MIC
Ministry of Internal Affairs and Communications

Information and Communications in Japan 2006

Feature: Ubiquitous Economy

<Outline>

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Ministry of Internal Affairs and Communications

Feature: Ubiquitous Economy

1. Objectives

○ Today, Japan faces various challenges associated with social life and economic activities due to changes in the social and economic environments including the declining and aging of the population.

○ Therefore, this paper studies the mechanism by which development of ubiquitous networks could transform the Japanese social and economic systems and create economic vitality.

** Ubiquitous network: ICT network through which users can freely use network services, terminals, and digital content at any time and place, characterized by its extensive incorporation into users' lives.*

** Ubiquitous economy: social and economic characteristics brought about by development of ubiquitous networks*

<Overall structure>

Chapter 1 Ubiquitous Economy

Section 1 Trends of ICT markets ⇒ *Economic performance toward achieving a ubiquitous network society*

Section 2 Promoting diffusion of ubiquitous networks
Section 3 Trends of fusion/collaboration between communications and broadcasting
Section 4 New trends created by ubiquitous networks
Section 5 Rise of consumer-generated media (CGM)
Section 6 Changes in consumption and buying behaviors
⇒ *Impact of ubiquitous networks on social and economic activities: from the viewpoint of users*

Section 7 New advertising strategies of businesses
Section 8 Improvement in market efficiency
Section 9 New developments in content distribution
Section 10 Advancement in financial transactions through use of ICT
Section 11 Impact on labor economy
Section 12 Progress in use of ICT in businesses
⇒ *Impact of ubiquitous networks on social and economic activities: from the viewpoint of businesses and markets*

Section 13 Challenges toward achieving a ubiquitous network society ⇒ *Responses to the negative aspects of a ubiquitous network society*

Chapter 2 Current Sate of ICT Industries (current state as seen from data)

Chapter 3 Trends of ICT Policies (focusing on MIC's efforts)

2. Key Points

Ubiquitous Economy

(1) Economic performance toward achieving a ubiquitous network society (macro level)

- **Information and communications technology (ICT) industries are gradually increasing their economic resilience centering on ICT manufacturing businesses. They greatly contribute to changes in real GDP.**
- **On the other hand, although the amount of ICT capital stock is increasing in various industries, obvious improvements in productivity have yet to be observed.**

  → Impacts of the development of ubiquitous networks are expected to emerge in the following micro-level social and economic activities first, and then spill over to the macro level.

(2) Impact of ubiquitous networks on social and economic activities (micro level)

(i) Achievement of diverse information distribution societies

User needs are expected to expand with the advancement of fusion between communications and broadcasting. Also, the Long Tail phenomenon (achieving sales of products with low and diverse demand) will emerge due to the new trends including Web 2.0, while various knowledge and opinions will be increasingly provided or returned to society with the rise of consumer-generated media (CGM) such as blogs and social networking services (SNS).

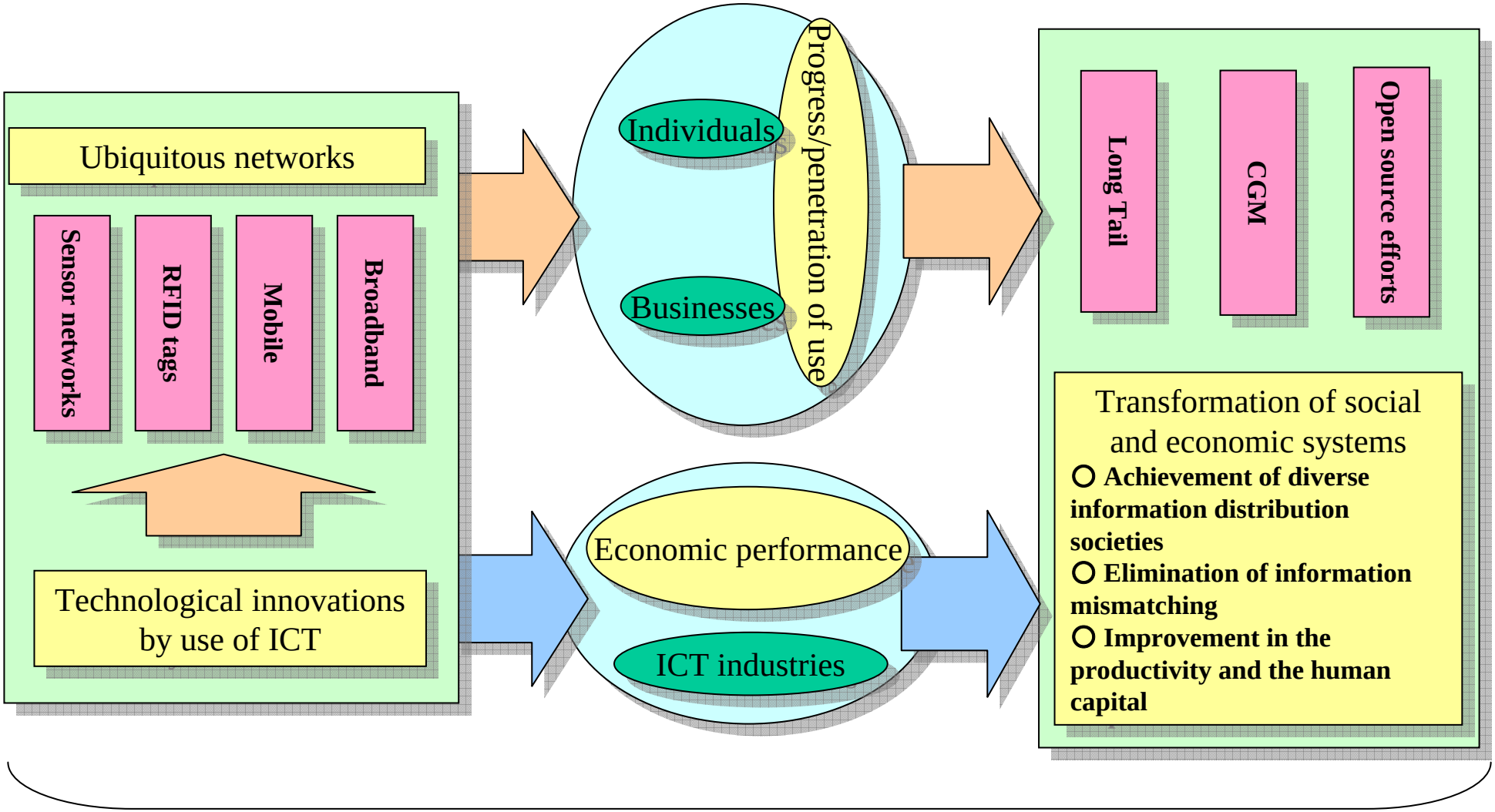
(ii) Elimination of information mismatching

With further development of Internet ads, portal sites, and search engines, the mismatching between information suppliers and information seekers will be eliminated, leading to greater user satisfaction and stronger business competitiveness.

(iii) Improvement in the productivity and the human capital

As observed in the open-source efforts, development of a networked environment has the potential of facilitating knowledge accumulation and knowledge-based collaborations, and improving the productivity. Furthermore, in line with increased introductions of ICT in businesses, labor demand will increase for specialists who can create originality and scarcity value.

Ubiquitous Economy: Study Viewpoint



Ubiquitous economy

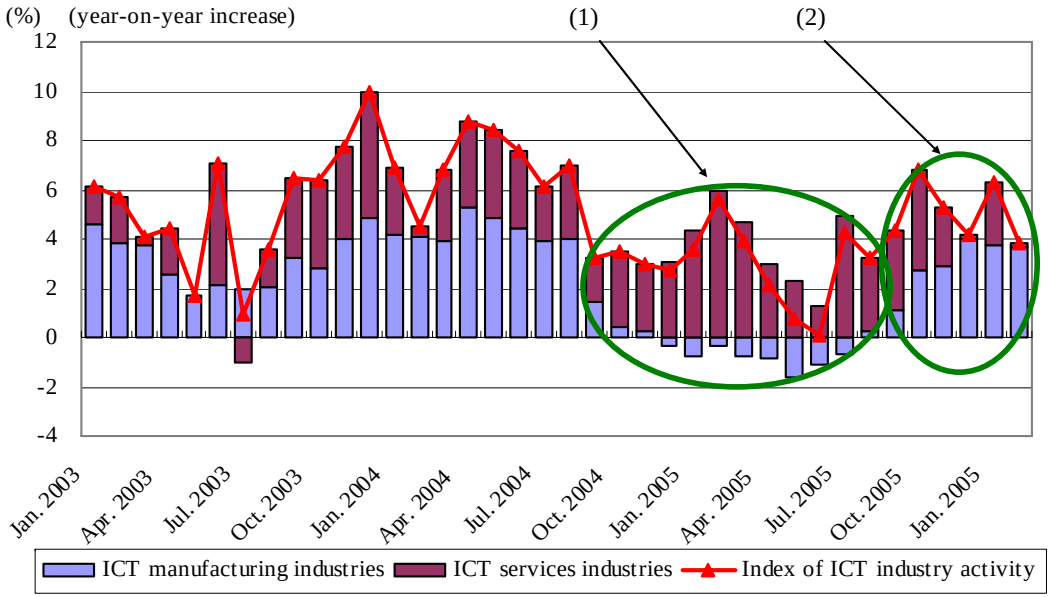
(social and economic characteristics brought about by the development of ubiquitous networks)

1. Trends of ICT markets

(1) Trends of ICT industries

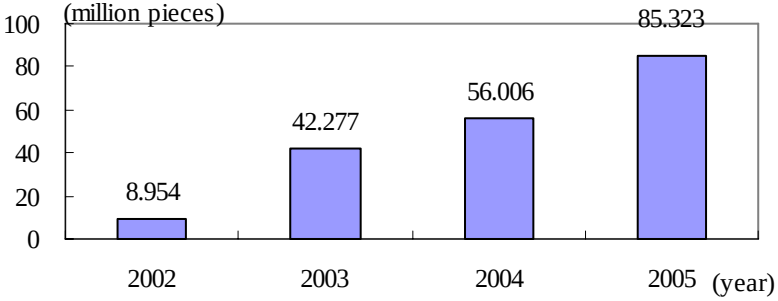
- **From the second half of 2004 to the first half of 2005, the ICT industries saw a temporary slowdown in their overall recovery, because although the activity of the ICT services industries increased, that of the ICT manufacturing industries declined due to inventory adjustments of ICT-related goods worldwide. [Figure 1 (1)]**
- **Since mid-2005, overall ICT industries have recovered again, reflecting the recovery in the ICT manufacturing industries including semiconductors. [Figure 1 (2)]**
- **The increase in semiconductor production relates to the increased shipment of ubiquitous network-related goods such as RFID tags and contactless smart cards. [Figures 2 and 3]**

Figure 1: Transition in the Index of ICT Industry Activity



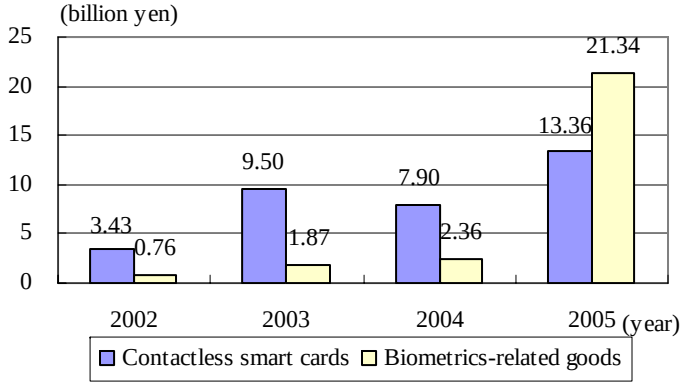
Produced from the Ministry of Economy, Trade and Industry (METI), “Indices of All Industry Activity,” “Indices of Industrial Production,” and “Indices of Tertiary Industry Activity.”

