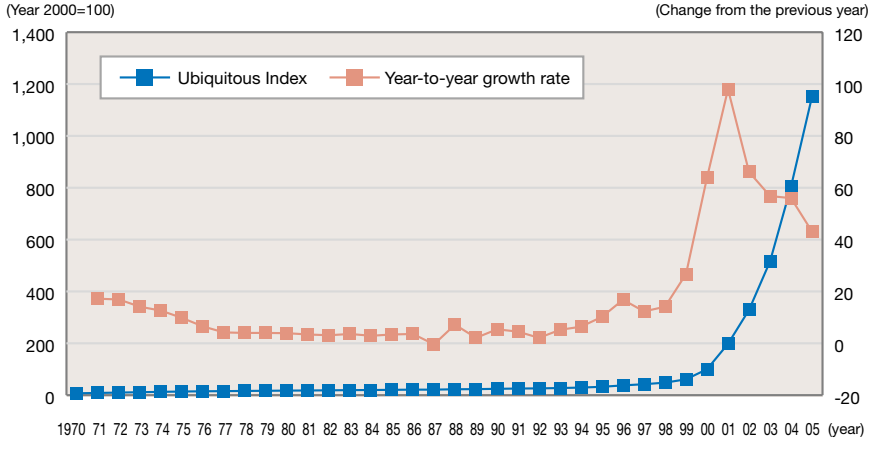
Below, we first develop ubiquitous index to show the progress of ubiquitous networks from the aspect of utilization and then analyze the impact of the progress of ubiquitous networks on economic growth, and lastly present the prospect for economic growth in 2010 that could be achieved if the potentials of ubiquitous networks were fully utilized.

(3) Development of ubiquitous index

Since the progress of ubiquitous networks causes major changes in their utilization, ubiquitous index needs to fully reflect the characteristics of ubiquitous network utilizations. For this reason, we used "expansion of spread" and "increased use" as two criteria to measure the progress of ubiquitous networks, selected data showing the two criteria, and, based on them, calculated "ubiquitous index" with the score as of 2000 being 100. Changes in calculated ubiquitous index show that ubiquitous networks have made rapid progress in Japan in the last several years **(Graph 1-1)**. The index began to rise sharply after 1995, when personal computers, the Internet and mobile phones began to spread in earnest. The year-to-year growth in the spread of ubiquitous networks hit a peak in 2001 buoyed by the global IT boom that began in the second half of the 1990s. Although the growth slackened slightly thereafter, it still remains at a high level.

Moreover, calculation of estimated ubiquitous index shows that year-to-year growth will begin to rise again after 2006. Ubiquitous networks made progress in the second half of the 1990s due to the "expansion of spread" and are expected to accelerate their progress toward 2010 on the strength of "increased use."

Graph 1-1 Changes in Ubiquitous Index



(Source) "Survey on Economic Growth by ICT"

(4) Progress of ubiquitous networks and economic growth

Next, in order to investigate the impact of the progress of ubiquitous networks, such as "expansion of spread" and "increased use," on economic growth based on the calculated ubiquitous index, they are analyzed by using macro production function model.

Estimate equation :

$$\ln\left(\frac{Y}{L}\right) = \ln A + \alpha' \cdot \ln\left(\frac{K_{all}}{L}\right) + \beta \cdot \ln(K_i \cdot U) + \delta Dummy$$

Estimated result :

$$\ln(Y/L) = \underset{(-18.430)}{-0.8511} + \underset{(19.450)}{0.4296} \cdot \ln(K_{all}/L) + \underset{(2.830)}{0.0105} \cdot \ln(Ki \cdot U) + \underset{(3.560)}{0.0409} Dummy$$

Determination coefficient = 0.9956;
Durbin-Watson ratio = 1.6874

** Figures in the parentheses are t values*

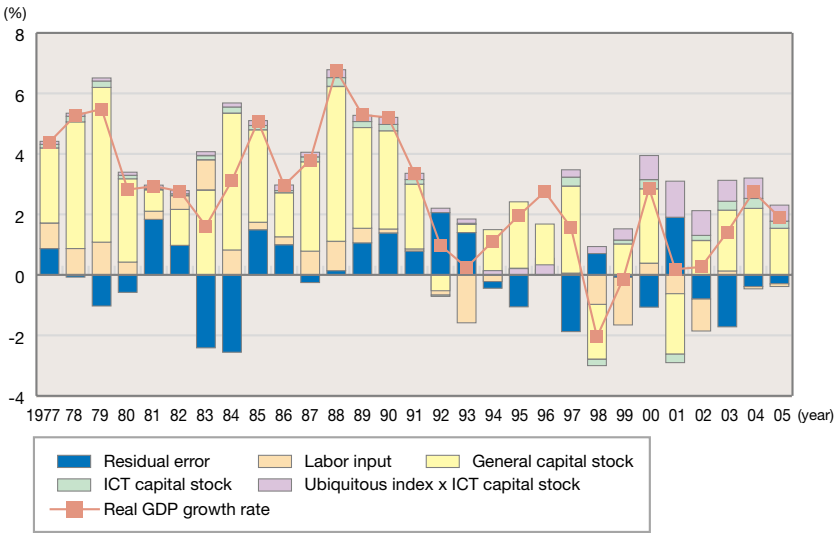
We can confirm from the estimated result that not only network economy by corporations' ICT capital but also ubiquitous networks are making positive contribution to the enhancement of productivity.

Furthermore, the estimated result shows that ubiquitous networks have been increasing their contribution to economic growth **(Graph 1-2)**.

(5) Development of ubiquitous networks and projected economic growth

A simulation of the contribution of the development of ICT capital and ubiquitous networks to economic growth shows that if the Japanese economy grows smoothly and the potentials of ubiquitous networks are fully utilized, Japan's real GDP growth rate will be about 1.0 to 1.1 points higher than in the case where such conditions are not met **(Graph 1-3)**.

Graph 1-2 Progress of Ubiquitous Networks and Their Contribution to Real GDP Growth



(Source) "Survey on Economic Growth by ICT"

Graph 1-3 Estimation of Contribution of Ubiquitous Effect to Real GDP Growth

* Case 1 is where the Japanese economy grows smoothly and the potentials of ubiquitous networks are fully utilized.

Case 2 is where the Japanese economy does not grow smoothly and the potentials of ubiquitous networks are not fully utilized.

(Source) "Survey on Economic Growth by ICT"

2. ICT investment and Economic Growth

(1) Increases in economic growth and labor productivity by ICT investment

A comparison of changes in ICT investment between Japan and the United States from 1990 to 2005 shows that while Japan's investment increased by about 1.9 times during the period, U.S. investment increased by about 6.2 times, more than 3 times faster than in Japan. During the same period, Japan's GDP increased 1.2 times, while U.S. GDP grew about 1.5 times **(Graph 1-4)**.

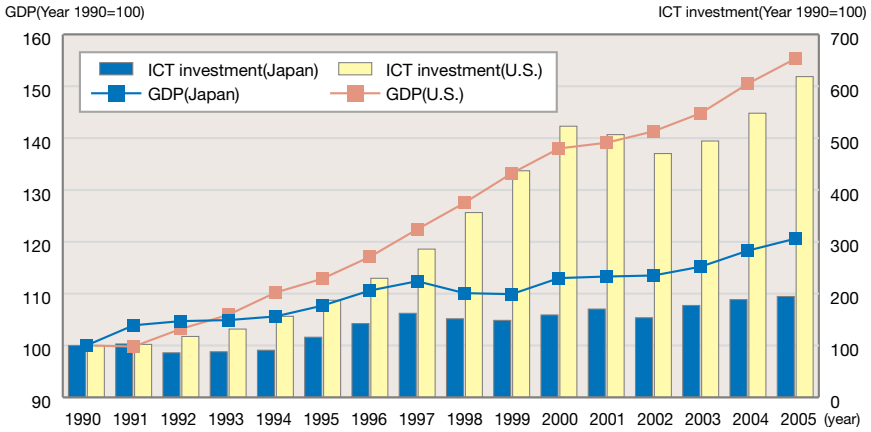
A comparison of the contribution of TFP to labor productivity between Japan and the United States **(Graph 1-5)** shows that U.S. labor productivity has consistently increased since 1990 and the contribution of TFP growth to labor productivity growth during the five years from 2000 to 2005 stands high at 2.20%. On the other hand, the growth rate of Japanese labor productivity has remained almost flat since 1990 and the contribution of TFP growth to labor productivity growth during the same five-year period stands at 1.00%.

The above results suggest that although Japan steadily increased ICT investment and accumulation of ICT capital, it lagged behind the United States in effectively utilizing them for innovation and that this may be the reason why Japan lagged behind the United States in enhancing its labor productivity.

(2) Factor analysis of increase in labor productivity

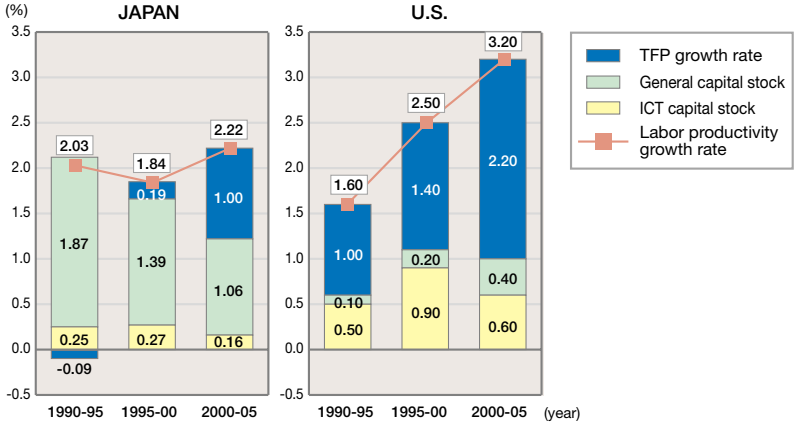
A comparison of the growth rate of labor productivity between the manufacturing industry and the service industry shows that the growth rate in the manufacturing industry in the past 10 years was 4.10%, while that in the service industry was 1.52% **(Graph 1-6)**. There is no big difference between the manufacturing industry and the service industry with regard to the contribution of ICT capital stock and general capital stock, respectively, to the growth rate. On the other hand, there is a big difference in the contribution of TFP to the growth rate between the two industries, with that to the manufacturing industry standing at 2.21% and that to the service industry at 0.14%. This is a major factor behind the contrasting result of labor productivity growth between the two industries.

Graph 1-4 Changes in ICT Investment and GDP in Japan and U.S.



(Source) "Survey on Economic Analysis of ICT"

Graph 1-5 Contribution of TFP Growth to Labor Productivity Growth



(Source) "Survey on Economic Analysis of ICT"

3. Status and Trends of the ICT Industry

(1) Status of the ICT industry as seen from the macro economy

A. Gross domestic product (GDP)

The real GDP of the ICT industry in 2005 increased 7.9% from the previous year to 66.8 trillion yen **(Graph 1-7)**. The real GDP of the ICT industry has been consistently increasing since 1995 and its average annual growth rate from 1995 to 2005 stood at 7.3%.

B. Contribution to the Japanese economy

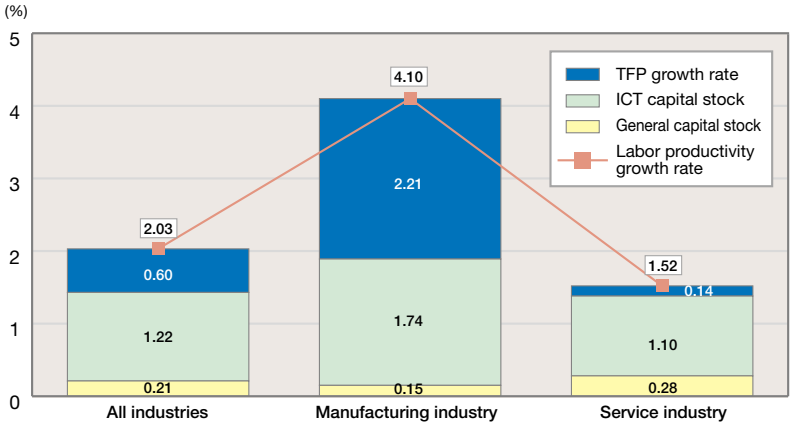
The ICT industry has been consistently making a positive contribution to the growth rate of Japan's real GDP since1996. In 2005, the industry had the largest impact on the nation's economic growth, contributing 0.9 percentage point to the 2.2% growth of the real GDP, or accounting for 42.2% of the growth **(Graph 1-8)**.

(2) Trends of the ICT industry

The ICT manufacturing industry has been maintaining a high level of production, shipment and inventory. Although the growth rates of production and shipment slowed down in the first half of 2005, they began to pick up again in early 2006. Inventory has been expanding further, showing a sign of buildup **(Graph 1-9)**.

The activities of the ICT service industry have remained on a moderate expansionary trend on the whole. In particular, contracts of system management and operation are brisk and software product and software businesses are on a rising trend. On the other hand, information-related machine and device leasing and mobile communications businesses, though they were on an increasing trend, are moving sideways in recent years **(Graph 1-10)**.