Figure 2: Transition in the Shipment Quantity of RFID Tags



Produced from materials of the Japan Automatic Identification Systems Association.

Figure 3: Transition in the Shipment Value of Contactless Smart Cards and Biometrics-related Goods



Produced from materials of the Japan Automatic Identification Systems Association.

1. Trends of ICT markets

(2) Impact of ICT on economic growth (Part 1)

○Effects of ICT on economic growth can be categorized into the following three:

Effect 1: effect from the growth of ICT industries

Effect 2: effect from an increase in ICT capital stock (increased ICT-related investment)

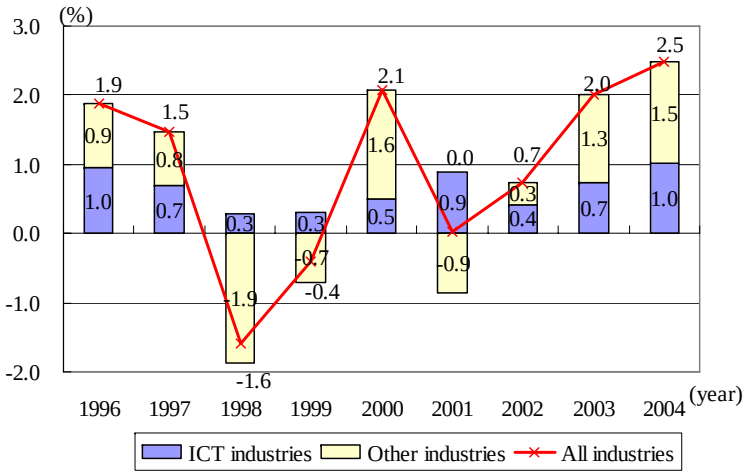
Effect 3: effect from improved productivity in the respective industries through progress in the use of ICT in industries and businesses (increased ICT capital stock)

○Each effect is explained below.

[Effect 1] ICT industries have a large impact on economic growth, contributing to 40.0% of the real gross domestic product (GDP) growth. [Figure 4]

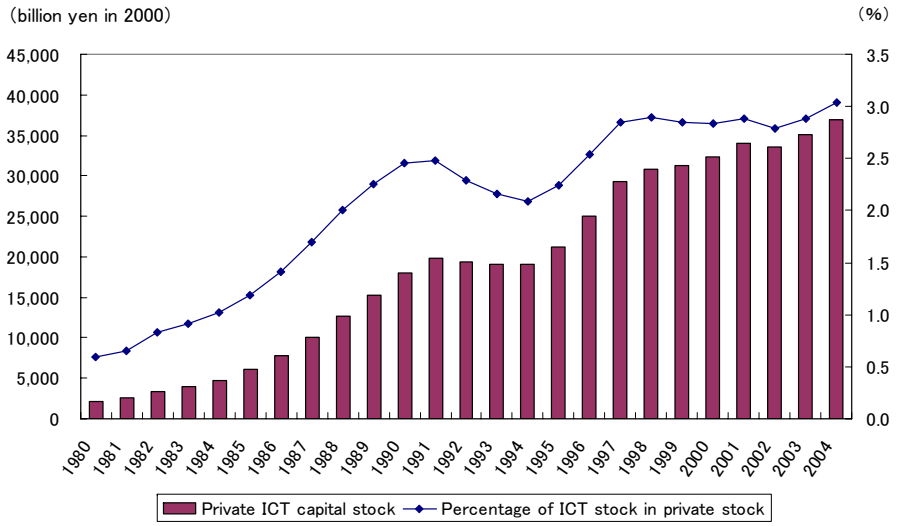
(Effects 2 and 3 are explained on the following page.)

Figure 4: Contribution of ICT Industries to the Changes in Real GDP



Source: "Survey on Economic Analysis of ICT."

Figure 5: Transition in (Real) ICT Capital Stock



Source: "Survey on Economic Analysis of ICT."

1. Trends of ICT markets

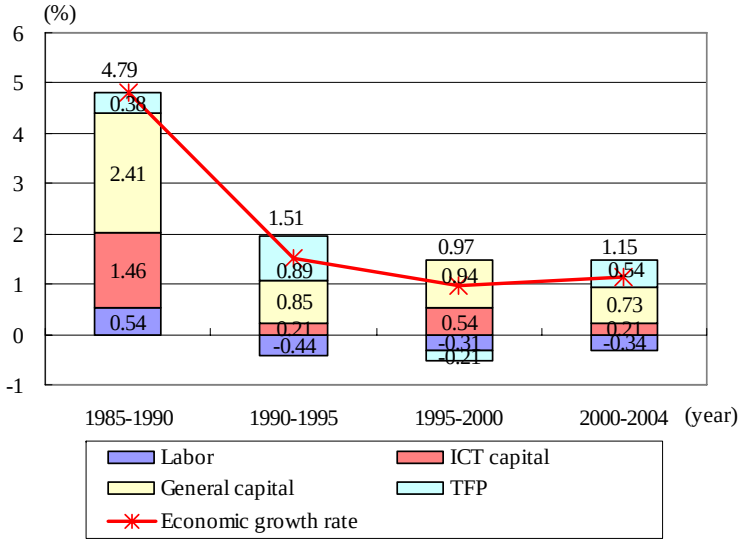
(2) Impact of ICT on economic growth (Part 2)

[Effect 2] ICT capital stock, which contributes to 18.5% of economic growth, has a large impact on economic growth given that it accounts for 2% to 3% of private capital stock. [Figure 5 on the previous page and Figure 6 below]

[Effect 3] The amount of ICT capital stock has increased since the mid-1990s. However, looking at the productivity (total factor productivity: TFP) of various industries, improvements have not become quite evident, except in the ICT industries and the electric machinery industries. [Figure 7]

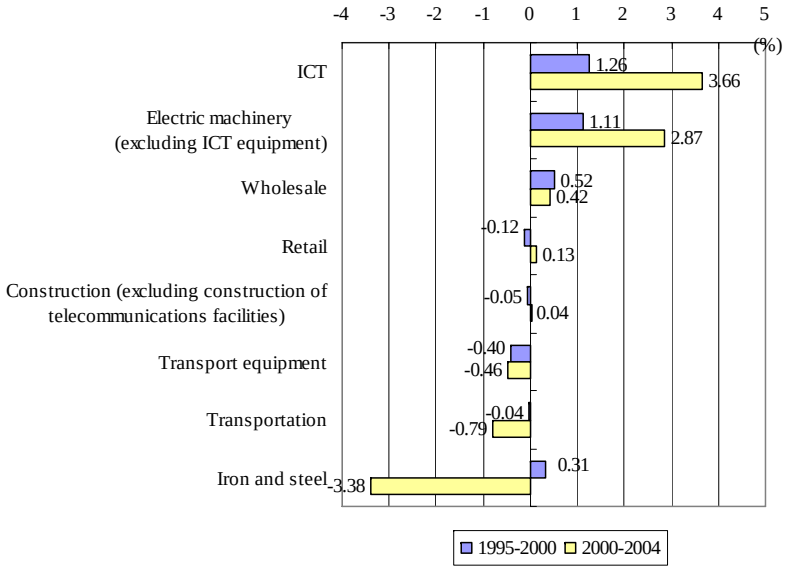
→ A micro-level analysis has revealed that the introduction of ICT in businesses leads to increased productivity if conducted in line with organizational reform. [Figure 37 on p. 19]

Figure 6: Contribution of ICT Capital to the Economic Growth Rate



Source: "Survey on Economic Analysis of ICT."

Figure 7: Increase in Total Factor Productivity by Industry

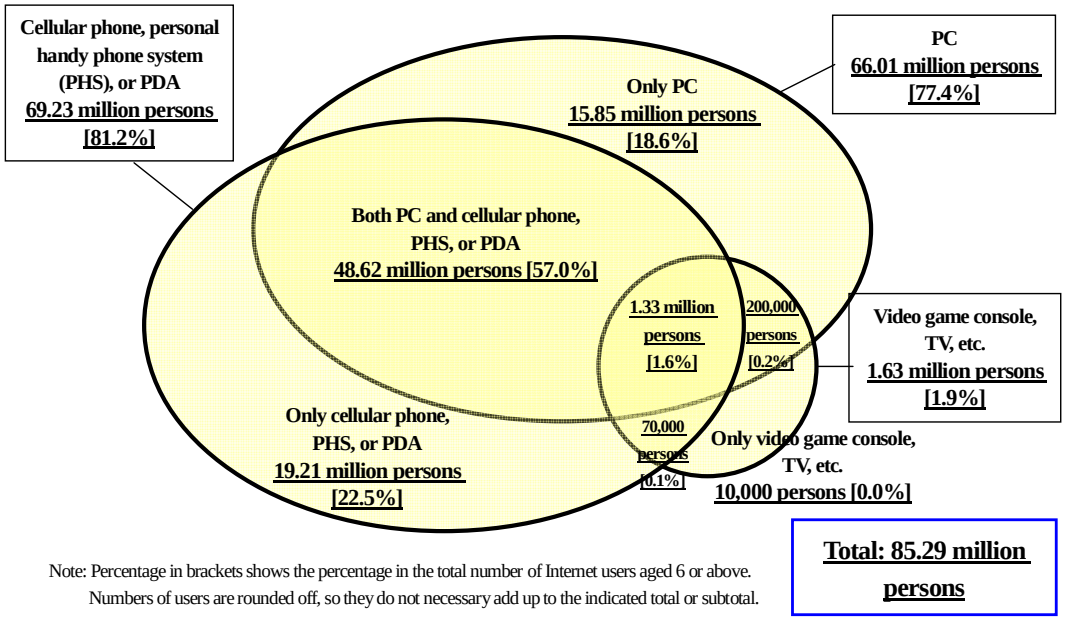


Source: "Survey on Economic Analysis of ICT."

2. Promoting diffusion of ubiquitous networks

- **The number of Internet users reached 85.29 million by the end of 2005. With regard to Internet terminals for private use, the number of users of mobile terminals including cellular phones increased by 18.8% from the previous fiscal year to 69.23 million, surpassing the number of personal computer (PC) users for the first time. In this manner, Internet use is becoming more and more mobile. [Figures 8 and 9]**
- **Mobile ICT terminals including cellular phone handsets, digital audio players, and personal digital assistance (PDA) equipment have come to provide more advanced functions to meet the high expectations for them to also serve as music players and electronic wallets. [Figure 10]**

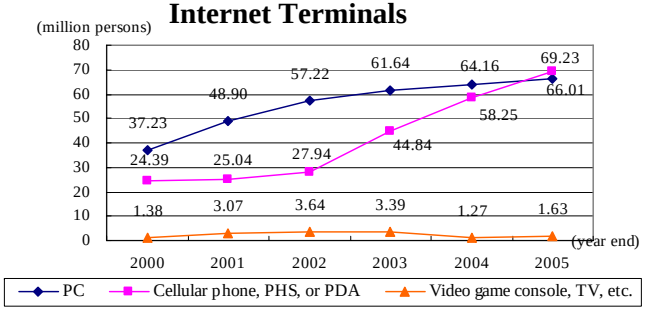
Figure 8: No. of Household Members (Types of Internet Terminals)



Note: Percentage in brackets shows the percentage in the total number of Internet users aged 6 or above.
Numbers of users are rounded off, so they do not necessary add up to the indicated total or subtotal.

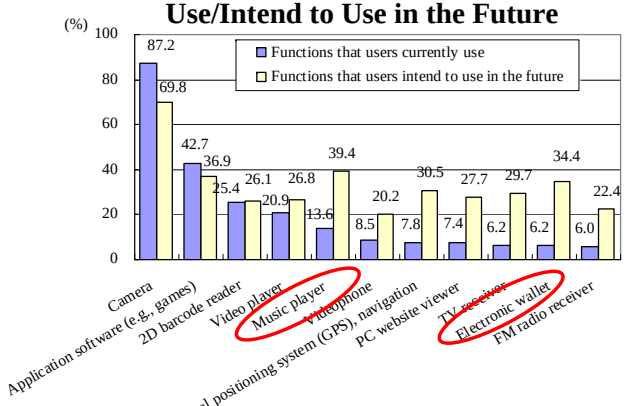
Source: "Communications Usage Trend Survey in 2005."

Figure 9: Transition in the Number of Users of the Respective Internet Terminals



Source: "Communications Usage Trend Survey in 2005."

Figure 10: Cellular Phone and PHS Functions that Users Currently Use/Intend to Use in the Future

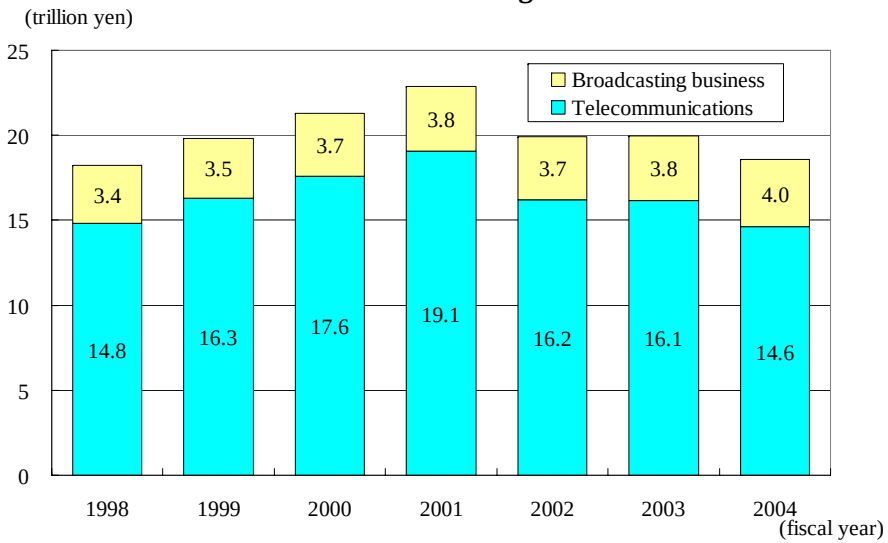


Source: "Survey on the State of Use of Ubiquitous Goods."

3. Trends of fusion/collaboration between communications and broadcasting

- **Communications and broadcasting industries, which had a market size of about 20 trillion yen in fiscal 2004, are expected to grow into leading industries that contribute to Japan's economic growth, with new entrants coming in and business competition intensifying due to the acceleration of fusion and collaboration between communications and broadcasting. [Figure 11]**
- **Acceleration of fusion and collaboration between communications and broadcasting will bring the merits of technological innovations, such as a shift to IP-based systems, to all sectors including the general public and industries. It will also contribute to strengthening Japan's ability to send cultural and other information to the world (soft power).**
- **Currently, diverse services (Triple Play, one-segment broadcasting, etc.) are provided through collaboration between communications and broadcasting. [Figure 12]**
- **The Panel on Frameworks of Communications and Broadcasting (chair: Satoshi Matsubara, professor at Toyo University), established in January 2006, is holding comprehensive discussions on the establishment of a legal system for such fusion, review of communications-related regulations, broadcasting deregulation, and reform of the Japan Broadcasting Corporation (NHK), with the aim of making Japan a "broadband, mobile, and TV superpower."**

Figure 11: Transition in the Market Size (Sales) of Communications and Broadcasting Industries



Produced from the "Basic Survey on the Communications Industry."

Figure 12: Current State of Triple Play Services

Service Name	Telephone Service	Internet Access Service	Video Distribution Service	Basic Fee for the 3 Services Combined
Plala Hikari Triple Pack	Between Plala Phones for Flet's: free Domestic call: 8.4 yen (3 min.)	Max. 100 Mbps	Multichannel broadcasting (50 ch. or more), video on demand (VOD) (4,000 to 5,000 titles)	9,849 yen (detached house) 7,065 yen (apartment)
* Plala Networks	* Provided by Plala Networks	* Provided by Plala Networks	* Provided by On-line TV (4th Media)	
Flet's Hikari Premium (NTT West + OCN + On Demand TV) * NTT West	Between OCN .Phones: free Domestic call: 8.4 yen (3 min.)	Max. 100 Mbps	Multichannel broadcasting (21 ch.; CS programs), VOD (about 3,000 titles)	8,683 yen (detached house) 7,024 yen (apartment)
	* Provided by OCN	* Provided by OCN	* Multichannel broadcasting provided by I-Cast; VOD provided by On Demand TV	
OCN Hikari with Flet's	Between OCN .Phones: free Domestic call: 8.4 yen (3 min.)	Max. 100 Mbps	VOD (unlimited access to 100 titles)	8,694 yen (detached house) 6,174 yen (apartment)
* OCN (NTT Communications)	* Provided by OCN	* Provided by OCN	* Provided by OCN	
KDDI Hikari Plus	Between Hikari Plus phones: free Domestic call: 8.4 yen (3 min.)	Max. 1 Gbps	Multichannel broadcasting (30 ch.; CS programs), VOD (about 4,500 titles), online karaoke	9,555 yen (detached house) 7, 245 yen (apartment) (when applying the KDDI set discount)
* KDDI	* Provided by KDDI	* Provided by KDDI (DION)	* Provided by KDDI	
Cable Plus	In-prefecture call: 8.4 yen (3 min.) Out-of-prefecture call: 15.75 yen (3 min.)	Depends on the CATV broadcaster (e.g., max. 100 to 20 Mbps)	Depends on the CATV broadcaster (e.g., multichannel broadcasting [100 ch.; terrestrial, BS, CS programs])	Depends on the CATV broadcaster (e.g., JCN Chiba: 9,495 yen)
* KDDI + affiliate cable television (CATV) broadcasters	* Provided by KDDI	* Provided by affiliate CATV broadcasters	* Provided by affiliate CATV broadcasters	
Yahoo! BB Hikari TV Package	Between BB phones: free Domestic call: 8.4 yen (3 min.)	Max. 100 Mbps	Multichannel broadcasting (41 ch.; CS programs), VOD (about 5,000 titles)	7,234 yen (detached house) 4,189 yen (apartment)
* SoftBank Group	* Provided by Yahoo! BB	* Provided by Yahoo! BB	* Provided by BB Cable	
J:COM	In-city call: 8.3 yen (3 min.) Between J:COM Phones: 5.3 yen (3 min.)	Max. 30 Mbps	CATV multichannel broadcasting (81 ch.; terrestrial, BS, CS programs), VOD (about 3,500 titles)	11,350 yen
* J:COM Tokyo	* Provided by J:COM Tokyo	* Provided by J:COM Tokyo	* Provided by J:COM Tokyo	

Source: materials of the Panel on Frameworks of Communications and Broadcasting.

4. New trends created by ubiquitous networks

(1) New trends created by Web 2.0

- **New concept "Web 2.0," which responds to the increase and diversification of users caused by the development of ubiquitous networks, is in the spotlight.**
- **Web 2.0 enables the accumulation of diverse knowledge and various collaborations based on "user participation" and "open source," using the Internet as the platform. [Figure 13]**
  → A typical example is "Wikipedia," a free online encyclopedia jointly produced by general users. [Figure 14]

Figure 13: Outline of Web 2.0

Basic concept

Building a new Internet world that is different from the conventional one (Web 1.0) by effectively making use of the potentials of the Internet

→Eliminating software/hardware-specific restrictions and allowing the accumulation of diverse knowledge and various forms of collaboration by using the Internet as the platform (common basis)

Characteristics

(1) User participation: sending information through consumer-generated media (CGM)

e.g., blogs, social networking services (SNS), online encyclopedias (Wikipedia)

(2) Open source: disclosing the accumulated data (databases) and information technology to the public

e.g., Google and Amazon.com disclosing their databases and application programming interfaces (API) (method of accessing their systems, etc.) to the public

Long Tail phenomenon

Forming a market for products with low and diverse demand (Long Tail) by taking advantage of the characteristics of Web 2.0

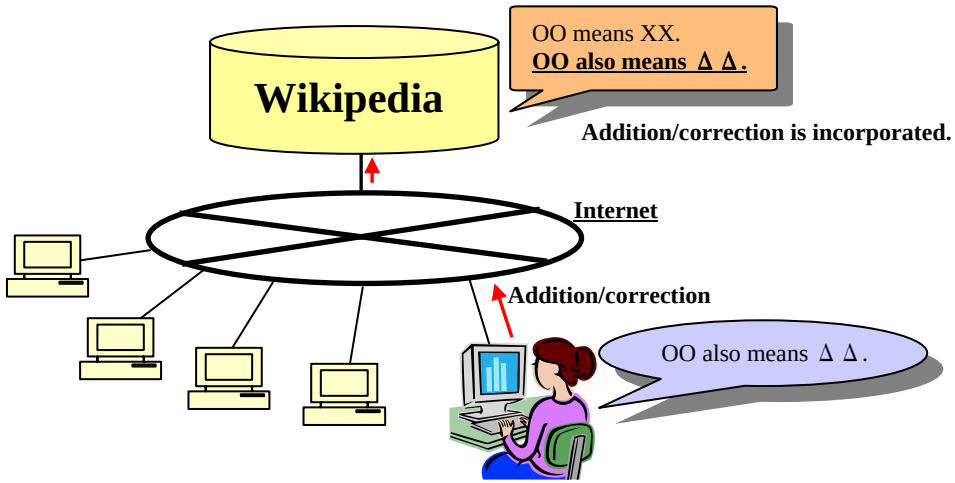
e.g., Amazon.com's book sales (about one-third of its total sales are books that are difficult to sell at general book stores); Google's advertised goods (a large number of CGM [blogs, etc.] are subject to advertisement)

Figure 14: Outline of Wikipedia

Wikipedia

Free online encyclopedia jointly produced by general users

★Any user can add new entries or add to/correct the descriptions.
★The descriptions are constantly improved and expanded with many users involved in each entry.
★It is free but covers more extensive information than existing dictionaries.