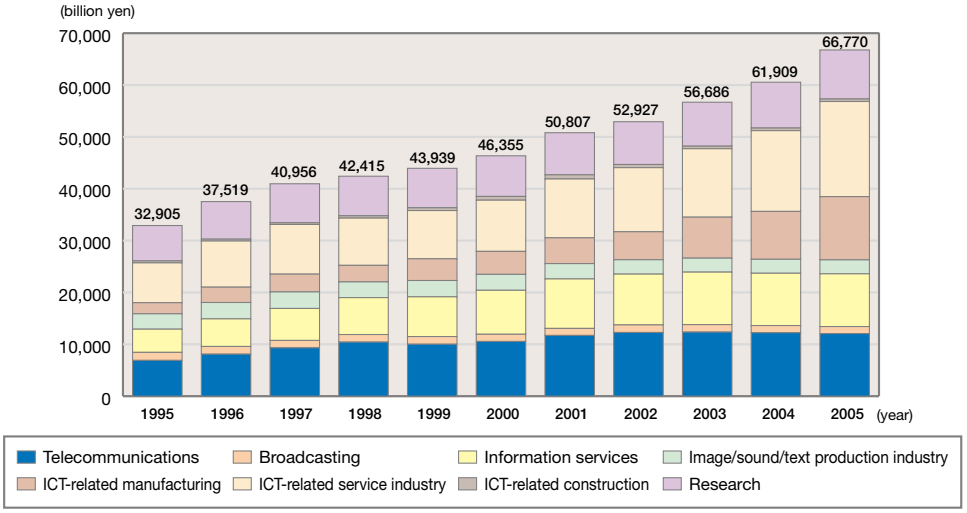
Graph 1-6 Contribution to Labor Productivity Growth (all industries, manufacturing industry, service industry)



* "Service industry" includes electric supply, gas supply, water supply and heat supply industries, commerce, financial and insurance businesses, and other service industries. "All industries" and "Service industry" do not include real estate industry.

(Source) "Survey on Economic Analysis of ICT"

Graph 1-7 Transition of Real GDP of ICT industry



(Source) "Survey on Economic Analysis of ICT"

4. Trends of the Japanese Economy as Seen from ICT-Related Demand (Consumption, Investment, Export)

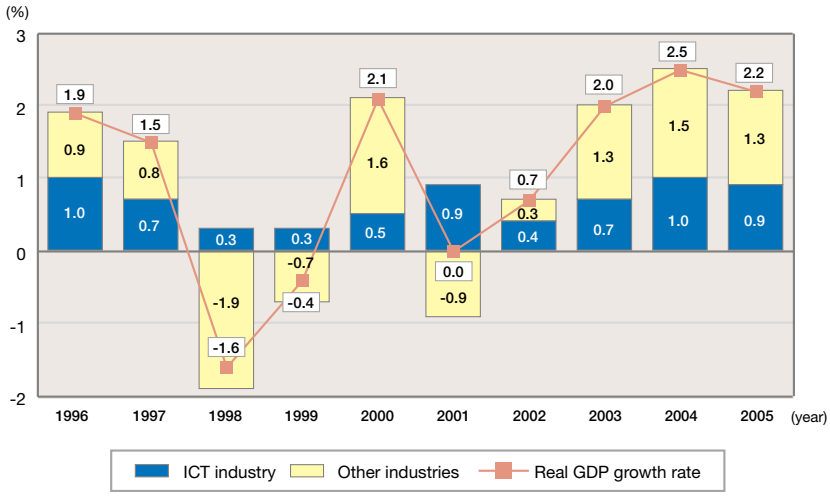
(1) Trends of the Japanese economy as seen from ICT-related domestic demand

ICT-related consumption's contribution to consumption expenditure shows that ICT-related consumption has been making a positive contribution in almost all quarters since 2001, indicating that ICT-related consumption has been contributing to the increase of total consumption expenditure **(Graph 1-11)**. As to the contribution of ICT-related investment to businesses' capital investment, machinery orders, which serve as a leading indicator for business investment, show that ICT-related machinery orders have been making a positive contribution to total machinery orders in almost all quarters from 2003 to the first half of 2006, indicating that ICT-related investment has been contributing to the increase of total investment since 2003 **(Graph 1-12)**

(2) Trends of the Japanese economy as seen from ICT-related external demand

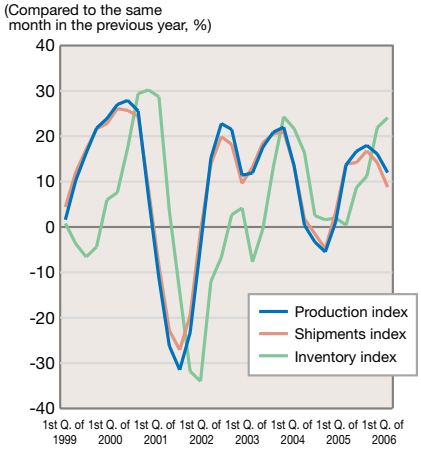
ICT-related exports show that while Japan's ICT-related exports to the United States have been on a decreasing trend since 2000, its ICT-related exports to China have been increasing sharply since 1999 **(Graph 1-13)**. Japan's ICT-related exports to other Asian countries are also increasing, albeit moderately.

Graph 1-8 Contribution of ICT industry to real GDP growth rate



(Source) "Survey on Economic Analysis of ICT"

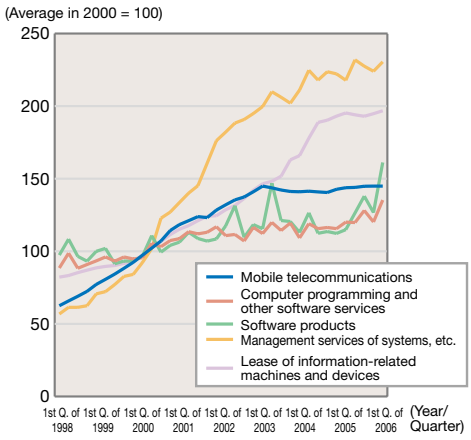
Graph 1-9 Production, shipments, and inventory status in the ICT manufacturing industry



* Calculating original indexes of production index, delivery index, and inventory index

Source: "Indices of Industrial Production," Ministry of Economy, Trade and Industry

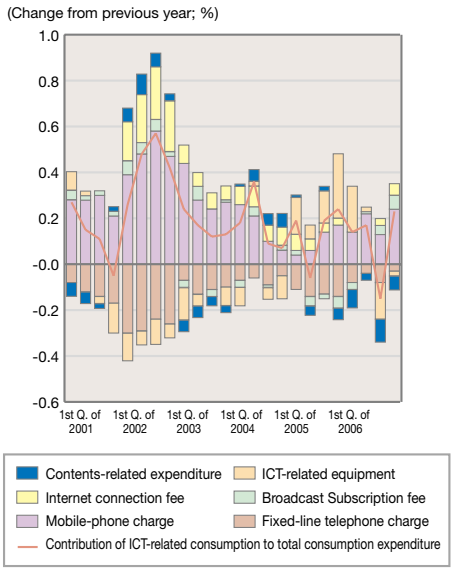
Graph 1-10 Activity status of the ICT service industry



Source: "Indices of Tertiary Industry Activity," Ministry of Economy, Trade and Industry

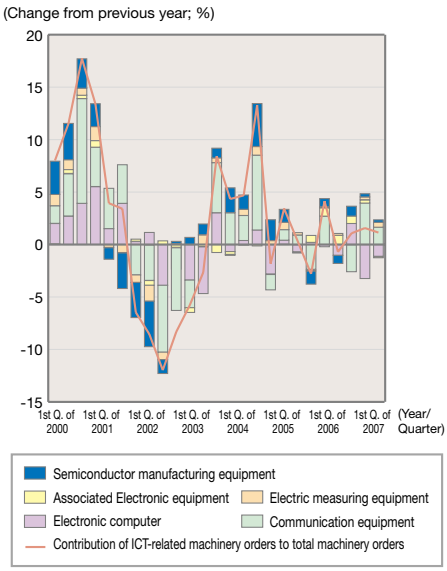
ICT-related exports to China show that Japan's exports of semiconductors and other electronic components, and intermediary goods for audio and visual equipment, have increased significantly **(Graph 1-14)**. This indicates that the trading structure of the Japanese ICT industry has been shifting to exports of semiconductors and other electronic components, intermediary goods for audio and visual equipment, from exports of final goods, such as electronic computers and communication equipment. As to Japan's trading partners, the United States had been the main partner, but in recent years, Asian countries, especially China, have become Japan's important export counterparts.

Graph 1-11 Contribution of ICT-Related Consumption to total Consumption Expenditure



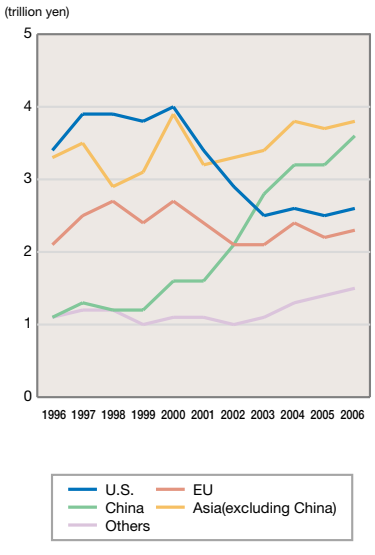
Source: "Family Income and Expenditure Survey," Ministry offf Internal Affairs and Communications

Graph 1-12 Contribution of ICT-Related Machinery Orders to Total Machinery Orders

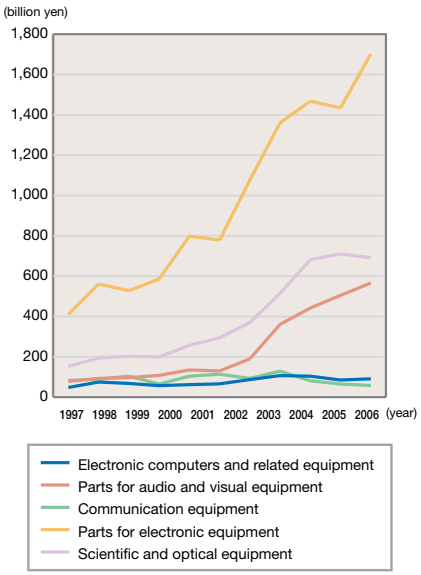


Source: "Orders Received for Machinery," Cabinet Office

Graph 1-13 Changes in ICT-Related Exports from Japan



Graph 1-14 Changes in ICT-Related Exports to China from Japan



Source for both graph 1-13 and 1-14, "Trade Statistics" Ministry of Finance

5. Economic Ripple Effects of the ICT Industry

(1) ICT industry's added-value induction effects

The added value induced by the ICT industry in 2005 increased 4.2% from the previous year to about 42 trillion yen. During the 10-year period from 1995 to 2005, the added value induced by many industries decreased or remained flat, but the added value induced by the ICT industry kept increasing except for 2002, indicating that the share of the ICT industry in the whole economy has increased **(Graph 1-15)**.

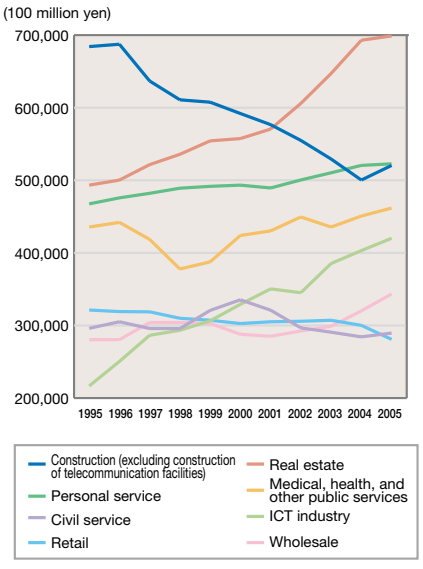
The number of jobs induced by the ICT industry during the same 10-year period remained almost unchanged. Furthermore, the number of jobs induced by each sector of the ICT industry shows that the number of jobs induced by the ICT-related manufacturing sector, which had accounted for the largest share, decreased sharply, indicating that this is a major factor behind the sluggish increase in the number of jobs induced by the ICT industry as a whole **(Graph 1-16)**.

6. Analysis of Regional ICT Industries

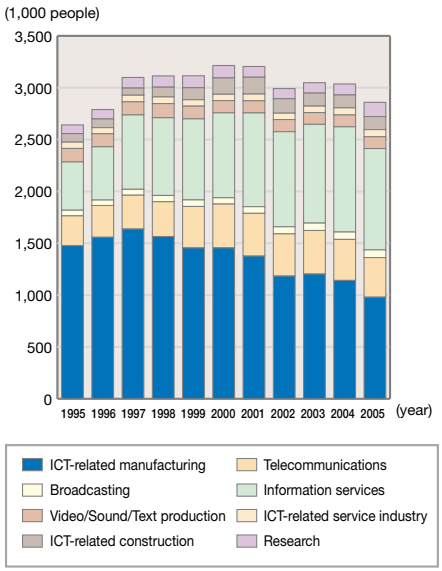
We have investigated the share of the regional real domestic output by the ICT-related manufacturing sector and ICT-related service sector in the national real domestic output by the same industries. With regard to the manufacturing sector, the study shows that although the share of the Kanto area was the largest both in 1990 and 2000, its share has been shrinking. On the other hand, the shares of the Chubu, Kyushu and Tohoku areas have increased, indicating that the manufacturing sector has been shifting production from Kanto to other areas. With regard to the service sector, the study shows that the share of Kanto area was the largest both in 1990 and 2000 and that the share has been increasing. On the other hand, the shares of other areas have decreased or remained flat, indicating that the accumulation of the service sector in the Kanto area has been increasing.

Furthermore, a study of the relationship between the ICT service sector in Kanto and the ICT-related manufacturing sector in 8 areas other than Kanto shows that the output of the ICT-related manufacturing sector in the 8 areas other than Kanto that was induced by final demand for the ICT service sector in Kanto increased consistently from 1990 to 2000. The growth rate of the output induced by such final demand had been 45.7% in 5 years from 1990 to 1995 and jumped 102.4% in the next 5 years from 1995 to 2000. The output of the ICT service sector in Kanto that was induced by final demand for the ICT manufacturing sector in the 8 areas other than Kanto also increased consistently from 1990 to 2000. The growth rate of the output induced by such final demand had been 1.5% in 5 years from 1990 to 1995 and surged 97.2% in the next 5 years from 1995 to 2000. This suggests that in the ICT industry, a large mechanism may be at work to bring about production inducement effects to the whole of Japan through inter-regional economic ripple effects. It can be said that the growth of the ICT industry in Japan is contributing to an integrated development of regional economies.