4. New trends created by ubiquitous networks

(2) Long Tail phenomenon

- **Under the Web 2.0 environment, small and diverse demands accumulate to form a market (Long Tail phenomenon). [Figure 15] A typical example is Amazon.com's book selling. One-third of Amazon.com's sales are attributable to low-demand books that are difficult to keep in stock in ordinary book stores.**
  →Amazon.com has been selling books since the past, but has aimed at developing a business using the Web 2.0 concept. For instance, it uses the vast number of customer reviews for cultivating demand, and discloses application programming interfaces (APIs) indicating the method of access to its databases and systems in order to improve and expand its services.
- **The percentage of the sales quantity of high-ranking Oricon Chart songs in the total production quantity is declining every year, indicating the progress in diversification. [Figure 16] This suggests high potential for the establishment of Long Tail business models for content distribution services as Web 2.0 develops in the future.**

Figure 15: Long Tail Phenomenon

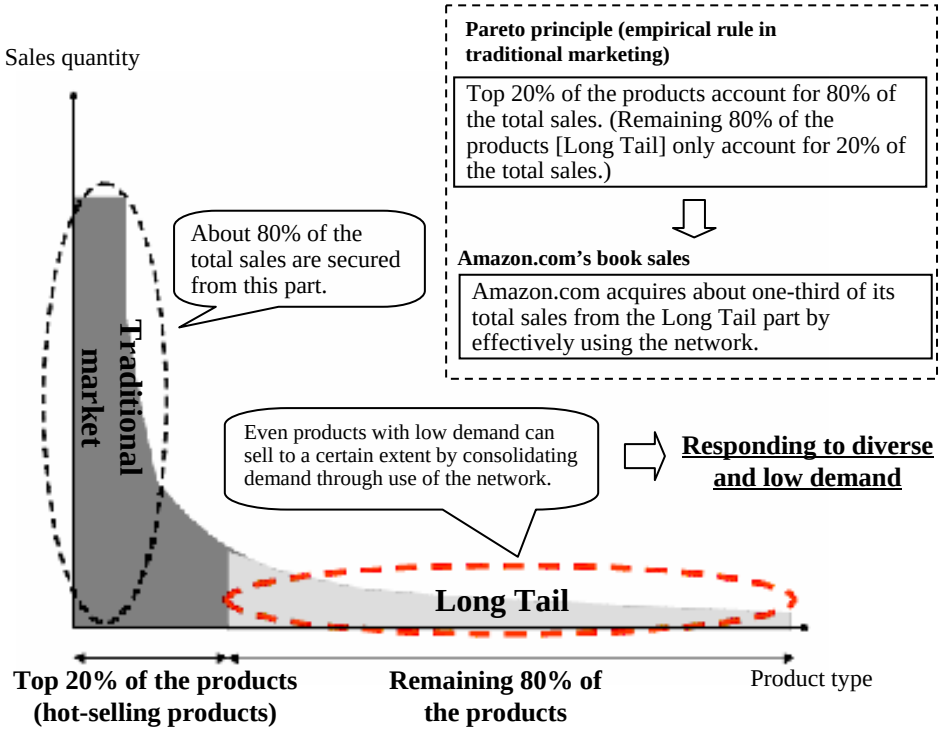
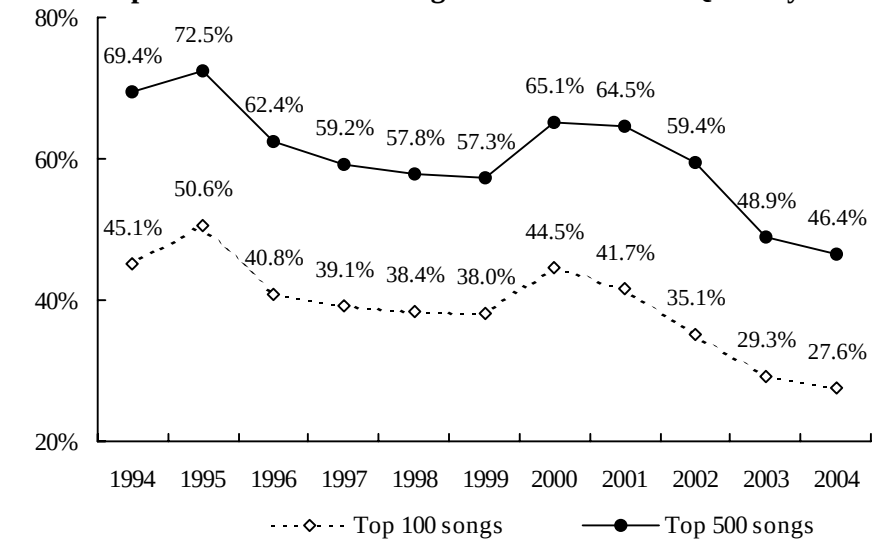


Figure 16: Transition in the Shares of Total Sales Quantities of Top 100 and Top 500 Oricon Chart Songs in the Production Quantity



$$\frac{\sum_{t=1}^{n} \text{sales quantity } t}{\text{production quantity of CD singles}}$$

calculated for n=100 and n=500

(sales quantity *t*: sales quantity for the song ranking at number *t*)

4. New trends created by ubiquitous networks

(3) Open-source trend and increase of collaborations

- **Recently, open source software (OSS) is making progress as a platform for accumulating knowledge that is scattered diffusely in society, and making collaborations. [Figure 17]**
- **With respect to its use, however, software can easily generate a network effect*1 or a lock-in effect*2 as its general nature, so its market share is inclined to be dominated by a single company. [Figure 18]**
- **The sales of software in Japan totals 8.3 trillion yen. Japan imports software worth around 360 billion yen, which is approximately ten times the value of its software export. [Figure 19]**

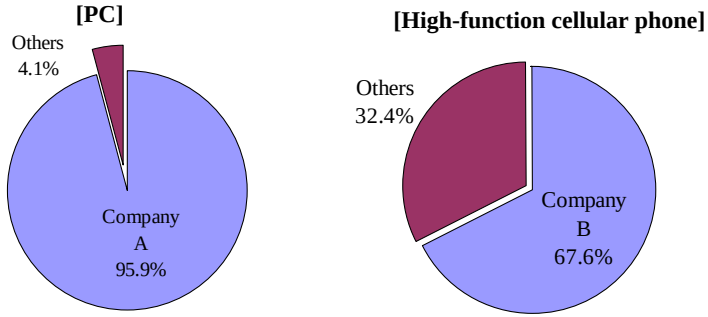
Figure 17: Examples of OSS by Category

Category	Examples of OSS
Operating system (OS)	Linux、FreeBSD、Darwin
Internet server	Apache (WWW server) BIND (DNS server) Sendmail (mail server) Zope (application server) Samba (file sharing server)
Database	MySQL、PostgreSQL
Desktop environment	GNOME、KDE
Desktop/application software	Mozilla (browser) StarOffice/OpenOffice.org (office suite) GIMP (graphics editor)
Script language	Perl、Python、Ruby、Tcl/Tk

Produced from Software Information Center, “Current State and Future Challenges of Open Source Software.”

*1 Network effect: Utility that an individual can enjoy from a certain commodity or service depends on the number of people using it. Another typical example is the facsimile machine.
*2 Lock-in effect: By using the same commodity or service for a long time, it becomes difficult to switch to another commodity or service due to the high cost involved in switching. Another typical example is the keyboard.

Figure 18: Global Market Share for OS (2005)



* On a shipment quantity basis.

Produced from materials of Gartner Dataquest.

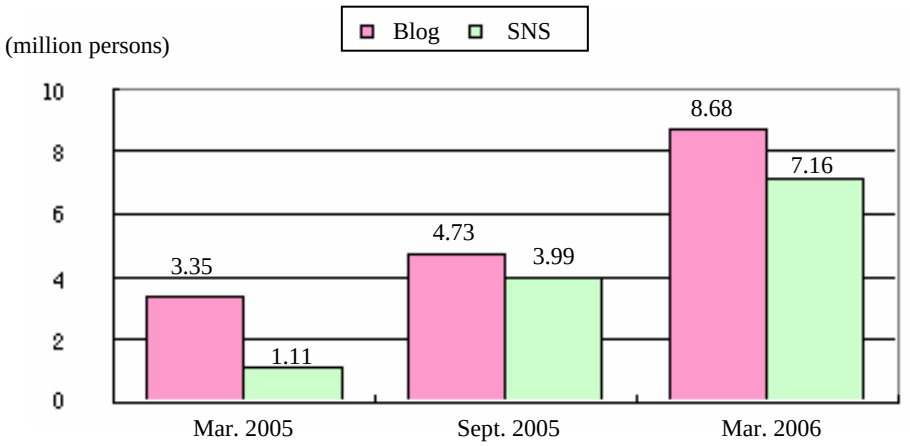
Figure 19: Transition in Software Import and Export

Produced from the Japan Electronics and Information Technology Industries Association, Japan Personal Computer Software Association, Japan Information Technology Services Industry Association, “2005 Fact-Finding Survey on Overseas Transactions and Employment of Non-Japanese Workers in the Computer Software Field.”

5. Rise of consumer-generated media (CGM)

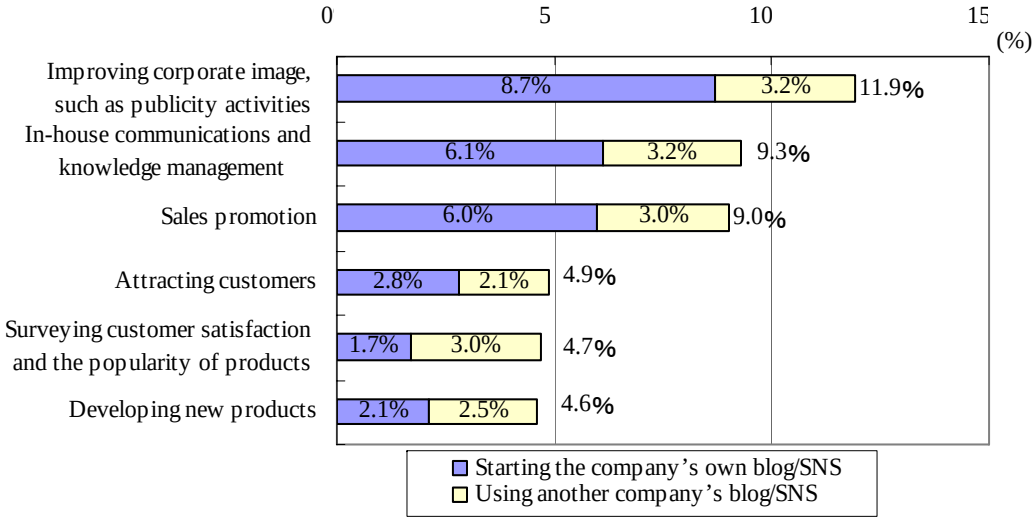
- **With the rise of blogs, social networking services (SNS), and other CGM, consumers can now send out information freely and actively without expert knowledge. In addition, communities formed by such CGM are gradually increasing their impact. [Figure 20]**
- **As various entities including businesses send out information actively through blogs and SNS, diverse knowledge and opinions will be provided or returned to society. [Figure 21]**

Figure 20: Transition in the Number of Registered Users of Blogs and SNSs



Source: "Number of Registered Users of Blogs and SNSs"

Figure 21: Use of Blogs and SNSs by Businesses

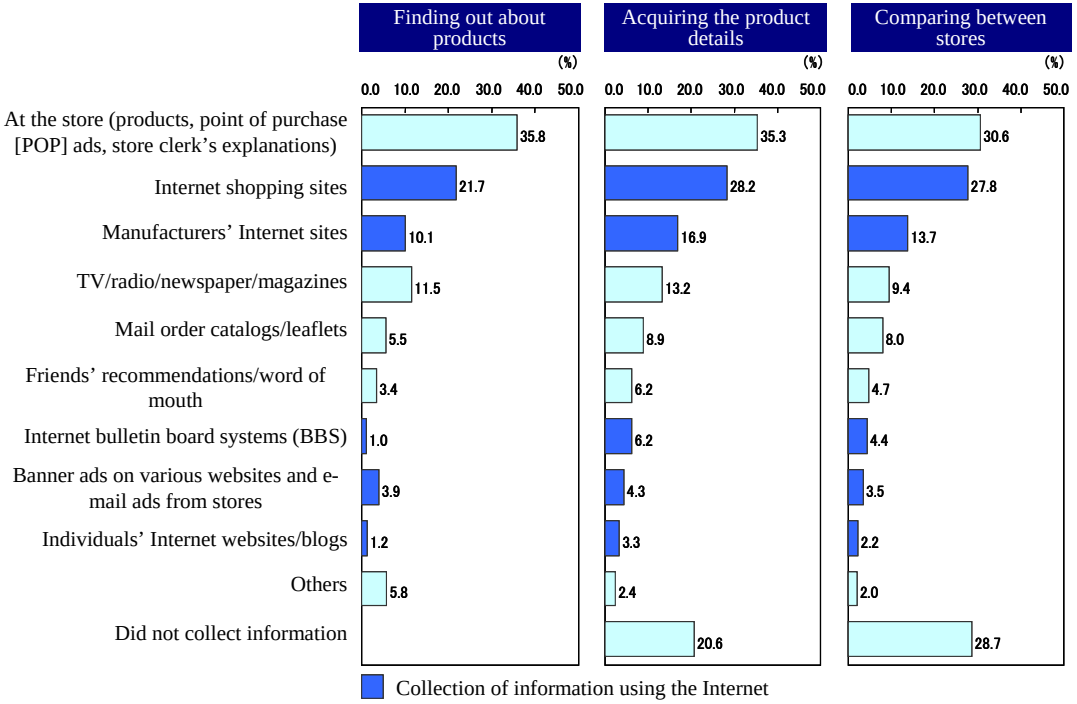


Source: "Survey on the Use of ICT Networks by Businesses."

6. Changes in consumption and buying behaviors

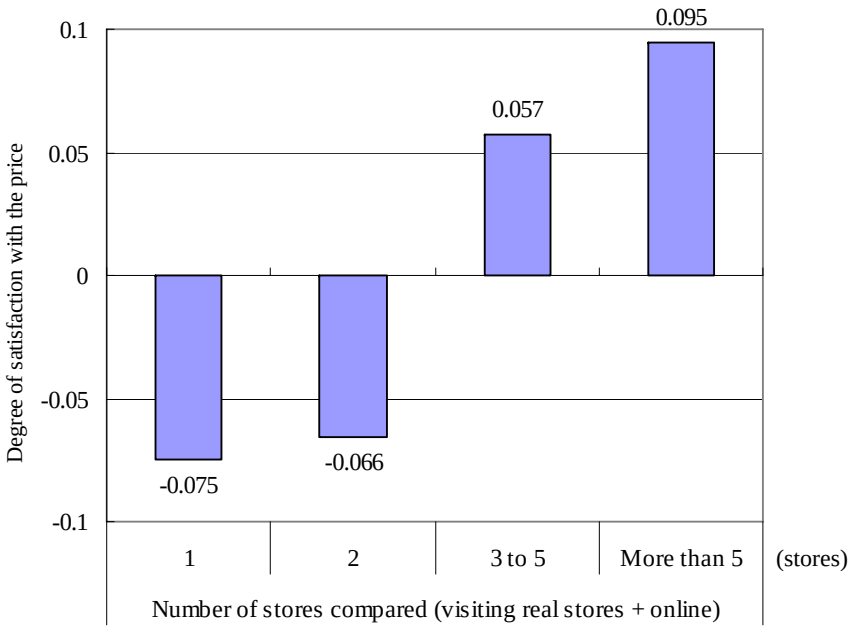
- **More than 60% of consumers use the Internet to collect information before buying a product. [Figure 22]**
- **As it becomes easier to compare various stores through the use of the Internet, information mismatching will be eliminated further, and customers will be able to gain higher satisfaction. [Figure 23]**

Figure 22: Means of Collecting Information before Shopping



Source: "Survey on the Use of ICT Networks by Consumers."

Figure 23: Relationship Between Price Satisfaction and the Number of Stores Compared (Difference from the Average)

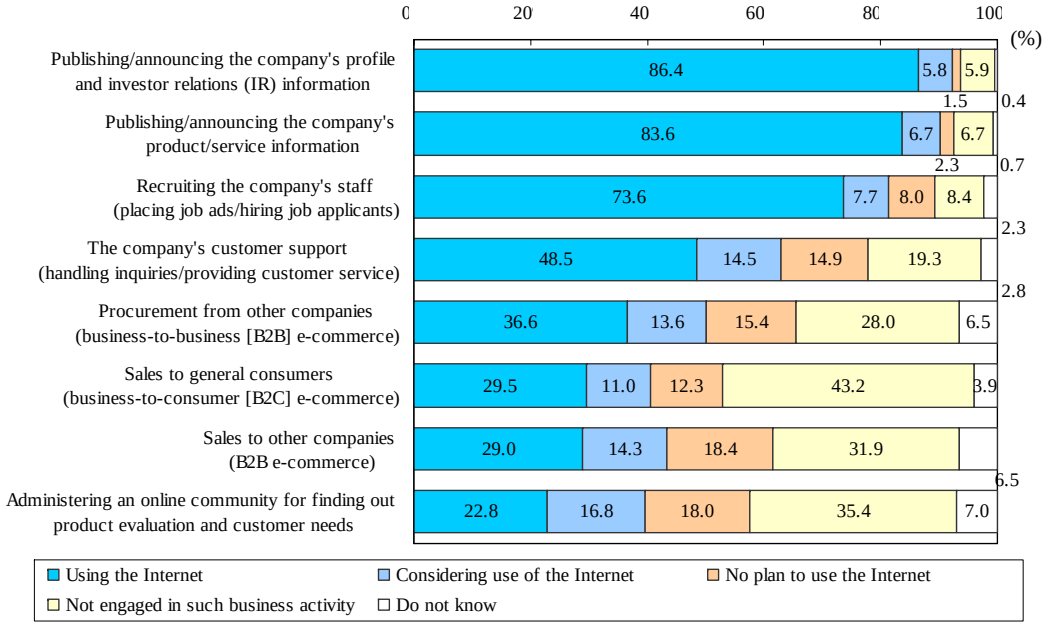


Source: "Survey on ICT and Buying Behavior."

7. New advertising strategies of businesses

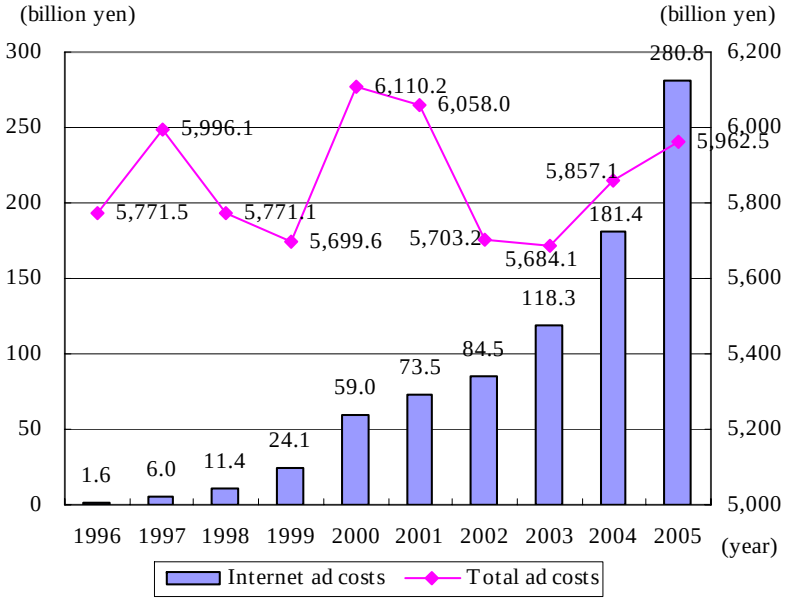
- **Many businesses use the Internet for advertising as a means to directly contact consumers. [Figure 24]**
  e.g., Internet ads, portal sites, search engines
- **Internet ads, which allow businesses to gain an understanding of individuals' preferences more accurately, are growing rapidly. [Figure 25]**
  : Surpassing radio ads in 2004.
- **Through effective marketing activities of businesses using Internet ads, portal sites, and search engines, the mismatching between information suppliers and information seekers will be eliminated, leading to higher user satisfaction and stronger business competitiveness.**

Figure 24: Use of the Internet by Type of Business Activity



Source: "Survey on the Use of ICT Network by Consumers."

Figure 25: Transition in Internet Ad Costs

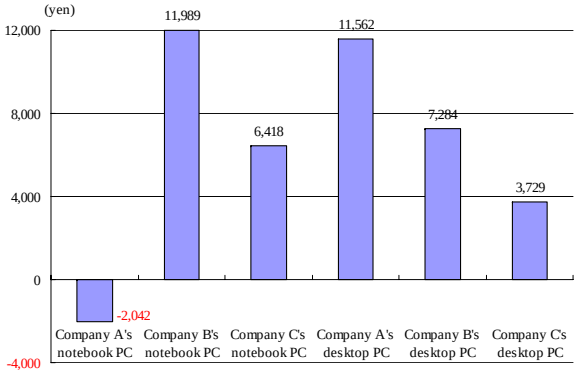


Produced from materials of Dentsu Inc.