Graph 1-15 Changes in the Added Value Induced by Major Industries



Graph 1-16 Changes in the Number of Jobs of Each Sector Induced by ICT Industry



(Source for graphs 1-15 and 1-16) "Survey on Economic Growth by ICT"

Section 2
ICT and Competitiveness

1. International Competitiveness of ICT Industry

(1) Globalization of ICT networks

A. Trends concerning global business development by the world's major telecommunications carriers

The current state of the global business development by the world's major telecommunications carriers reveals that they are actively promoting global expansion by establishing local subsidiaries and through investment in local telecommunications carriers **(Graph1-17)**.

B. Efforts at home and abroad for the construction and diffusion of next-generation network

Efforts are being made for the construction of next-generation networks in such fields as NGN, wireless communications, digital broadcasting, and network convergence, with various countries participating. And in the field of NGN, standardizing bodies in Asia and Europe and United States are working on global standardization of NGN under ITU-T **(Graph 1-18)**. Development of mobile phone systems standardization following the 3G (third-generation) is in progress, and in terrestrial digital broadcasting, the three standards: of Japan, Europe and the United States have been adopted in the world.

C. Progress in offshoring through global networks

(a) Background of expanding offshoring

Due to the advancement of global networks and the

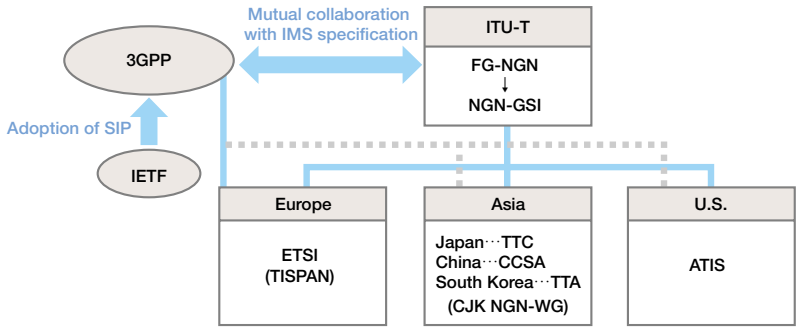
Graph 1-17 Status of Overseas Business Development by Major Telecom Carriers Abroad (As of the end of FY2006)

Country	Telecom carrier	Business		Country where business is being operated											
				Asia				America		Europe					
		Fixed communications	Mobile communications	Japan	China	South Korea	Others	U.S	Others	Germany	France	U.K.	Spain	Italy	Others
Japan	NTT	●	●	◎		△	△	○							
	KDDI	●	●	◎		△	△		○						△
	Softbank	●	●	◎											
Americas	AT&T Inc.	●	●	○	○	○	○	◎	○	○	○	○	○	○	○
	Verizon	●	●	○		○	○	◎	○	○	○	○	○	○	○
	Sprint Nextel		●	○		○	○	◎	○	○	○	○	○	○	○
France	FT	●	●								◎	○	○		○
U.K.	Vodafone		●		△		○	△		○	△	◎	○	○	○
	BT	●		○	○	○	○	○	○	○	○	◎	○	○	○
Spain	Telefonica	●	●		△				○	○		○	◎	△	○
South Korea	KT	●	●			◎	△								○

* "◎": Headquarters; "○": Local telecom subsidiary (Equity stake of more than 50%); "△": Partial investment in local telecom operator (equity stake of more than 1%)

(Source) Compiled based on interviews

Graph 1-18 System to Study the International Standardization of NGN



(Source) "Surveillance Study on the Current Status of Ubiquitous Network Society"

remarkable growth of software-service industries in China and India, the offshore development of software has been progressing rapidly. From the perspective of the development of international communication networks, large-capacity submarine cables have been laid around Japan, extending to China, Southeast Asian countries and even to the western part of India, lowering the charge per capacity **(Graph 1-19)**. Moreover, the size of software-service industries in China and India, the countries that are drawing attention as offshore partners have expanded from 9.7 billion dollars in 2001 to 60.2 billion dollars in 2006 and from 9.5 billion dollars to 37.4 billion dollars, respectively **(Graph 1-20)**.

(b) Outlook of Japan's offshore development and comparison of characteristics of offshore development between Japan and the U.S.

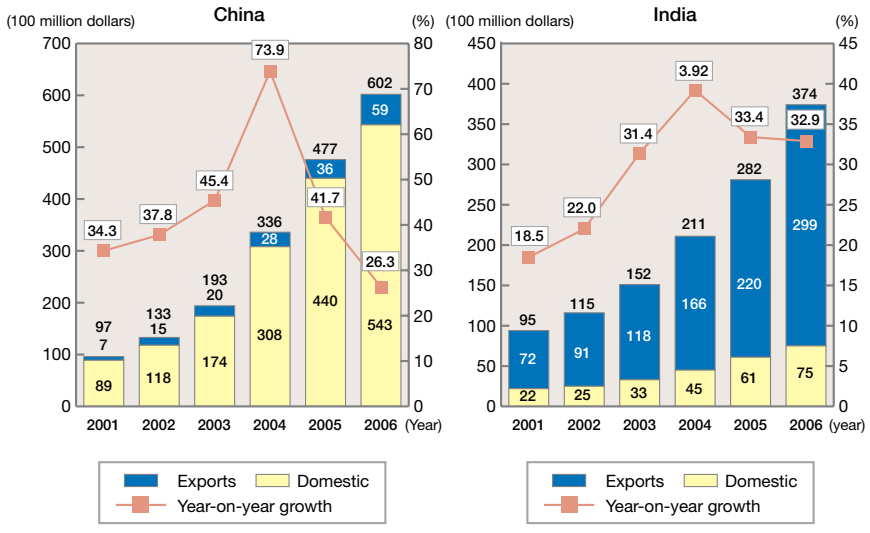
According to surveys, the size of Japan's offshore development, which stood at 63.6 billion yen in 2005, is expected to increase to about 200 billion yen in 2010 **(Graph 1-21)**. One of the major purposes of the advancement of offshore development is to complement the shortage of software engineers in Japan. Therefore, as long as increases in the size of software development continue to exceed increases in the size of offshore development, expanding offshore development will not result in decreasing domestic employment **(Graph 1-22)**.

A comparison of Japan and the United States with regard to the main offshoring destination countries, that of Japan is China (about 80%), and that of the United States is India (about 95%) **(Graph 1-23)**. As to the criteria for selecting companies to which they commission offshore development, Japan attaches importance to language and cost reduction, while the United States places emphasis on technical capabilities of engineers and their performance **(Graph 1-24)**.

Graph 1-19 International Undersea Cable Around Japan

(Source) KDDI

Graph 1-20 Changes in the Sales of Software-Service Industries in China and India



(Source for China) China Software Industry Association
(Source for India) Ministry of Communications & Information Technology

(2) Status of international competitiveness of Japanese ICT industry

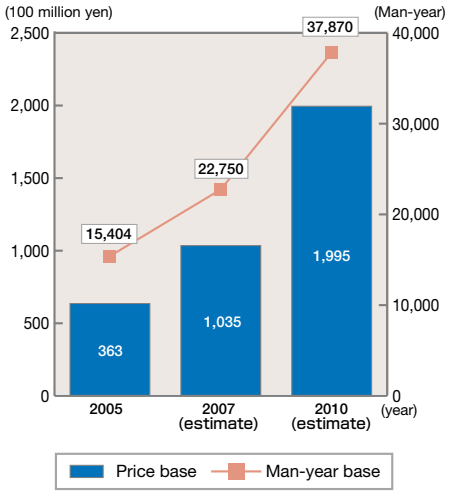
A. Profit rate of the world's ICT vendors

The average operating profit rate of major Japanese ICT vendors in the past 10 years is lower than those of their counterparts in the U.S., Europe and South Korea in all of the following fields: terminals and equipment, devices, and software solution. The gap is particularly wide in the fields of devices and software solution **(Graph 1-25)**.

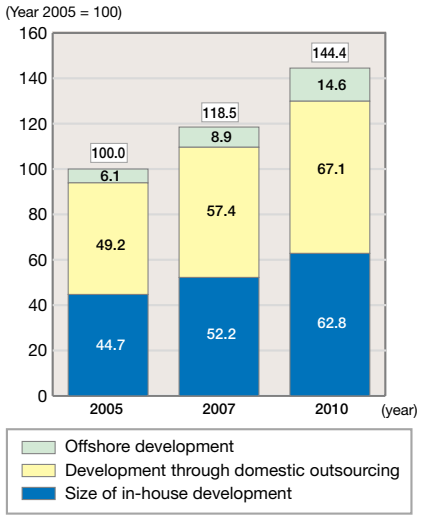
B. International comparison of the competitiveness of ICT industries

From 1997 to 2005, Japan saw its global market share and exports share decline in almost all products, indicating that Japanese business competitiveness and location competitiveness as a production base have eroded. On the other hand, the United States, though its location competitiveness declined, has maintained its business competitiveness, suggesting that the country has been shifting its production base to other countries.

Graph 1-21 Size of Japan's Offshore Development

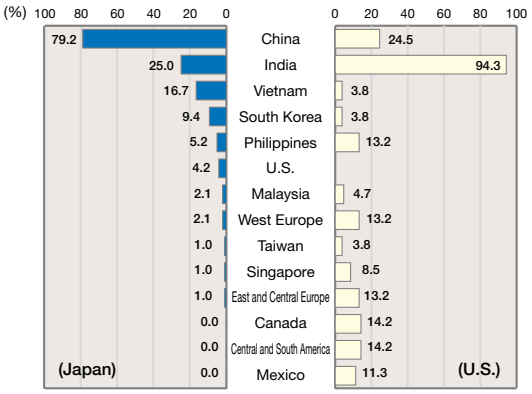


Graph 1-22 Size of Japan's Software Development by Type

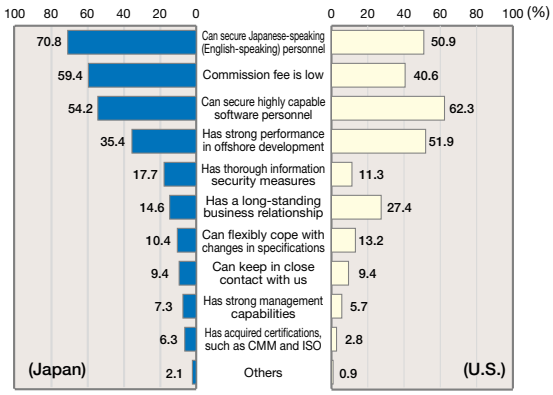


(Source for graphs 1-21 and 1-22) "Survey Research on the Advancement of Offshoring and its Impact"

Graph 1-23 Countries or Areas to Which Japan and U.S. Commission Offshore Development



Graph 1-24 Bases of Selection for Offshore Development



(Source for graphs 1-23 and 1-24) "Survey Research on the Advancement of Offshoring and its Impact"

Graph 1-25 Average Operating Profit Ratio of Major Information Vendors by Country

	Total	Business field		
		Terminal and machine	Device	Software / solution
Japan	4.1%	4.7%	2.5%	5.6%
U.S.	13.0%	7.2%	20.2%	19.6%
Europe	7.2%	7.1%	4.7%	13.0%
South Korea	12.3%	8.4%	22.9%	—

(Source) Compiled from vendors' financial statements

China, for its part, has rapidly increased its location competitiveness due to the foreign vendors' moves to concentrate their production bases by the development of the international division of labor **(Graph 1-26)**.

(3) International competitiveness of Japanese ICT industry as seen from competitive factors

A. Business development of Japanese vendors

In recent years, the weight of the Japanese market for communications-related equipment, such as personal computers and mobile phones, and digital video equipment, such as LCD TVs and plasma TVs, has been on a declining trend in the world **(Graph 1-27)**. Nevertheless, Japanese vendors are more domestic market-oriented than their counterparts in Europe and the United States **(Graph 1-28)**.

A comparison of the product structure of major vendors in various countries shows that Japanese vendors tend to deal in a wider range of products than their coun-

Graph 1-26 Changes in the Market Shares and Exports of Main ICT Machines and Devices Exports1997 (some in 1999)

Japan

year 1997(some in 1999)

World market share	Less than 15%	15~30%	More than 30%
More than 50%		Liquid crystal panel	DVD player Digital camera
25~50%	Cathode ray tube TV Mobile phone	Liquid crystal panel Laptop	
10~25%	Server	HDD	
Less than 10%	Desktop computer Router		

Export share

U.S

World market share	Less than 15%	15~30%	More than 30%
More than 50%		Server HDD	Router
25~50%	Laptop	Desktop computer Mobile phone Semiconductor	
10~25%			
Less than 10%	Cathode ray tube TV DVD player Digital camera	Liquid crystal panel	

Export share

China

World market share	Less than 15%	15~30%	More than 30%
More than 50%			
25~50%			
10~25%			
Less than 10%	Desktop computer / Laptop Server / Mobile phone Cathode ray tube TV / HDD DVD player / Router Digital camera / Semiconductor	Liquid crystal panel	

Export share

year 2005

World market share	Less than 15%	15~30%	More than 30%
More than 50%			Digital camera
25~50%	Laptop Cathode ray tube TV HDD		
10~25%	DVD player Semiconductor Liquid crystal panel Mobile phone		
Less than 10%	Desktop computer Server Router		

Export share

World market share	Less than 15%	15~30%	More than 30%
More than 50%	Server Router HDD		
25~50%	Desktop computer Laptop	Semiconductor	
10~25%	Mobile phone		
Less than 10%	Cathode ray tube TV DVD player Digital camera Liquid crystal panel		

Export share

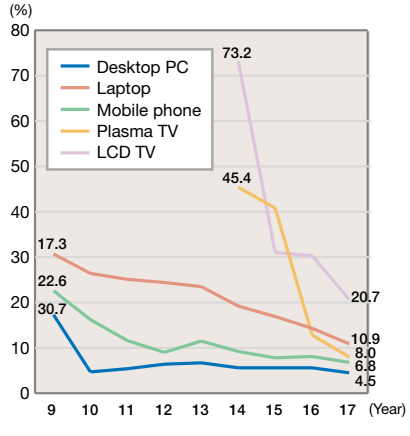
World market share	Less than 15%	15~30%	More than 30%
More than 50%			
25~50%		Cathode ray tube TV	DVD player
10~25%			Laptop
Less than 10%	Server	Mobile phone HDD Semiconductor	Desktop computer Router Digital camera Liquid crystal panel

Export share

* Export share is the ratio of each country's exports to total exports by the world's major countries.

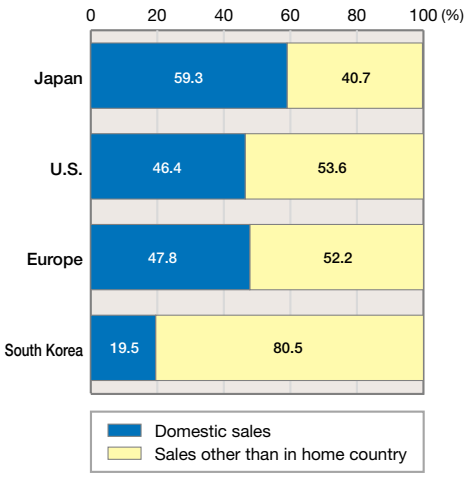
(Source) Compiled from research firms' materials

Graph 1-27 Weight of the Japanese Market in the World Market



(Source) Compiled from Fuji Chimera Research Institute materials

Graph 1-28 Domestic Sales Ratio of Japanese and Overseas Vendors



(Source) Compiled from vendors' financial statements

terparts in Europe and the United States **(Graph 1-29)**. While this tendency has advantages in that it makes diversification of risk and accumulation of a broad range of technology possible, it also has demerits in that it is difficult to seek economies of scale, as the size of each business division tends to be small, and that it drags on decision making due to the large adjustment costs involved.

B. Technical capabilities of Japanese vendors

A survey of Japanese professional engineers concerning technical capabilities shows that Japanese or U.S. technical capabilities have received high marks in almost all products **(Graph 1-30)**. The survey also shows that Japanese vendors have a technological edge in products requiring material technology, optical/electronic device technology, equipment technology and metal dies technology, and that American vendors have advantages in system configuration technology and communication technology **(Graph 1-31)**. In addition, Japanese vendors are good at producing products which have many important elemental technologies to conbine.

Graph 1-29 Status of Main ICT-Related Business Operations by Major ICT Vendors (As of the end of FY2006)

Company \ Product		Communications-related equipment						Visual equipment						Device				Software/Solution	
		Desktop PC	Laptop	Server	Router	Switch	Mobile phone	Cathode ray tube TV	Liquid crystal TV	Plasma TV	DVD player/recorder	Digital camera	Printer	Copier/complex machine	HDD	Semiconductor	Liquid crystal panel	Plasma panel	package System	architecture
Japan	Hitachi	○	○	○	○	○	○	○	○	○	○	○			○	○	○	○	○	○
	Matsushita		○		○		○	○	○	○	○	○	○	○		○	○	○	○	○
	Sony	○	○	○			△	○	○		○	○	○			○	△			○
	Toshiba	○	○	○	○	○	○		○		○	○	○	○	○	○	○		○	○
	NEC	○	○	○	○	○	○						○	○		○	○	○	○	○
	Fujitsu	○	○	○	○	○	○		△	△			○		○	○		△	○	○
	Canon											○	○	○					○	○
	Mitsubishi Electric	○	○	○		○	○	○	○		○		○			○	○		○	○
	Sharp	○	○				○	○	○		○		○	○		○	○		○	○
	Sanyo Electric						○	○	○	○	○	○				○				
	Ricoh											○	○	○		○			○	○
	Seiko Epson	○	○	○					○			○	○	○		○	○		○	○
	Kyocera						○						○	○			○		○	○
U.S.	IBM			○									△			○			○	○
	Hewlett Packard	○	○	○	○	○			○	○		○	○	○					○	○
	Dell	○	○	○		○			○				○							○
	Microsoft																		○	
	Intel															○				
	Motorola			○	○		○												○	○
	Cisco Systems			○	○	○													○	○
	EDS																			○
	Xerox												○	○		○			○	○
	CSC																		○	○
	Oracle																		○	○
	Kodak											○	○							
	Apple	○	○	○			○												○	△
	Texas Instruments															○				
	San Microsystems	○	○	○		○													○	○
	EMC																		○	○
	Seagate Technology														○					
Europe	Siemens (Germany)	△	△	△		○			△										△	○
	Alcatel-Lucent (France)				○	○	○												○	○
	Ericsson (Sweden)			○	○	○	○												○	○
	Nokia (Finland)						○												○	
	Philips (Netherlands)						△		○	○	○					△	△			
	Infineon (Germany)															○				
	ST Microelectronics (Italy, France)															○				
	SAP (Germany)																		○	○
	Capgemini (Germany)																			○
South Korea	Samsung Electronics	○	○	○			○	○	○	○	○		○	○	○	○	○	○		
	LG Electronics	○	○				○	○	○	○	○						△	○	△	△

* "○"designates business operations through a consolidated company. "△"designates business operations through a non-consolidated company.

* System architecture includes only those that require additional charges separate from hardware, software and their incidental services.

(Source) Compiled based on interviews

C. R&D and human resources in the ICT field

A comparison of the ratio of R&D spending to sales at major ICT vendors in Japan and other countries show that the R&D spending ratio of Japan is lower than that of the U.S. and European countries **(Graph 1-32)**. That of South Korea has been drastically increasing in recent years and almost the same level as that of Japan in FY2005. Moreover, the number of Japanese college graduates majoring in ICT-related subjects has remained flat in recent years, while the number of graduates majoring in similar subjects is on the increase in the United States, China and India, resulting in Japan falling behind other countries in terms of human resources as well **(Graph 1-33)**.

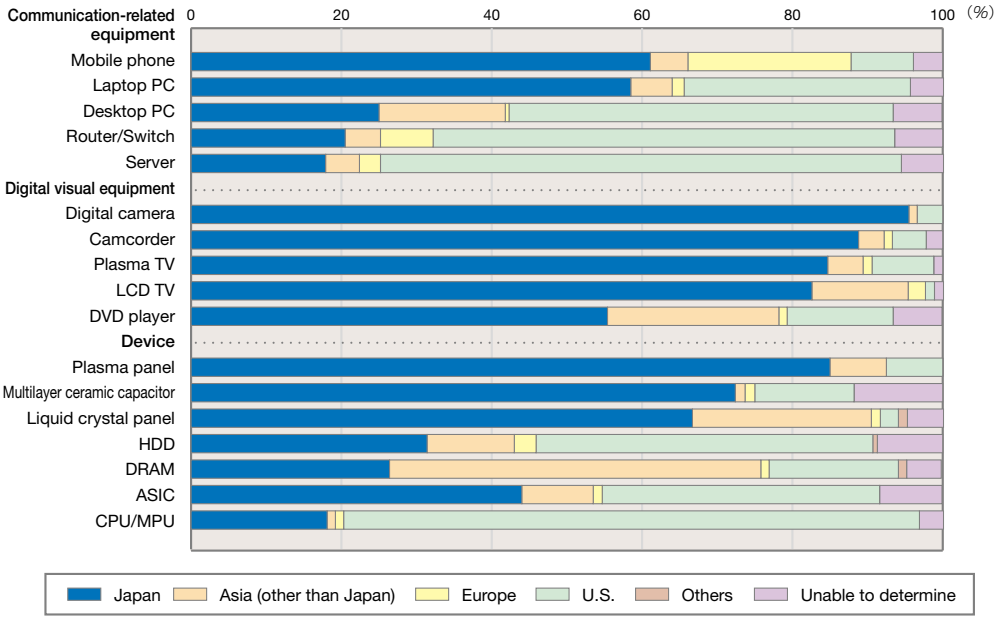
(4) Status of international competitiveness in each product

A. Network equipment (router/switch)

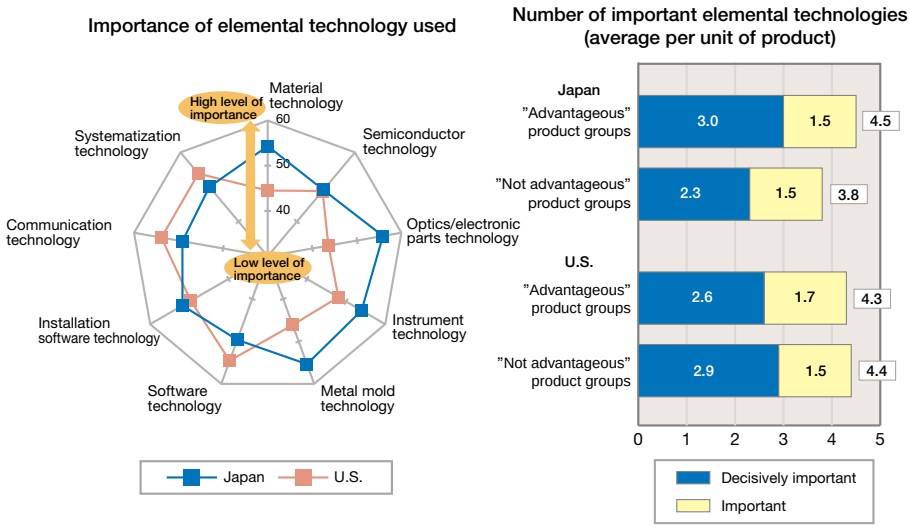
Among the network equipments that are expected to play an essential role in the establishment of next-generation networks are routers and switches. However, Japanese vendors' share of the world market for the two equipments is extremely small, with a dominant share held by North America. **(Graph 1-34 and 1-35)**.

In the future, the the demand for high-end products

Graph 1-30 Technological Capability of Each Country to Produce Main ICT-Related Products (areas of strongest advantage)

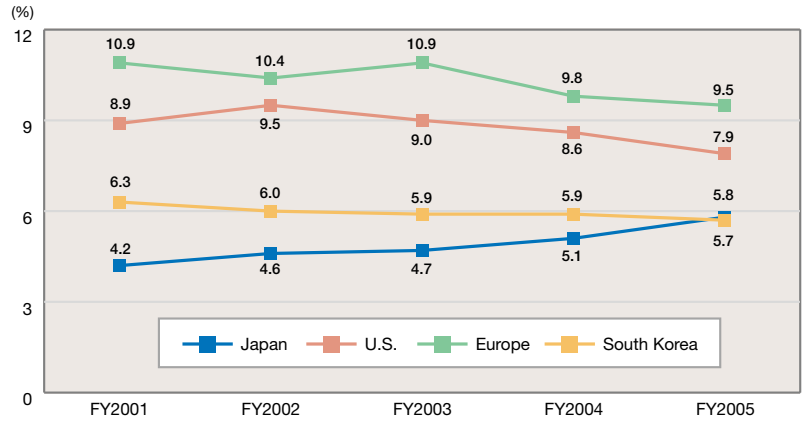


Graph 1-31 Comparison of Technical Features of Product Groups in which Japanese, U.S. or European Countries Have Technical Capabilities



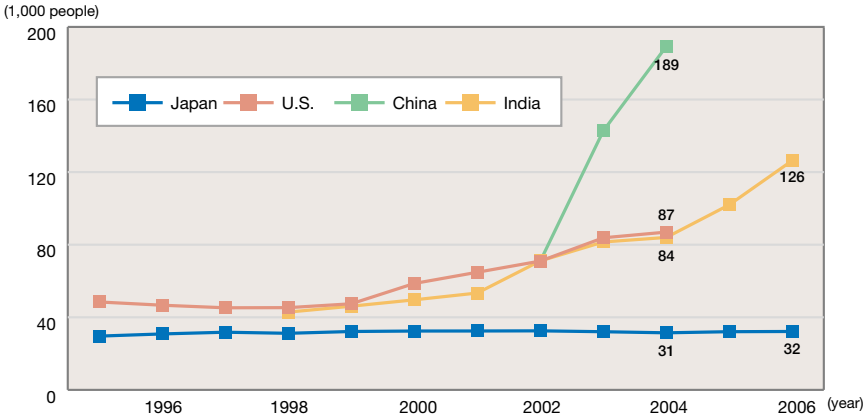
(Source for graphs 1-30 and 1-31) "Survey Research Concerning Elemental Technology in Major Japanese Products/Parts in the ICT Field"

Graph 1-32 Average Ratio of R&D Spending to Sales at Major ICT Vendors in Japan and Other Countries



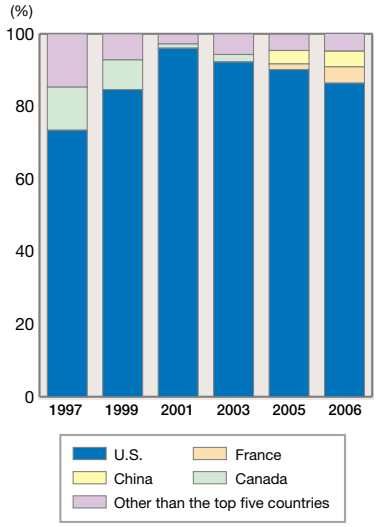
(Source) Compiled from companies' annual reports

Graph 1-33 Number of Graduates Majoring in ICT-Related Subjects by Country

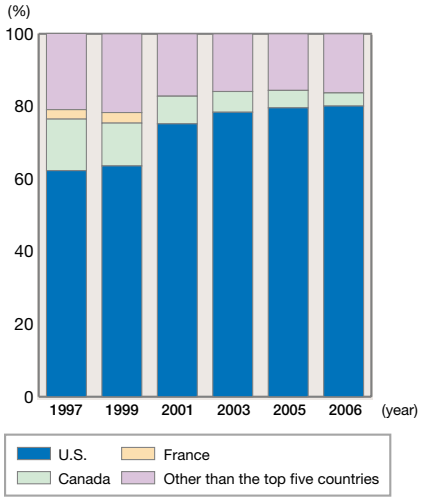


(Source)
Japan: Basic Survey on School (Ministry of Education, Culture, Sports, Science and Technology)
U.S.; Digest of Education Statistics (U.S. Department of Education)
China: China Software Development Research Report, 2003, 2004, 2005
India: Strategic Review 2002, 2003, 2004, 2007 (NASSCOM)

Graph 1-34 Changes in the Country-by-Country Share of the World Market for Routers (in shipment value)



Graph 1-35 Changes in the Country-by-Country Share of the World Market for Switches (in shipment value)



* Graphs 1-34 and 1-35 show country-by-country total of the shares of top five vendors.