8. Improvement in market efficiency

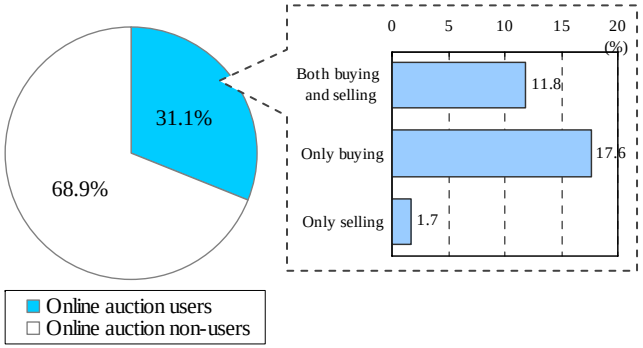
- **Internet transactions (e-commerce) contribute to increasing market efficiency by directly linking suppliers and consumers that are under geographical restrictions, reducing the uncertainties involved in information mismatching, and allowing production and transactions of diverse products.**
  - **; Online stores using price comparison sites or portal sites offer lower prices than real stores, suggesting that the market mechanism is functioning well. [Figure 26]**
  - **; B2C e-commerce market: 5.643 trillion yen (2004)**
- **Direct transactions between consumers (online auctions) are becoming active due to the progress in networking. [Figure 27]**
- **B2C e-commerce is the most active in the field of "books/CDs/DVDs" where the Long Tail phenomenon is observed. [Figure 28]**

Figure 26: Price Differences Between Online Stores and Real Stores



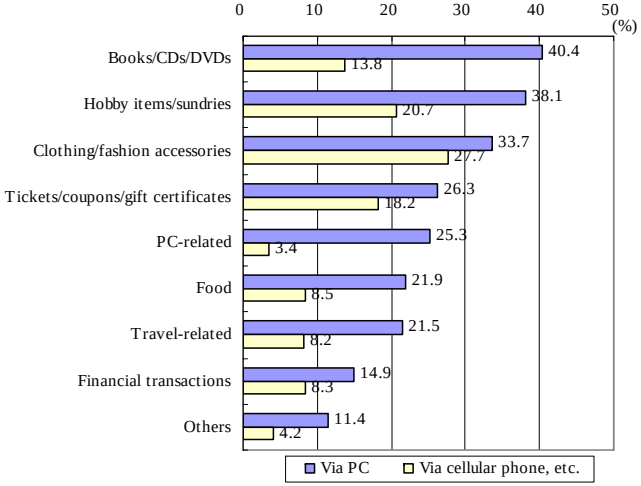
* Value obtained by subtracting online stores' average price from real stores' average price

Figure 27: State of Use of Online Auctions



Source: "Survey on the Use of ICT Network by Consumers."

Figure 28: Items Bought through Online Shopping



Source: "Communications Usage Trend Survey in 2005."

9. New developments in content distribution

- **While the size of the overall content market has remained more or less the same, the percentage of content distribution via the Internet (online-distributed content) has increased. [Figures 29 and 30]**
- **In the music distribution services market, which is rapidly growing due to the diffusion of mobile digital audio players (e.g., iPod) and the launch of music distribution to cellular phone handsets, users place importance not only on the "prelistening service" and "price," but also on a "large selection," suggesting that the creation of a market for the Long Tail part is supporting the market growth. [Figure 31]**

Figure 29: Current State of the Content Market

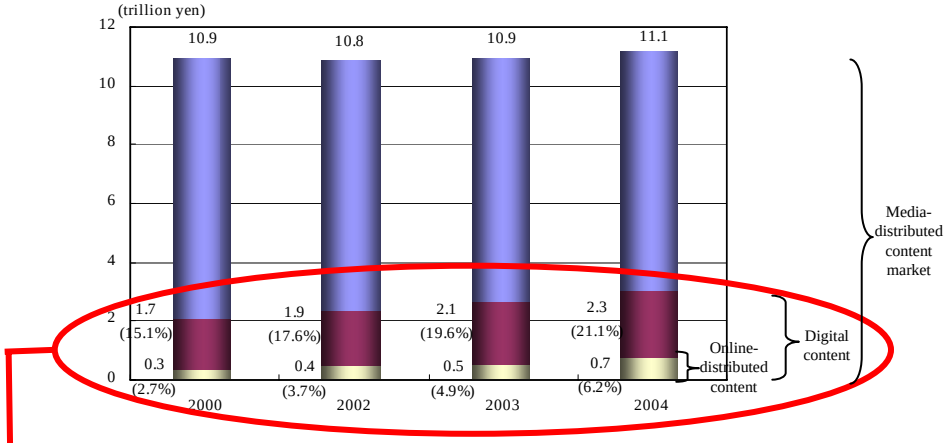
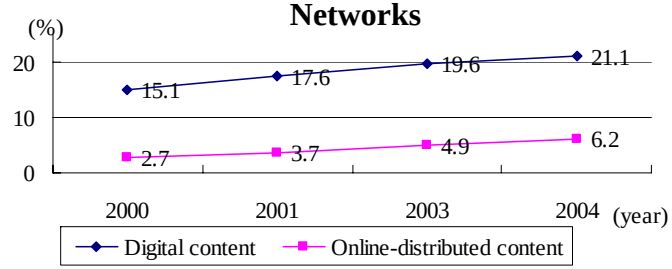
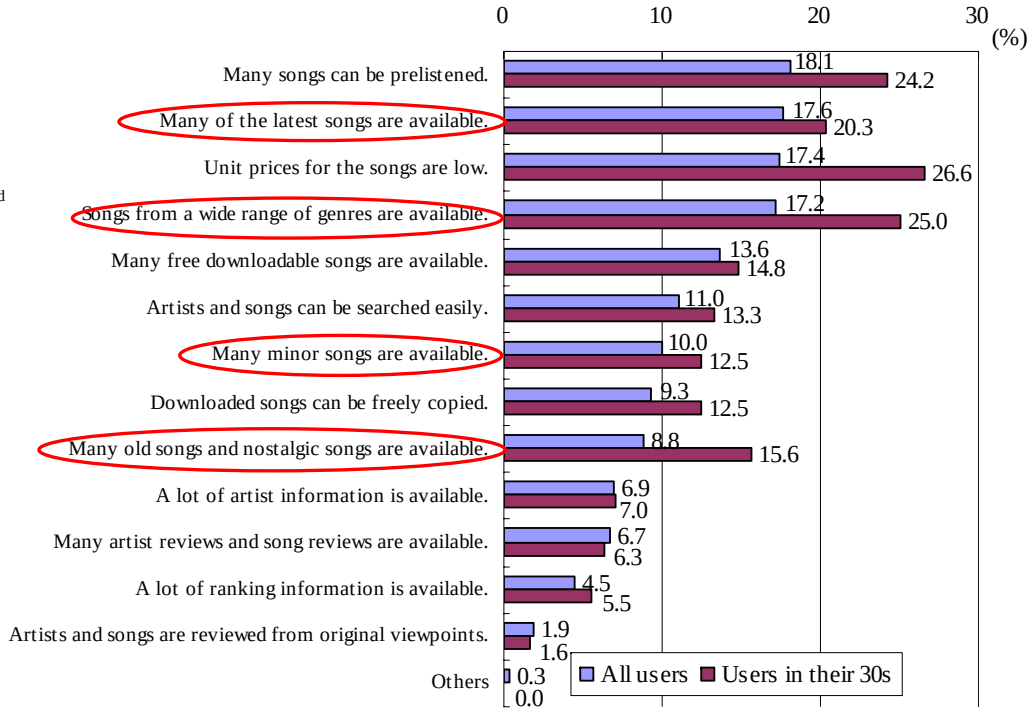


Figure 30: State of Distribution via Communications Networks



Source: Institute for Information and Communications Policy, Ministry of Internal Affairs and Communications (MIC), "Research Concerning the Current State of Production and Distribution of Media Contents."

Figure 31: Aspects Considered Important in Using Paid Music Distribution Services

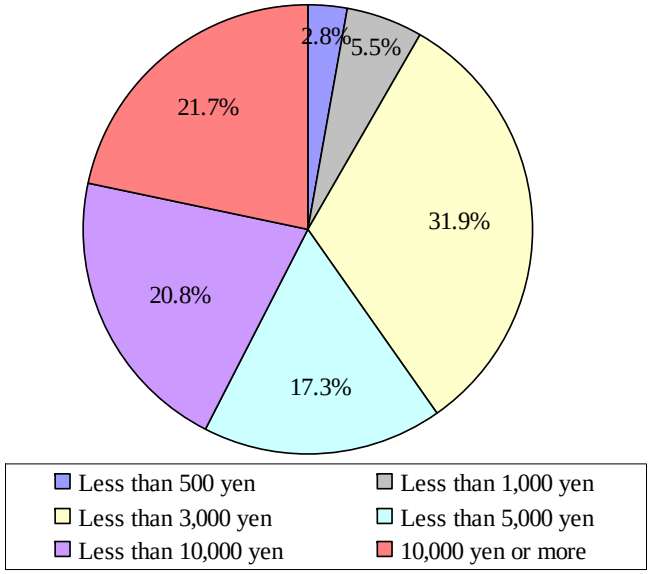


(Source: "Survey on State of Use of Ubiquitous Network-Related Goods."

10. Advancement in financial transactions through use of ICT networks

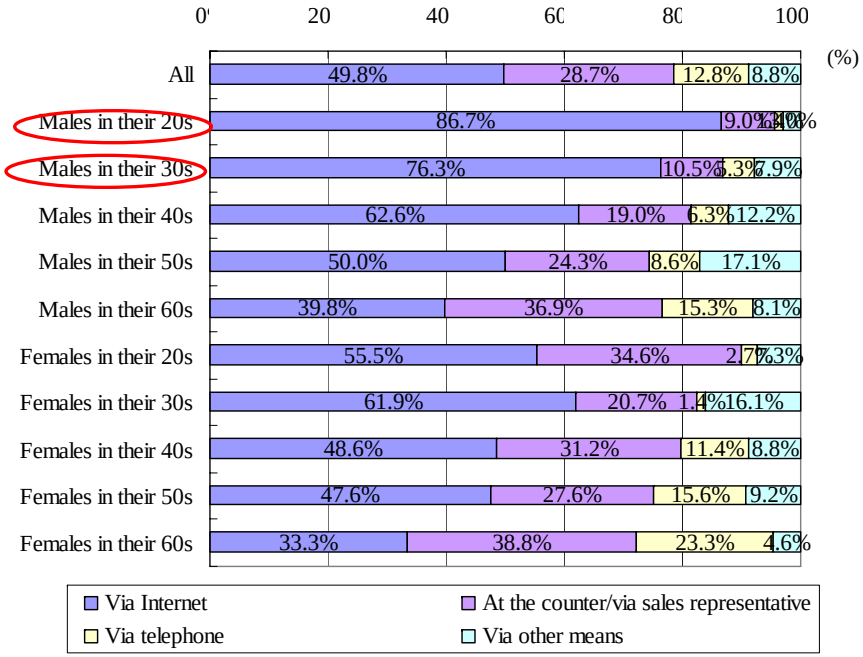
- **Electronic money, online banking, and online trading are rapidly diffusing as financial services that use ubiquitous network tools (smart cards, etc.) and take advantage of network characteristics. [Figure 32]**
- **Prepaid electronic money has diffused as a payment option, allowing users to use highly convenient financial services in their immediate environment at a low cost. In addition, online financial transactions including online trading and online banking are increasing mainly among young males. [Figure 33]**

Figure 32: Amount of Electronic Money Used (per Month)



Source: "Survey on the Use of ICT Network by Consumers."