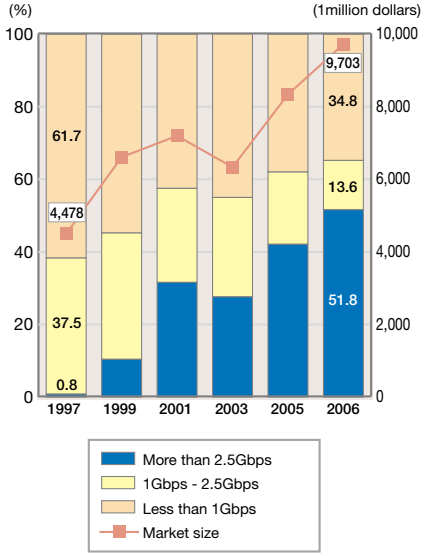
of broadband network is expected to expand the demand for high-end products for high-speed and large-capacity broadband. Therefore, Japan, which has realized the world's most advanced country in terms of broadband infrastructure, is expected to become a testbed for state-of-the-art products. It is likely to provide a significant opportunity for Japanese vendors to lead the diffusion and development of leading-edge network equipments in the world market **(Graph 1-36, Graph 1-37)**.

B. Mobile handset

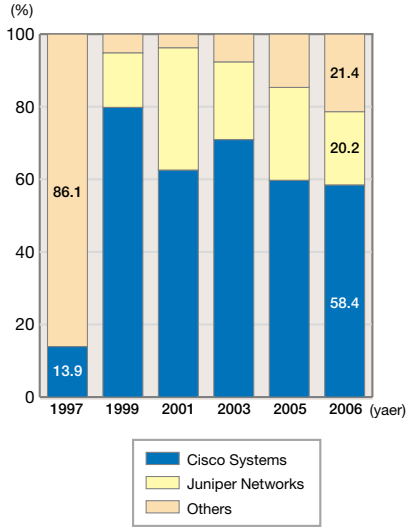
In the global market of mobile handset, key terminals in a ubiquitous network society, shows that Finland, to which Nokia belongs, tops the list. South Korea has increased its share in recent years. On the other hand, Japanese vendors' share has been decreasing **(Graph 1-38)**. With the center of the mobile handset market growth shifting from advanced countries to developing countries, the world mobile handset market has been expanding faster than the Japanese market **(Graph 1-39)**.

As to market size by communication system, the mobile handsets that utilize GSM, a communication system originally developed in Europe, accounted for more

Graph 1-36 Changes in the Capacity-by-Capacity Composition Ratio and Market Size of Routers in the World

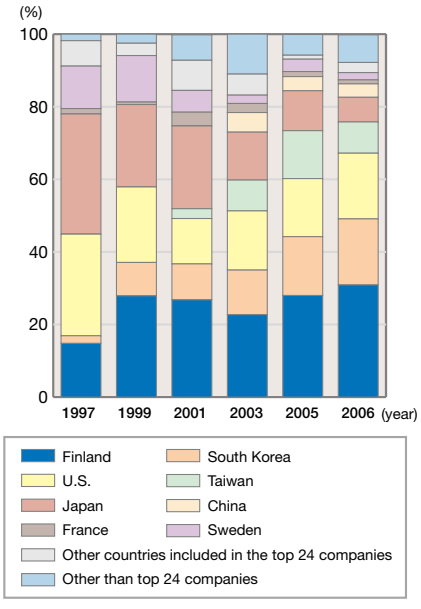


Graph 1-37 Changes in the Share of Routers of More Than 2.5 Gbps in the World Market



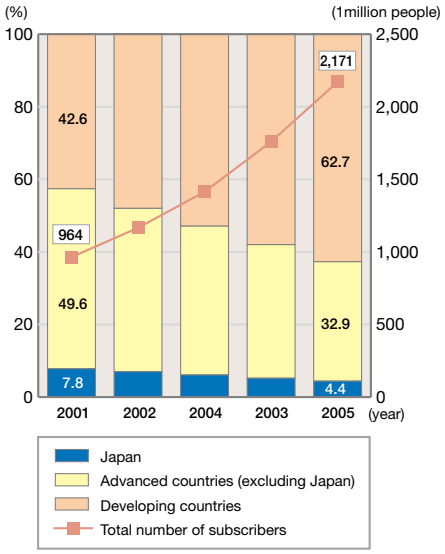
(Source for Graphs 1-34~37) Compiled from Dell' Oro Group materials

Graph 1-38 Changes in the Country-by-Country Share of the World Mobile-Phone Market (production base)



(Source) Compiled from Fuji Chimera Research Institute materials

Graph 1-39 Changes in the Number of Subscribers to Mobile Phones and their Ratio in the World



(Source) UNCTAD, "INFORMATION ECONOMY REPORT 2006"

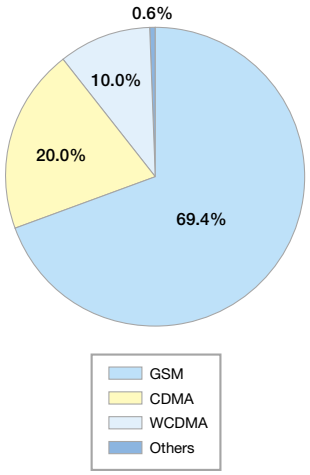
than two-thirds of the world market in 2006 **(Graph 1-40)**. Japanese vendors, who fell far behind others in the world market share of second-generation mobile phones, are competitive in the global market of the W-CDMA kept for third-generation mobile phones and have a certain market share **(Graph 1-41)**. It is important for them to promote global business development strategically by taking advantage of their strong competitiveness.

C. Flat-screen TVs/Flat Panel Display

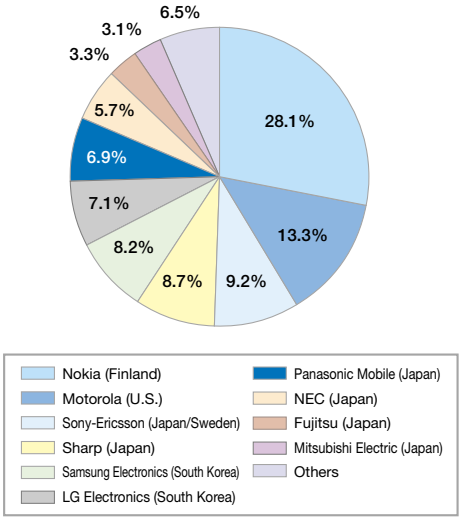
By the progress in technological innovation, such as liquid crystals and plasma, television as a key digital video equipment has been making a major shift from CRT-TV to flat-screen TV **(Graph 1-42)**. In particular, the market of LCD-TV has been expanding rapidly, with LCD-TV accounting for nearly half of the TV market on a shipment value basis. Meanwhile, South Korean and Taiwanese vendors have emerged as major players in the LCD-TV market and Japanese vendors' share has been declining **(Graph 1-43)**.

Since prices of flat panels have been declining rapidly, it is necessary to seek economies of scale by making

Graph 1-40 Percentage of Communication Methods Utilized in Mobile Phones in the World (production base, in 2006)

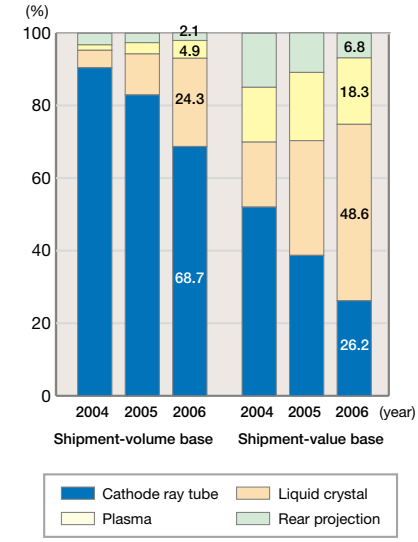


Graph 1-41 Share of W-CDMA Terminals in the World Market (production base; in 2006)

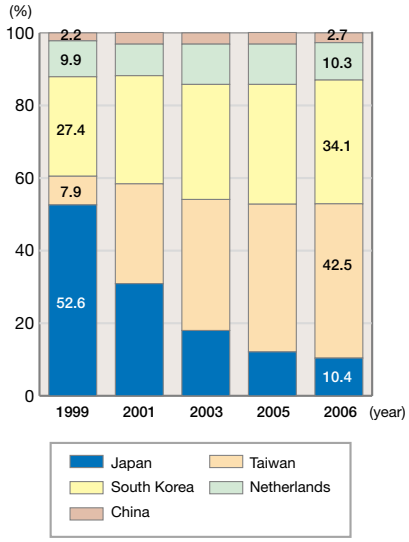


(Source for Graph 1-40 and 1-41) Compiled from Fuji Chimera Research Institute materials

Graph 1-42 Changes in the Type-by-Type Share of TVs in the World Market



Graph 1-43 Changes in the Country-by-Country Share (Shipment-Value Base) of Liquid Crystal Panels (10-inch or larger) in the World Market



(Source for Graph 1-42 and 1-43) Compiled from DisplaySearch materials

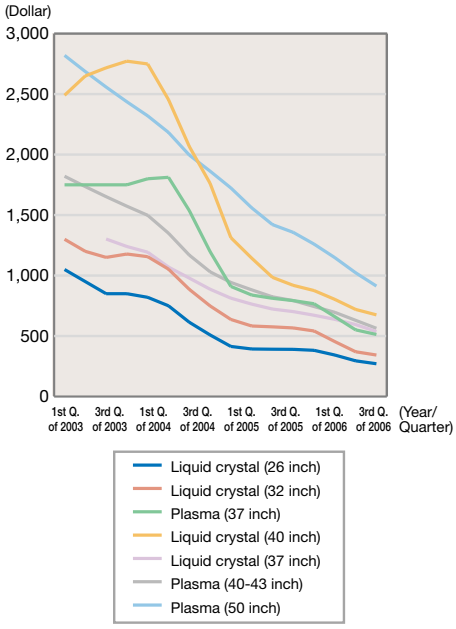
a large investment in a short cycle **(Graph 1-44)**. Furthermore, in order to cope with rapid technological innovations, promoting collaboration with material manufactures with international competitiveness may be one of the future options **(Graph 1-45)**.

D. Semiconductor

A semiconductor is an important component that defines the performance of various ICT equipment. While semiconductor shipment volume in the global market has been expanding drastically, Japan's share in the world has been declining consistently, and instead, South Korea has been increasing its share **(Graph 1-46)**.

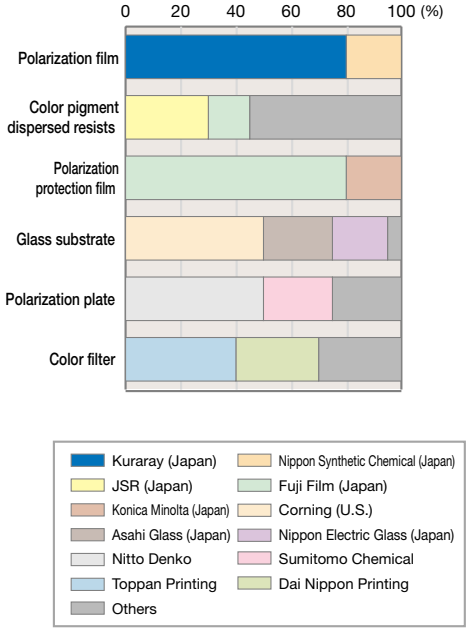
As to memory, Japan held a dominant share in the 1980s but it lagged behind some countries in terms of low-cost production such as a high yield rate and fine-processing technology, and large-scale investment capability. In the DRAM market, South Korea vendors hold a market share of more than 40% **(Graph 1-47)**. The market of system LSIs is expected to shift from those for specific products to those for unspecified products, such as digital consumer electronics. Therefore, one of the

Graph 1-44 Changes in the Price of Flat Panel for TV (price per sheet)



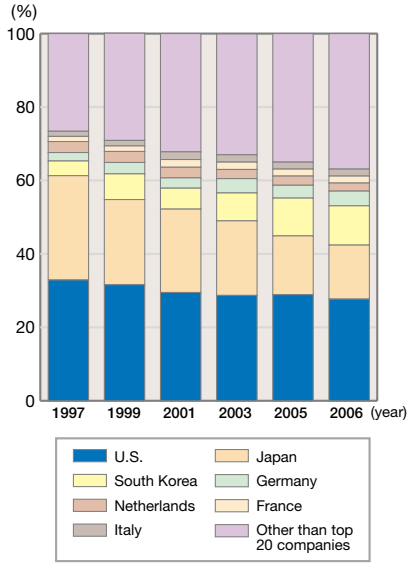
(Source) Compiled from DisplaySearch materials

Graph 1-45 World Market Share of Liquid Crystal Panel Components (in 2005)



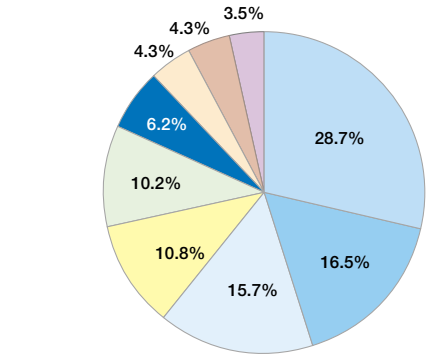
(Source) Nihon Keizai Shimbun, April 4, 2007 edition

Graph 1-46 Country-by-Country Share of the World Semiconductor Market (sales base)



* Total of country-by-country share of top 20 vendors

Graph 1-47 Share of World DRAM Market (sales base; in 2006)



(Source for Graph 1-46 and 1-47) Compiled form Gartner Dataquest

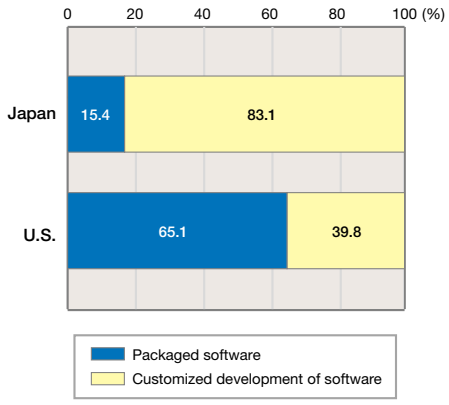
challenges of major Japanese semiconductor vendors with home appliances with a certain advantage in that they can produce system LSIs for their own use is how to standardize them for unspecified products.

E. Software

In the Japanese software industry, the percentage of packaged software is low and as a result Japanese vendors' world market share of software products is low, although they have a slightly high share in the system development/integration market **(Graph 1-48 and 1-49)**. Since Japanese vendors are mainly engaged in custom software, they cannot expect the merit of mass production, unlike in the case of packaged software, and their labor productivity is low.

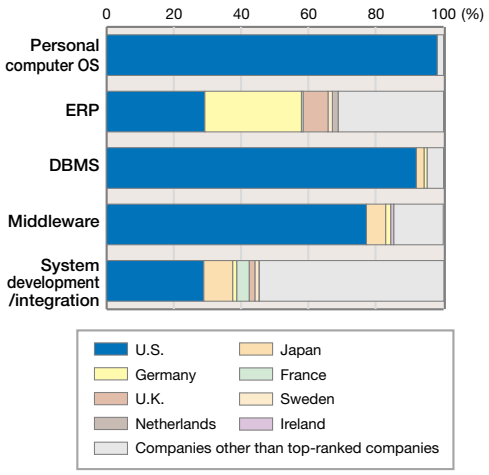
The progress in ubiquitous networks has produced new movements: diffusion of open source software (OSS) and software as a service (SaaS) **(Graph 1-50)**. They are likely to have a major impact on the business model of the conventional software industry in that OSS leads to a sharp price decline and SaaS targets small and mid-sized corporate customers who have been way behind in introducing software.

Graph 1-48 Difference in Category-by-Category Composition Ratio between Japanese and U.S. Software Industries



(Source) Japan: "FY2005 Survey on Specific Service Industries," Ministry of Economy, Trade and Industry
U.S.: "Service Annual Survey," Census Bureau, U.S. Department of Commerce

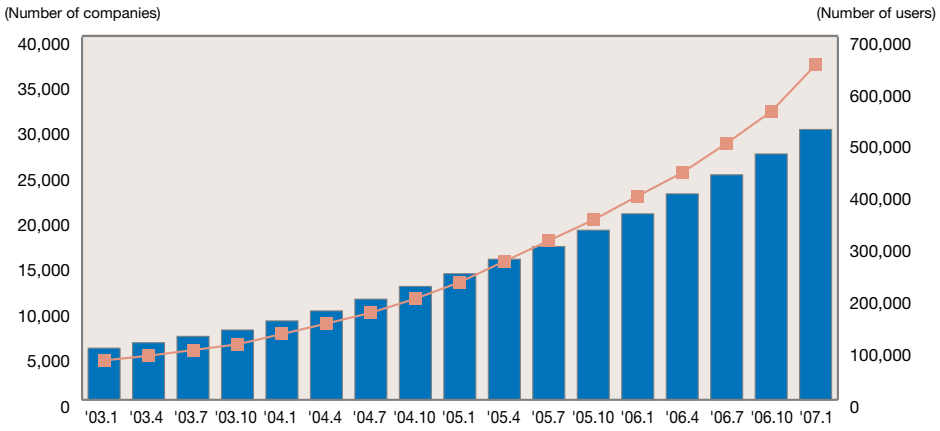
Graph 1-49 Country-by-Country Share of World Market of Various Software (2005)



* Total of country-by-country share of the companies making top 2 in personal computer OS, Top 13 in DBMS, and top 20 in other software

(Source) Compiled from Gartner Dataquest

Graph 1-50 Number of Companies and People Using Salesforce



* Salesforce is a vendor that provides customer management system through SaaS.

(Source) Salesforce.com

F. Contents

The size of the Japanese content distribution market was 11.3 trillion yen in 2005, with broadcasting contents accounting for about 70% of the image contents. Japanese broadcasters have developed their global business and Japanese broadcasting contents have been broadcast overseas **(Graph 1-51 and 1-52)**.

In some countries, the governments have been implementing measures to promote the overseas deployment of broadcasting contents. It is necessary for Japan to further strengthen its competitiveness by developing new markets and broadcasting channels overseas.

(5) Status of Japanese ICT Ventures

The number of listed Japanese ICT ventures has increased steadily **(Graph 1-53)**. A comparison of venture capital investment, which is essential for the growth of ventures, in Japan and the United States shows that the annual venture capital investment in Japan is extremely small compared with U.S. venture capital investment, and that the ratio of Japanese venture capital annual investment to GDP is one-fifth to one-sixth that of the United States **(Graph 1-54)**.

*Of the companies classified into the ICT industry and those whose core businesses do not exist without the Internet, the ICT venturs here refer to 185 firms established in or after 1994 and listed on the TSE first section, TSE second section, Mothers, Hercules, or JASDAQ in or after 1999.

The main customers of Japanese ICT ventures are ICT companies, suggesting that their growth depends largely on the existing ICT companies **(Graph 1-55)**. In recent years, the number of Japanese ICT ventures operating abroad has increased and the number of companies affiliated with Japanese ICT ventures has increased mainly in Asia **(Graph 1-56)**.

Graph 1-51 Examples of NHK's Overseas Deployment

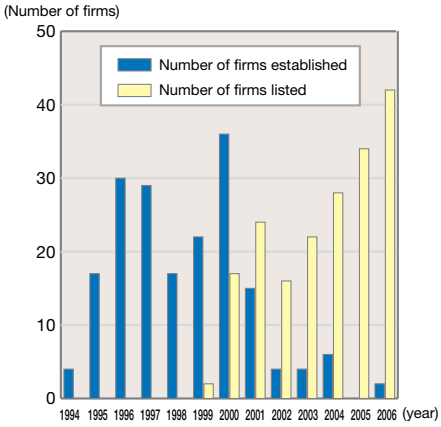
≪Exchanges of programs and news≫
Providing news (9 countries, 9 broadcasting organizations, 146 cases, total of 24 hours and 20 minutes)
"NHK Special" (5 countries, 5 broadcasting organizations, 8 cases, total of 7 hours and 52 minutes)
≪Grants≫
Provision through Foreign Ministry1s grants for cultural programs (4 countries, 1,341 programs)
(Bhutan, Dominica, Swaziland, Niger)
Provision through the Japan Foundation (36 countries, 1,118 programs)
(Asia, Central and Latin America, Africa, East Europe, etc.)
≪Sale of broadcasting rights≫
Provision of a total of 728 titles, 6,053 programs per year to broadcasting organizations in 39 countries or areas.

Graph 1-52 Examples of Private Broadcasters' Overseas Deployment

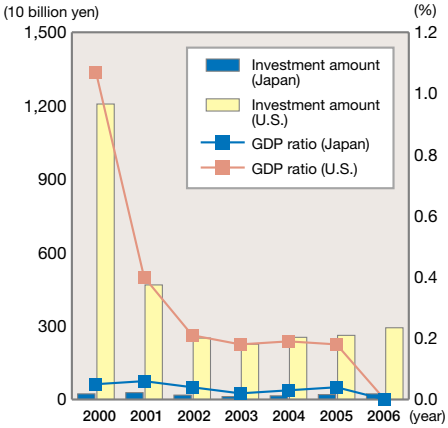
Broadcasters, led by key stations, are promoting exports of broadcasting contents. Estimated total revenue is slightly more than 5 billion yen.
In Taiwan, three channels specializing in Japan programs opened. Each channel purchases major programs in main genres from Japanese key station.
In Spain, local channels in 8 regions are broadcasting Japanese animation programs after dubbing them in their respective language (dialect) (some of them on a daily basis).
Exporting 58 programs (21 of them: animations). Overseas sales increased 4-fold in 4 years.
Sales of full-program slot packages to Asian countries, such as Taiwan, Hong Kong and Singapore.
Format sales to France. Broadcasted by France TFT. Market share at 34.7% (highest among the programs in the same time slot)

(Source for Graph 1-51 and 1-52) "Final report on discussions by the ICT International Competitiveness Council")

Graph 1-53 Changes in the Numbers of Japanese ICT Venture Firms Established and Listed



Graph 1-54 Ratio of Venture Capitals' Annual Investment to GDP in Japan and U.S.



(Source for Graph 1-53 and 1-54) "Survey Research on the Actual State and Growth of ICT Venture Firms"

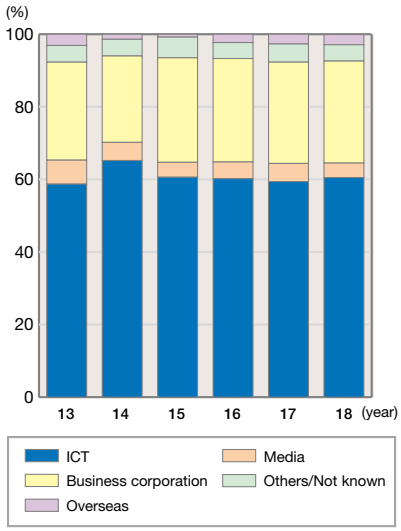
2. Corporate Competitiveness through Use ICT

(1) Effects of corporations' ICT use and business process/organization restructuring

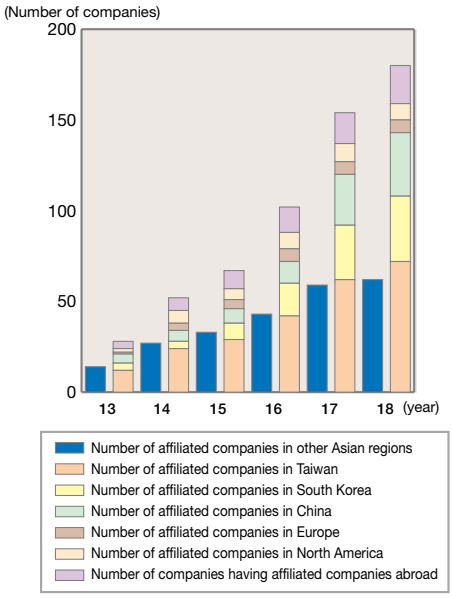
A study on ICT system introduction and accompanying business process/organization restructuring shows that the introduction of ICT systems will have its maximum effect if it is implemented along with business process/organization restructuring **(Graph 1-57)**.

A comparison of ICT system introduction and business process/organization restructuring by corporate size shows that the larger a corporation is, the higher the level of business process/organization restructuring is **(Graph 1-58)**. It also shows that small and mid-sized corporations are slow in introducing ICT systems.

Graph 1-55 Changes in the Main Customers of Japanese ICT Venture Firms

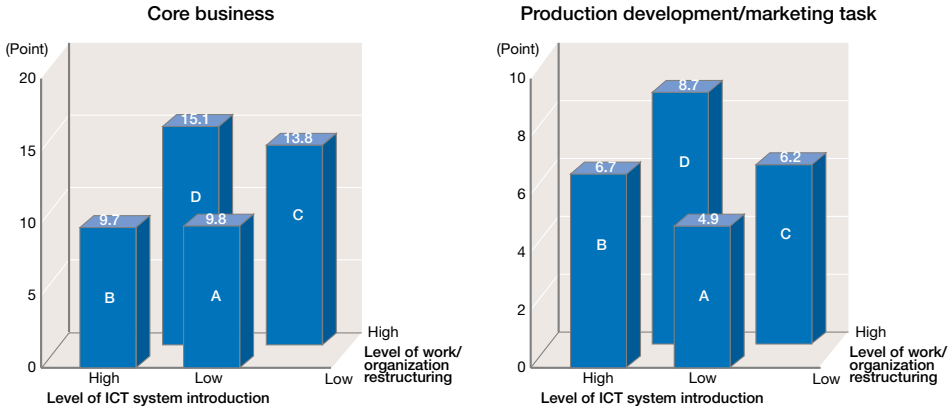


Graph 1-56 Changes in the Number of ICT Venture Firms Having Affiliated Companies Abroad and the Number of Japanese ICT Venture Firm-Affiliated Companies Abroad



(Source for Graph 1-55 and 1-56) "Survey Research on the Actual State and Growth of ICT Venture Firms"

Graph 1-57 Relationship between the Level of ICT System Introduction and Work/Organization Restructuring and the Level of Implementation Effects



A group:
Low level of restructuring x Low level of system introduction
B group:
Low level of restructuring x High level of system introduction
C group:
High level of restructuring x Low level of system introduction
D group:
High level of restructuring x High level of system introduction

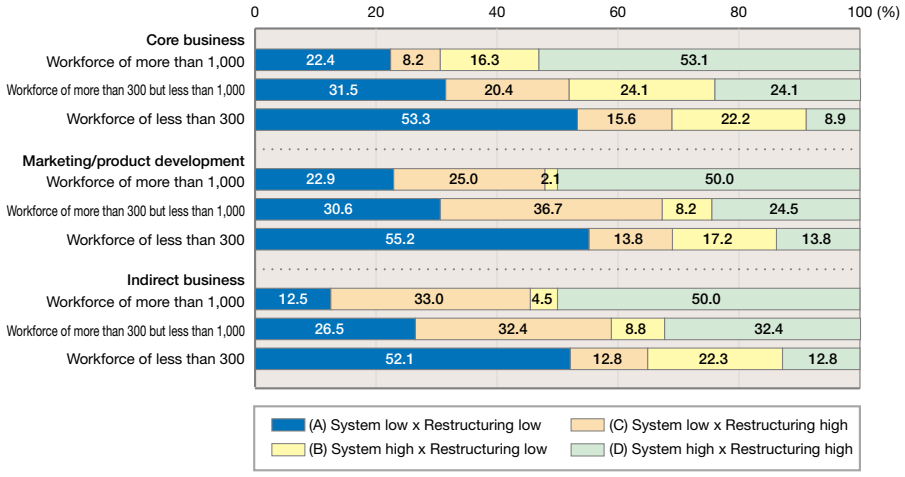
A group:
Low level of restructuring x Low level of system introduction
B group:
Low level of restructuring x High level of system introduction
C group:
High level of restructuring x Low level of system introduction
D group:
High level of restructuring x High level of system introduction

(Source) "Survey on ICT Industry's International Competitiveness and Innovation"

(2) Comparison of the effects of corporations' ICT use and business process/organization restructuring between Japan and the U.S.