Figure 33: Means of Securities Transactions

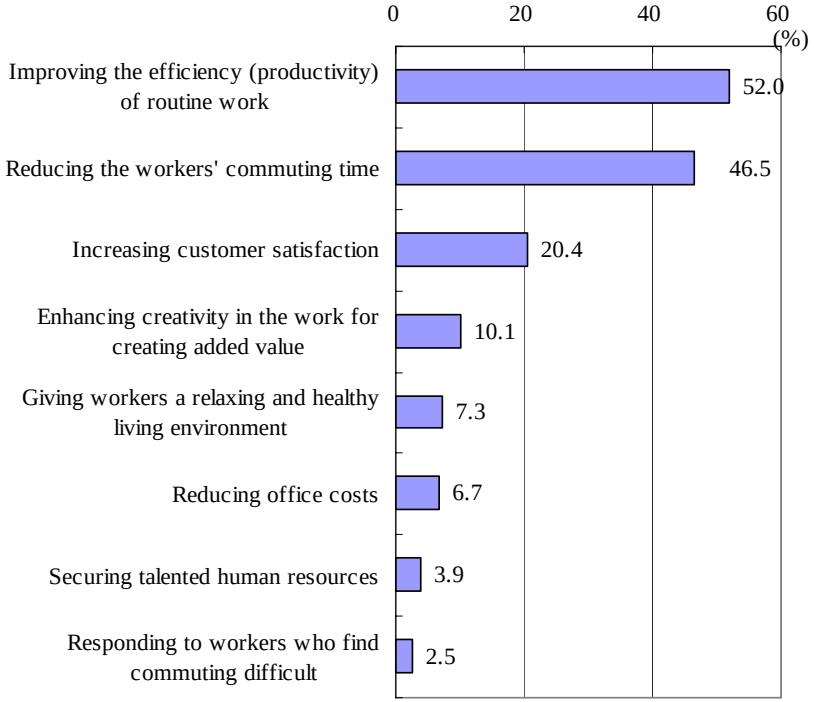


Source: "Survey on the Use of ICT Network by Consumers."

11. Impact on labor economy

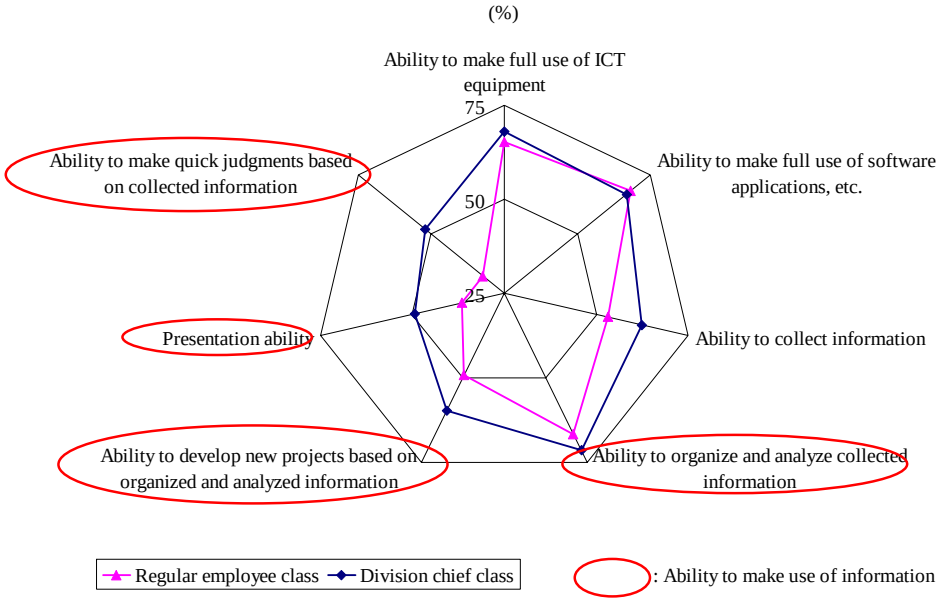
- **Telework, which provides access to a flexible work environment and diverse human resources, is expected to increase productivity through improving the efficiency of routine work. [Figure 34]**
- **As employers come to be required of higher ICT literacy with the increased introduction of ICT in businesses, there will be the following tendencies: the "ability to make use of information" will be required particularly among officers, and labor demand for non-routine work (demand for specialists that create originality and scarcity value) will increase. [Figure 35]**

Figure 34: Purpose for Introducing Telework



Source: "Communications Usage Trend Survey in 2005."

Figure 35: Abilities that Become Increasingly Important with Informatization (by Position)



Source: "Survey on State of Use of ICT by Workers."

12. Progress in use of ICT networks in businesses

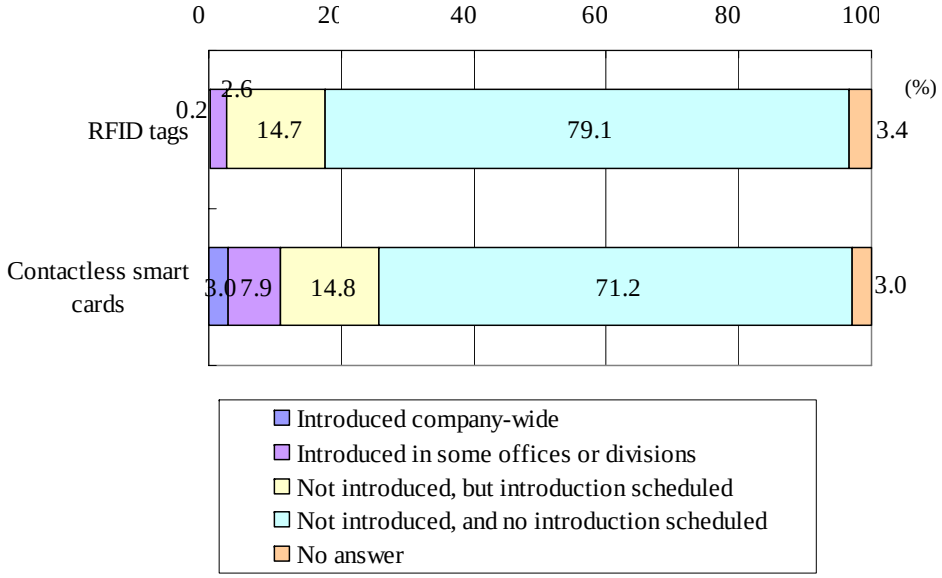
○ Ubiquitous network tools are mainly introduced in leading businesses at present. [Figure 36]

○ Introduction of ICT in businesses leads to increased productivity if conducted in line with organizational reform*. [Figure 37]

→This suggests the possibility that TFP improvements will also spread to industries other than ICT and electric machinery, and efficiency will increase on the macro level as well. [Figure 7 on p. 6]

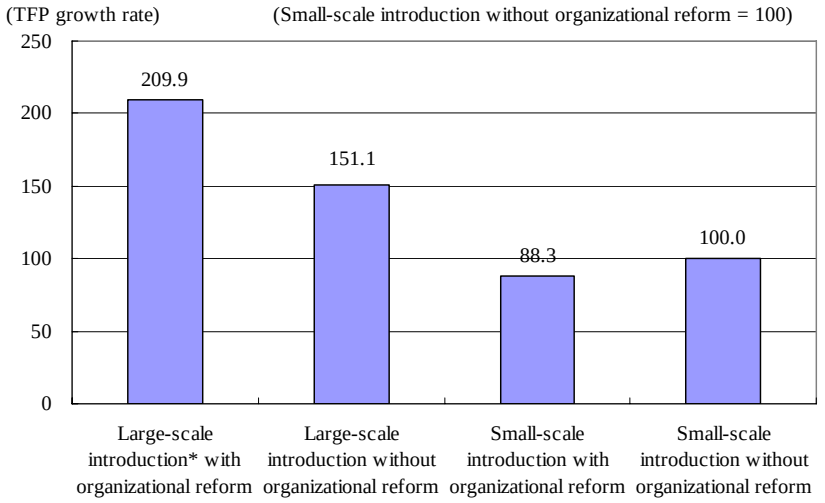
(* intangible assets)

Figure 36: State of Introduction of Ubiquitous Network Tools in Businesses



Source: "Communications Usage Trend Survey in 2005."

Figure 37: Relationship between Productivity and Introduction of Ubiquitous Network Technology/Organizational Reform of Businesses



* Introduction: introduction of ubiquitous network technology

Source: "Survey on the Use of ICT Networks by Businesses."

13. Challenges toward achieving a ubiquitous network society

- **Among the negative aspects of the development of ubiquitous networks, there are the problems of information security and the digital divide.**
- **Regarding information security, virus infection has become a social issue, and individuals as well as businesses face an urgent need to take countermeasures. [Figure 38]. Measures for protection of personal information by businesses have made progress, particularly in large companies, in response to the enforcement of the Act on the Protection of Personal Information.**
- **The gaps in Internet use among people of different attributes have been narrowing overall, but the gap is still notable between generations. [Figure 39] Also, there are still gaps in the availability of broadband services between regions. [Figure 40]**

Figure 38: Information Security Incidents Reported by Individuals

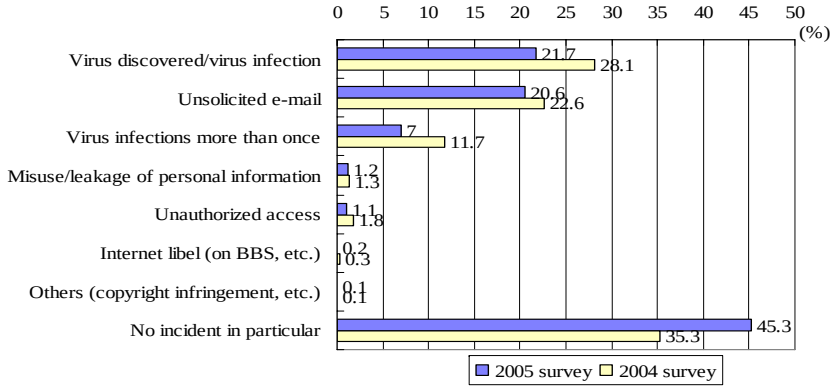
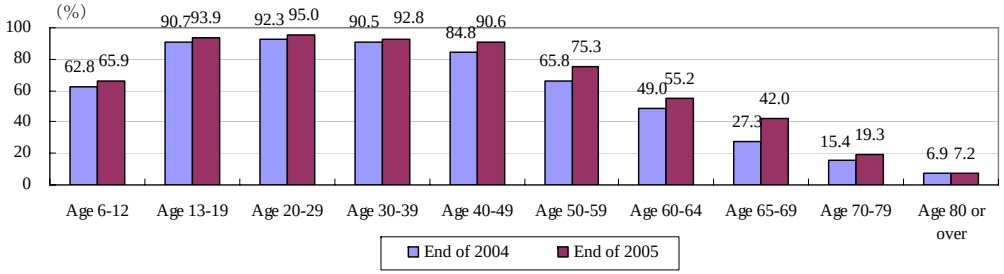


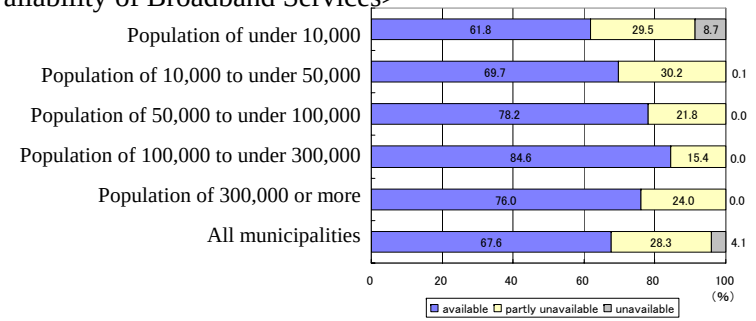
Figure 39: Use of the Internet by Age Group



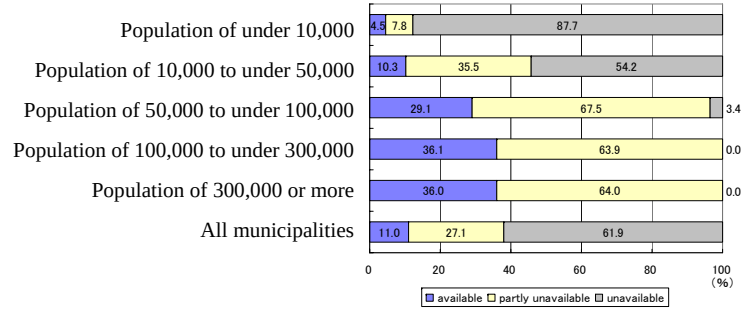
Source: "Communications Usage Trend Survey in 2005."

Figure 40: Availability of Broadband Services by Municipal Population

<Availability of Broadband Services>



<Availability of FTTH Services>



Produced from materials of MIC.

Excerpts from Information and Communications in Japan 2006

[Reference]

General Remarks: Ubiquitous Economy

1. Promotion of the u-Japan policy and transformation of the social and economic systems

Japan is expected to face various challenges associated with social life and economic activities due to changes in the social and economic environments including the declining and aging of the population. In order to overcome these challenges, efforts are required not only to streamline and improve the existing processes, but also to transform the social and economic systems into more diverse, creative, productive, and reliable systems.

Since the launch of the e-Japan Strategy in January 2001, intended for making Japan "the world's most advanced IT nation by 2005," infrastructure development has made steady progress and Japan has become to one of the most affordable and high-speed broadband environments. In July 2003, the e-Japan Strategy was reviewed. In this review, the focus was shifted to the promotion of IT use and the formation of a ubiquitous network society was positioned as the goal of the infrastructure development for a new IT society. In response to this, the Ministry of Internal Affairs and Communications formulated the u-Japan Policy in December 2004 aimed at achieving, by 2010, a ubiquitous network society—a society that allows connection to networks "anytime, anywhere, by anything and anyone," and enables easy exchange of information. The u-Japan Policy grew out of the conventional goal to catch up with other countries, and set a new goal to have Japan lead the world as a frontrunner in the field of information and communications technology , including the promotion of pioneering reforms of social systems by using ICT. Later, in January 2006, the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society decided on the New IT Reform Strategy for pursuing the potential of ICT to make structural reform, with the aim of "realizing a ubiquitous and universal network society where everyone can enjoy the benefits of IT."

Ubiquitous networks are ICT networks through which users can freely use network services, terminals, and digital content at any time and place without being aware of the presence of the networks. They are characterized by dramatically improved connectivity, allowing "person-to-person," "person-to-goods," and "goods-to-goods" communications at any place, realizing seamless and universal communications including the convergence of fixed-line and mobile communications. A ubiquitous network society has the potential of integrating scattered social components via the networks, because ICT will penetrate all scenes of social and economic activities. Thus, increased use of ubiquitous networks is expected to promote the accumulation of knowledge and technology, and contribute to transforming the existing social and economic systems and accelerating technological progress.

Excerpts from Information and Communications in Japan 2006

[Reference]

General Remarks: Ubiquitous Economy

2. Social and economic characteristics brought about by development of ubiquitous networks

In the past, ICT was mainly used by businesses; consumers usually enjoyed the convenience of ICT in a passive manner. However, the significance of ubiquitous networks is in spreading such benefits of ICT, to consumers. This is symbolized by the progress of cellular phone, the diffusion of RFID, distribution of digital content on broadband networks, and the rise of consumer-generated media, CGM, such as blogs and social networking services, SNS.

ICT use in businesses has expanded from accounting procedures to order and inventory management, and further to customer management. The use of ICT has improved the operations for businesses, and as well, has increased convenience for consumers. Actual examples include ATMs for withdrawing money from any bank, and call centers that efficiently respond to inquiries from consumers by instantly searching the consumer's profile in their database. In these cases, however, ICT is being actively used by businesses, and consumers are in a position to enjoy the conventional types of benefits in a more convenient manner. In the consumer's eye, such a change only means more efficient and cheaper access to conventional services, and does not mean an essential change in their lifestyle.

Nevertheless, in recent years, ICT use has widely diffused, not only throughout businesses, but also throughout consumers. For instance, selling items through online auctions via cellular phones, viewing video content via broadband services, and exercising influence on society by sending out information freely and actively through blogs and SNS, they are new types of uses that involve changes in lifestyles. While these changes in lifestyles create new markets and employment opportunities, the existing markets will be restructured, and this will press businesses to adapt to these new market environment. This is the reason that we have chosen to use the term "ubiquitous economy" to express the social and economic characteristics brought about by the development of ubiquitous networks.

Excerpts from Information and Communications in Japan 2006

[Reference]

General Remarks: Ubiquitous Economy

3. Viewpoints of studying the ubiquitous economy

This white paper features "ubiquitous economy"—the social and economic characteristics brought about by the development of ubiquitous networks in achieving a ubiquitous network society by 2010. It studies the mechanism by which the spread of ICT use will diversify the uses of ICT, such as increased fusion/collaboration between communications and broadcasting, new trends including Web 2.0, and the development of consumer-generated media such as blogs, transform social and economic systems, and create economic vitality. The study is made from the viewpoints mentioned in (1) and (2) below.

(1) Economic performance toward achieving a ubiquitous network society

The current situation of ICT industries suggests that, although the industries experienced a business recession with the collapse of the ICT bubble economy, the process of "creative destruction" based on technological innovations in the ICT field, including emergence of new businesses using the Internet, is still alive. Indeed, activities in the ICT industries have been gradually boosting their resilience due to recovery in the ICT manufacturing industry. In addition, ICT has made considerable and favorable contributions to the changes in real GDP.

At the same time, ICT use has also been spreading among individuals and households with the development of ubiquitous networks, but obvious improvements in productivity have yet to be observed on the macro level. For example, although ICT investment and capital stock have been increasing in Japanese industries, the figures for total factor productivity, TFP, of various industries show that improvements have not become quite evident, except in ICT industries and electric machinery industries. Impacts of ubiquitous networks are expected to emerge in the following micro-level social and economic activities first, rather than in the macro level.

Excerpts from Information and Communications in Japan 2006

[Reference]

General Remarks: Ubiquitous Economy

(2) Impact of ubiquitous networks on social and economic activities

Unlike in the 1990s when ICT were introduced mainly in businesses and industries, ICT will make their way into all fields, including individuals and households in a ubiquitous network society. This may have great impacts on the social and economic activities and mutual relationships of various entities, such as creating unconventional direct contact points between businesses and individuals or between suppliers and consumers, and generating new mutual relationships, as well as integrating the diverse knowledge scattered among various entities in society.

Therefore, this white paper conducts study from the following three viewpoints.

(i) Achievement of diverse information distribution societies

User needs are expected to expand with the advancement of fusion between communications and broadcasting. Also, the Long Tail phenomenon, achieving sales of products with low and diverse demand will emerge in network transactions between suppliers and consumers due to new trends including Web 2.0, which will cultivate the niche markets and satisfy diverse user needs. Furthermore, with the rise of CGM such as blogs and SNS, knowledge and various opinions will be increasingly provided or returned to society as all types of entities will become able to send out information at a low cost.

(ii) Elimination of information mismatching

With the decrease in users' information search costs due to the development of Internet personal ads, portal sites, and search engines, as well as the implementation of effective marketing by businesses using these tools, the mismatching between information suppliers and information seekers will be eliminated. This is expected to contribute to greater user satisfaction, stronger business competitiveness, more efficient markets, and globalized transactions.

(iii) Improvement in productivity and human capital

As observed from open-source efforts, the development of a networked environment has the potential for facilitating knowledge accumulation and knowledge-based collaborations, and improving the ability to acquire knowledge in the entire society.

In addition, a diverse labor supply is expected to become available in the labor market through flexible working environments including telework. Furthermore, in line with the increased use of ICT in businesses, emphasis will be placed on knowledge and human resources as the source of a competitive edge, and labor demand will increase for specialists who can create originality and scarcity value. Such increased focus on specialists will promote the concentration of management resources in core operations, and increase outsourcing.

Excerpts from Information and Communications in Japan 2006

[Reference]

General Remarks: Ubiquitous Economy

4. Structure of this paper

Based on this problem awareness, this paper consists of the following three chapters.

Chapter 1 investigates and analyzes ubiquitous economy, which is the feature of this paper, and reports the results. First, Section 1 indicates the trends in ICT industries, looking at economic activity toward achieving a ubiquitous network society, and studies the impact of the increase in ICT investment and capital stock on the macroeconomy and industrial productivity. Then, Section 2 to Section 6 discuss the impact of ubiquitous networks on social and economic activities, mainly from the consumers' viewpoint, while Section 7 to Section 12 discuss such impact mainly from the business and market viewpoint. Furthermore, Section 13 takes a look at information security and the digital divide as the negative aspects of the development in ubiquitous networks.

Chapter 2 investigates and analyzes the current state of ICT industries supporting a ubiquitous economy.

Chapter 3 summarizes the basic trends in the ICT policies.

Since it is important that the ubiquitous network society to be achieved by 2010 should greatly contribute to the development of Japanese society and economy, this white paper aims to provide useful material for developing various measures for achieving this goal.