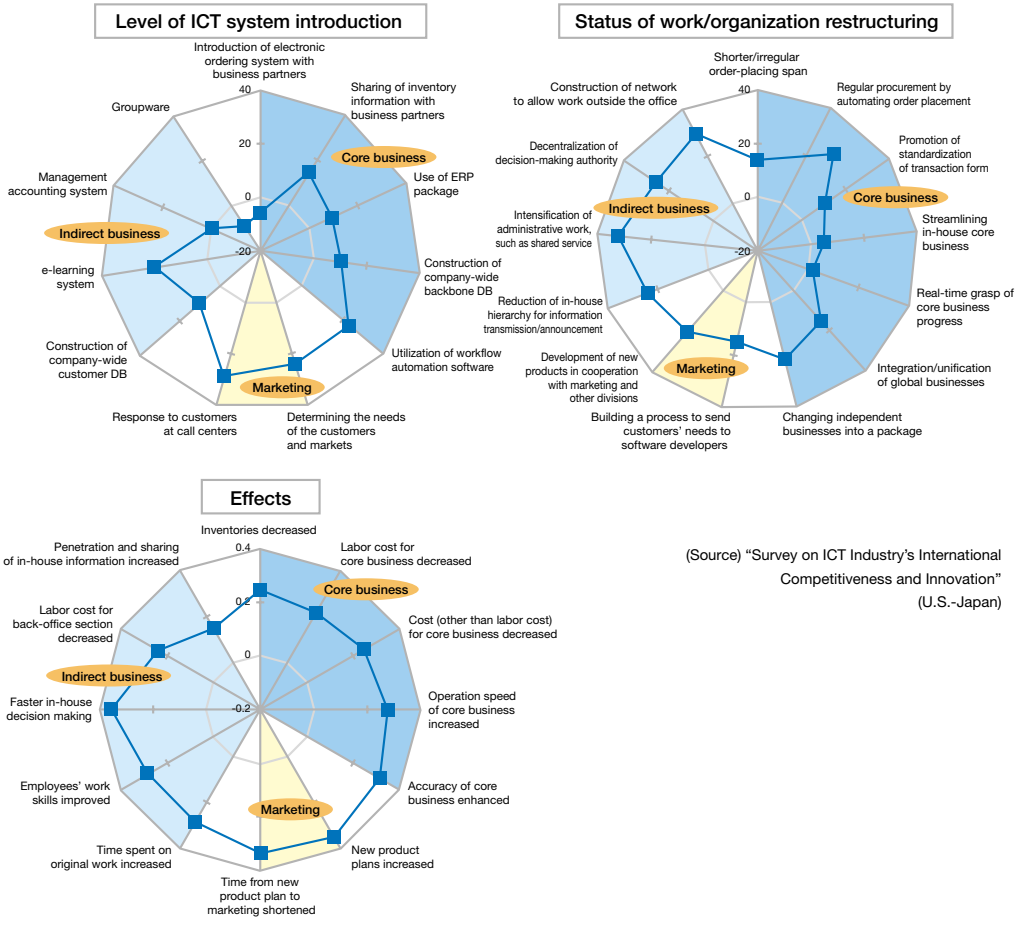
A comparison of the level and effects of corporations' ICT system introduction and business process/organization restructuring between Japan and the United States shows that Japanese corporations introduce ICT systems mainly in the areas related to business efficiency and that they are slower than their U.S. counterparts in utilizing ICT in the areas to enhance their added value relative to market and customers **(Graph 1-59)**. It also shows that, with regard to business process/organization restructur-

Graph 1-58 ICT System Introduction and Work/Organization Restructuring by Scope of Business and by Corporate Size



(Source) "Survey on ICT Industry's International Competitiveness and Innovation"

Graph 1-59 Comparison of the level and effects of ICT system introduction and work/organization restructuring between Japan and the U.S.



(Source) "Survey on ICT Industry's International Competitiveness and Innovation" (U.S.-Japan)

ing, Japanese corporations are particularly negative about reforms requiring reviews of their organization structure. Therefore, Japan has been less successful than the United States in effects that would lead to the enhancement of added value.

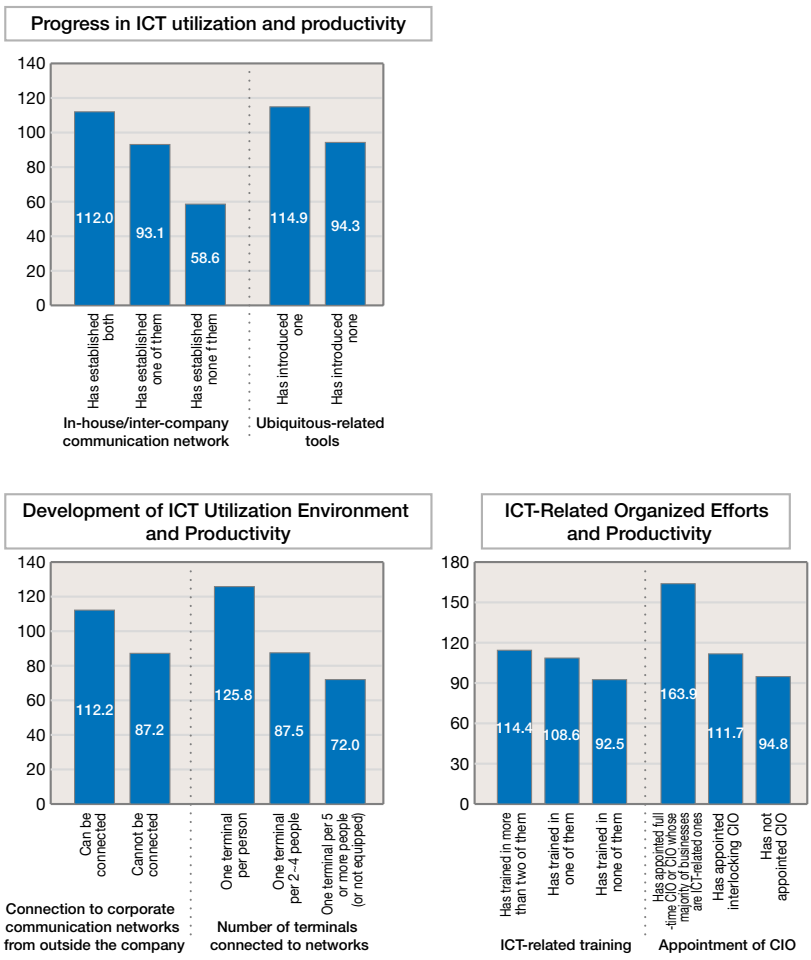
(3) Corporations' ICT use and increased productivity

A study of the relationship between ICT use and productivity, such as progress in ICT use, development of utilization environment, and organizational efforts for ICT use, shows that the productivity of the corporations making progress in ICT use is higher than that of the corporations making little progress in ICT use **(Graph 1-60)**. It also shows that the items that make particularly big differences in productivity are construction of intra/inter-company telecommunication networks, deployment of terminals connected to networks, and appointment of CIO.

(4) Necessity of establishing spatial codes to improve corporate productivity

If corporate activities conducted in the real world were realized in the online space, various corporate duties would be drastically streamlined and automated and corporate productivity would increase drastically by making full use of ICT network functions. To that end, it is essential to establish code systems connecting the real

Graph 1-60 Progress in ICT Utilization, Development of Utilization Environment, Relevant Organized Efforts and their Relationship with Productivity



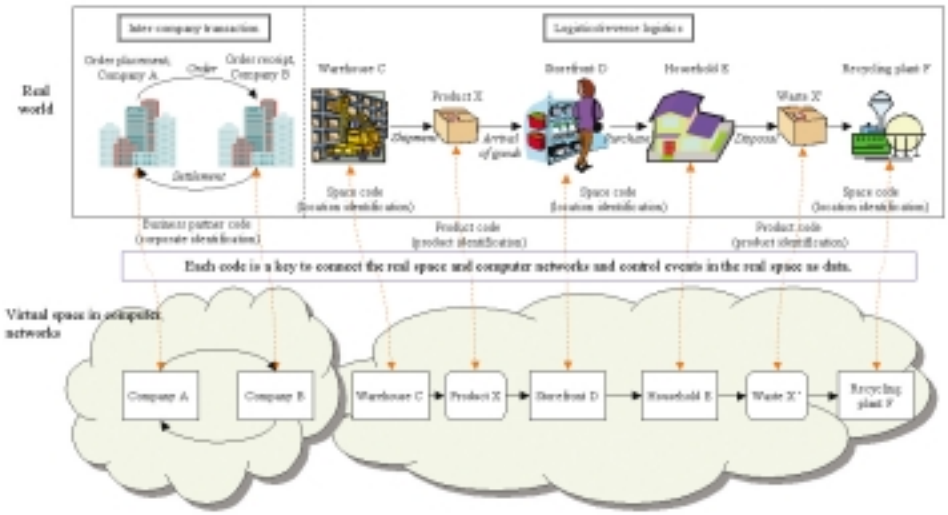
(Source) "2006 Survey on the Use of Communications (Business)," Ministry of Internal Affairs and Communications

world and ICT network space **(Graph 1-61)**. In Japan, in the realm of inter-company transactions, mainly industry-by-industry common infrastructure systems have been developed. But, their use has been mainly limited to big corporations. Therefore, it is necessary to promote the use of infrastructure systems among small and mid-sized corporations.

There are company code, product code and space code. As for company and product codes, code promotion groups have been established in Japan under private global standardization organizations. However, there is no such group for space code.

Since systematic development of codes is expected to increase the efficiency and convenience of various entities' transactions by leaps and bounds, it is important to develop each code as a social infrastructure open to every industry and corporation.

Graph 1-61 Case Where Code is Necessary for Corporate Activities in Network Space



Compiled from Ministry of Internal Affairs and Communications materials

Section 3
ICT and Life and Society

1. Deepening of ubiquitous network society

(1) Penetration of the Internet

The pentration rate of the Internet in 2006 was 68.5%, and the number of Internet users is estimated at 87.54 million (an increase of 2.6% from the previous year) **(Graph 1-62)**.

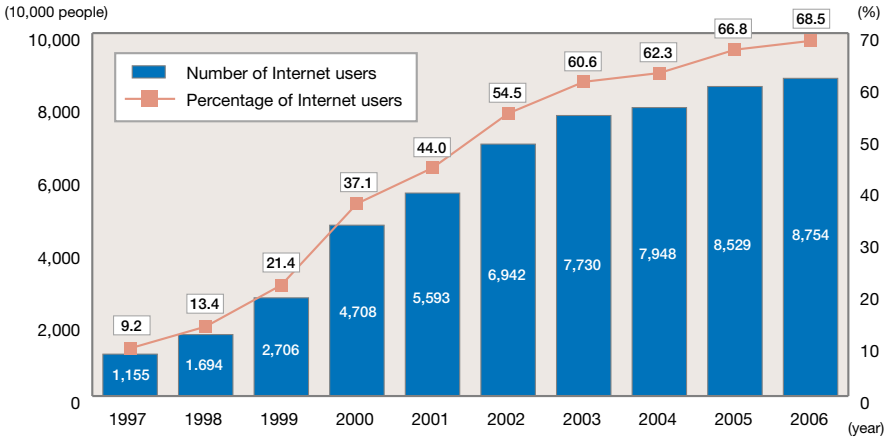
(2) Broadband diffusion

The number of broadband contracts in 2006 stood at 26.44 million **(Graph 1-63)**. Of them, the number of DSL contracts posted a first year-on-year decline to 14.01 million. On the other hand, the number of FTTH contracts posted a sharp increase to 8.8 million, indicating that the use of FTTH has been increasing rapidly.

(3) Mobile diffusion

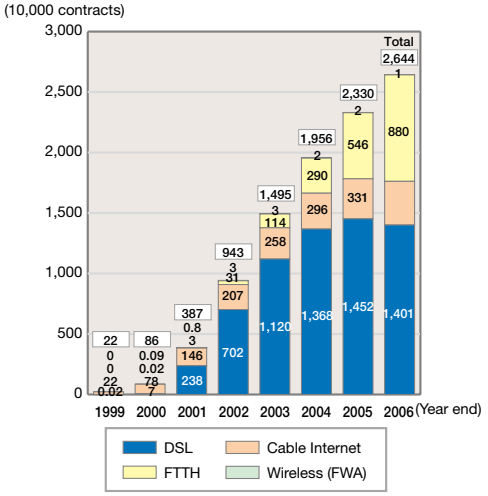
The progress of mobile diffusion plays a central role in promoting the deepening of ubiquitous networks allowing access to networks anytime and anywhere. The number of Internet users via mobile phones, PHS or mobile ICT terminals as of the end of 2006 came to 70.86 million, an increase of 1.63 million from the previous year **(Graph 1-64)**.

Graph 1-62 Transition in the Number and Percentage of Internet Users in the Population



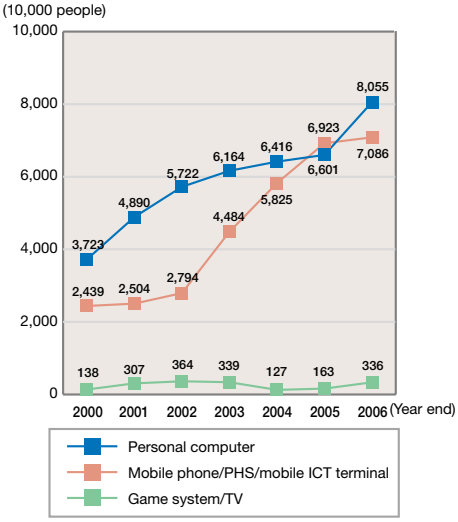
(Source) "2006 Survey on the Use of Communications (Household)," Ministry of Internal Affairs and Communications

Graph 1-63 Changes in the Number of Broadband Contracts



Compiled from Ministry of Internal Affairs and Communications materials

Graph 1-64 Changes in the Number of Internet Users by ICT Terminal



(Source) "2006 Survey on the Use of Communications (Household)," Ministry of Internal Affairs and Communications

(4) Trend toward networked/multi-functional mobile ICT terminals

Mobile ICT terminals have made a drastic advancement due to the progress in the technologies to produce smaller and lighter devices and the advancement of wireless communication technology. The direction of the advancement can be characterized as a move toward "multi-function" and "networking." With mobile phones and other mobile ICT terminals equipped with various functions and connected to networks, the terminal functions will be further advanced.

2. Flat Information Distribution

(1) Increased information generated by individuals

By deepening of a ubiquitous network society, services that are called consumer-generated media, such as blogs, social networking services (SNS) and "word-of-mouth" sites, have been spreading rapidly in recent years. The spread of consumer-generated media means that individuals, who had been passive receivers of information collected, edited and sent out by corporations, have become entities that actively send information by themselves. It can be said that the prevalence of CGM has changed the conventional one-way information flow into two-way information flow on an equal footing.

(2) Blogs and SNS

Of consumer-generated media, blogs and SNS in particular have spread dramatically. The percentage of Internet users browsing blogs opened by individuals comes to around 40%, and 12.4% browse every day **(Graph 1-65)**. The ratio of SNS users to total Internet users is still low. SNS is still in the process of increasing diffusion **(Graph 1-66)**.

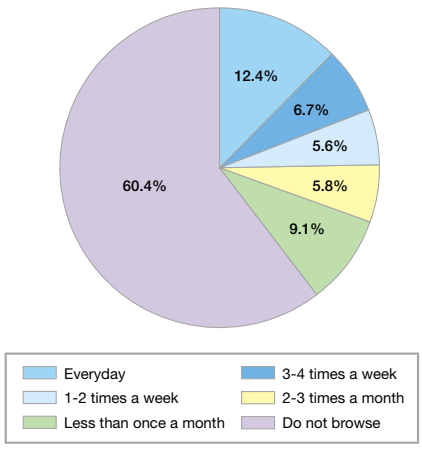
(3) New trend in mass media

While the opportunity for individuals to generate information has expanded, there are new moves in the mass media, the conventional main distributors of information. Business tie-ups and corporate acquisition among existing media and between existing media and Internet companies have been increasing on a global scale. Amid these movements, the Internet has been increasing its impact. The Internet is also increasing its influence as a new advertisement medium. This can be attributed to the facts that, unlike the conventional mass media which distribute undifferentiated contents to the general public, the spread of the Internet has made it possible to distribute contents meeting the needs and interest of specific users without regard to location and time, and that the development of broadband networks has made it easy to distribute video contents.

(4) Emergence of new social and economic systems

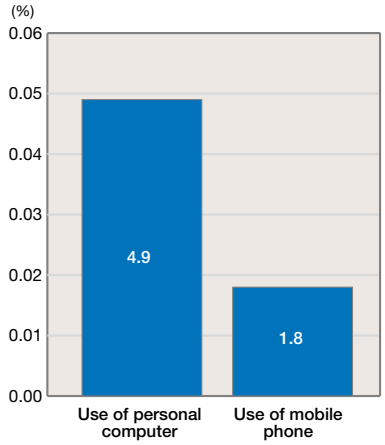
The development of ubiquitous networks has enabled various types of collaboration and diverse information/knowledge accumulation through networks, increasing the influence of individuals. In the field of commerce, it has enabled two-way communications between suppliers and consumers, establishing a route to transmit consumers' detailed needs to suppliers. This has led to the creation of a new "collaborative" business model based on two-way communications between suppliers and consumers, different from the conventional supplier-led business model.

Graph 1-65 Frequency of Browsing Blogs



(Source for Graph 1-65) "Survey on the Use of ICT in Social Life in Japan"

Graph 1-66 Ratio of SNS Users to Internet Users



(Source for Graph 1-66) "2006 Survey on the Use of Communications (Household)," Ministry of Internal Affairs and Communications

3. Change in Life-Style

(1) Change in social life brought about through the use of networks

More than 30% of the people say that their daily activities in social life have changed in particular in purchase, hobby/amusement, sleep and meal. More than half of them attribute the change to the Internet inpurchase and hobby/amusement **(Graph 1-67)**. With ubiquitous networks advancing and the use of ICT networks widely spreading to the realm of the social life of individuals and households, various new patterns of network usage have been created, and this is having a major impact on people's lifestyle.

(2) Diversification of communications

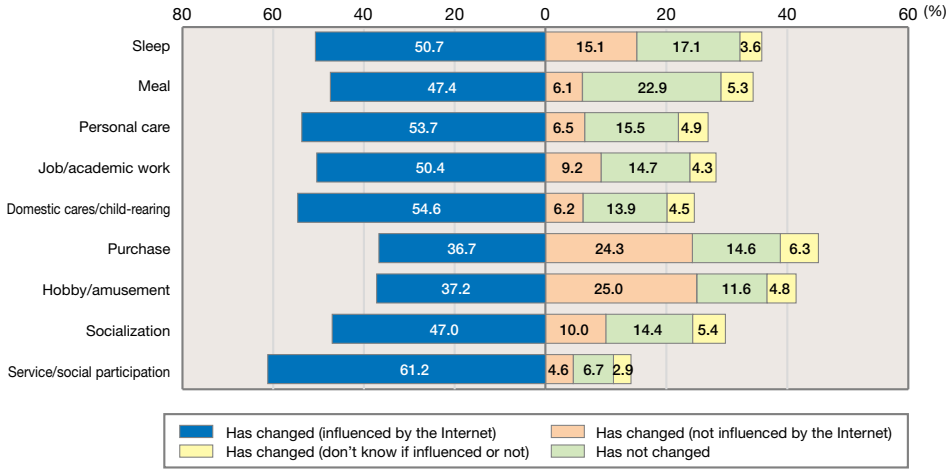
The development of ubiquitous networks, such as progress in broadband and greater use of mobile devices, has made person-to-person communications more diversified, enabling various combinations of communication tools, such as fixed telephone, mobile phone and personal computer, and communication patterns, such as telephone call and e-mail **(Graph 1-68)**.

4. Toward Establishment of Ubiquitous Network Society

(1) Digital divide as seen from each attribute

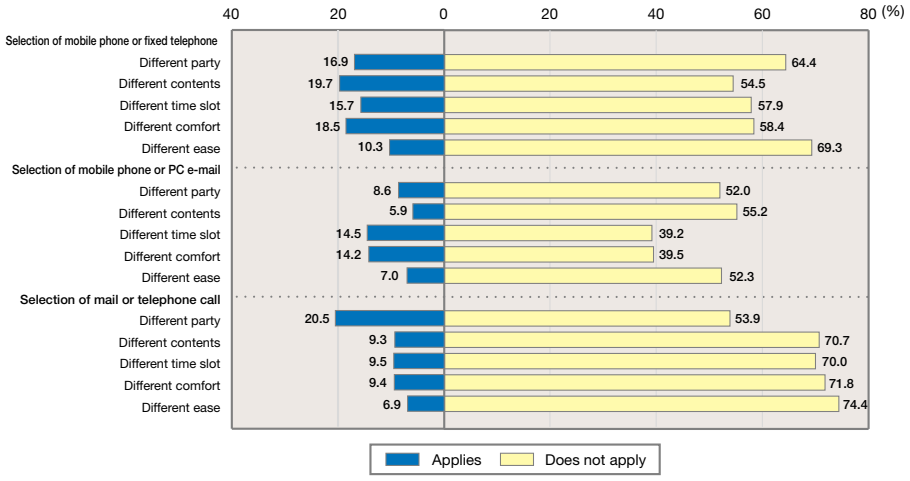
A study of the generation-by-generation use of the Internet as of the end of 2003 and as of the end of 2006 shows that every generation increased the use of the Internet during the three years, with those aged 60 years and older posting a significant increase. As to the use of broadband among those who access the Internet from their home PCs, every generation also increased the use of broadband. However, whereas the percentage of broadband subscribers between the late teens to the 40s is above 50%, the percentage remains below 40% for those aged 50 years and older.

Graph 1-67 Changes in Daily Activities in the Past 1~2 Years and Internet's Impact



(Source) "Survey on the Use of ICT in Social Life in Japan"

Graph 1-68 Selective Use of Communication Tools and Patterns



(Source) "Survey on the Use of ICT in Social Life in Japan"

(2) Digital divide as seen from household income

The act of sorting out necessary information from vast amounts of information and using it effectively has not only the psychological effects of satisfying one's curiosity about knowledge but also economic effects of increasing the likelihood of obtaining a job at higher pay from a variety of job options by, for instance, getting larger amounts of job information via the Internet. This means that in a ubiquitous network society, the digital divide may cause economic disparities among individuals.

A study of the use of the Internet, the use of broadband and the use of mobile Internet by household annual income shows that the lower household annual income is, the lower its usage rate is **(Graph 1-69)**.

5. Safe and Secure Use of the Internet

(1) Information security damage

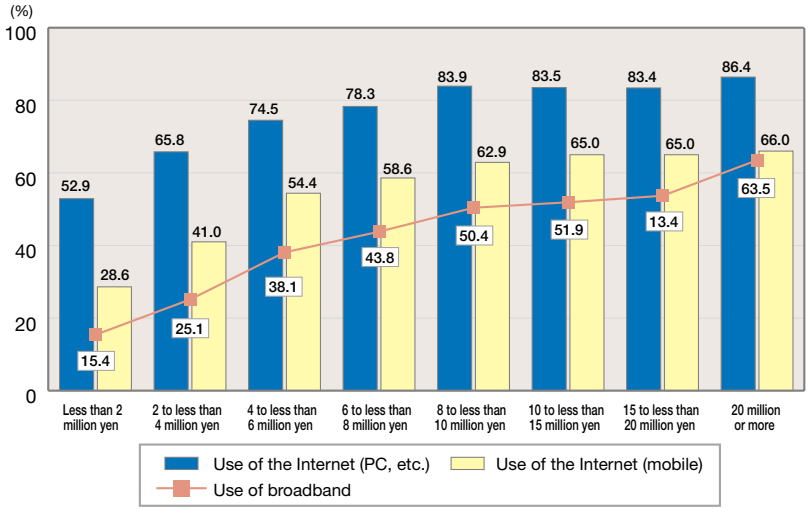
A study of information security damage with regard to personal computers and mobile phones used by households shows that unsolicited e-mails accounted for the largest proportion of damage both to personal computers (38.7%) and mobile phones (29.6%). As to information security damage suffered by corporations, discovery of a computer virus accounted for 35.7% and infection with a virus for 26.4%.

(2) Use of the Internet by juveniles

Amid the increasing use of the Internet among younger people, there are many cases of juveniles being involved in an incident by accessing harmful information on the Internet, such as dating sites, increasing the importance of safe and secure use of the Internet by juveniles.

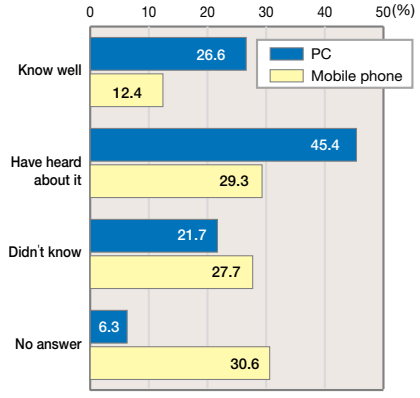
According to a survey on the awareness and use of filtering software against harmful information on the Internet, 21.7% of responding households said they are not aware of filtering software for personal computers and 27.7% of the households are unaware of similar software for mobile phones **(Graph 1-70)**. As to the use of filtering software, 54.7% of the households said they are not using filtering software for personal computers used by children and 33.5% of the households said they are not using similar software for mobile phones **(Graph 1-71)**.

Graph 1-69 Status of Use of Internet and Broadband (by household annual income)

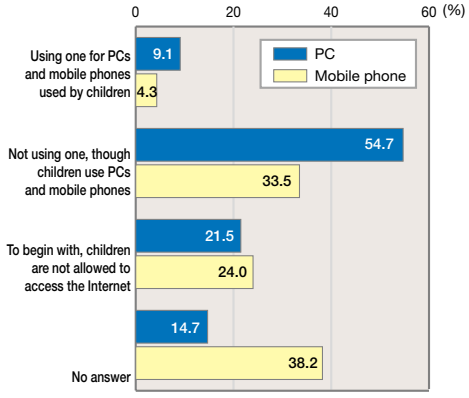


(Source) "2006 Survey on the Use of Communications (Household)," Ministry of Internal Affairs and Communications

Graph 1-70 Awareness of Filtering Software



Graph 1-71 Use of Filtering Software



(Source for Graph 1-70 and 1-71) "2006 Survey on the Use of Communications (Household)," Ministry of Internal Affairs and Communications