〔Unofficial Translation〕

White Paper 2002
Information and Communications in Japan (Summary)

July 2002
Ministry of Public Management, Home Affairs, Posts and Telecommunications

Contents

Thesis of "Stirring of IT-Prevalent Society," Feature of White Paper 2002

Penetration of the Information and communications

(1) Number of Internet users has increased to 55.93 million (second in the world) (as of the end of December 2001).

(2) Number of subscribers to broadband circuits stands at 3.869 million (as of the end of March 2002).

Current State of the Use of Information and Communications and Issues for the Future

Businesses

IT investments finished the basic infrastructure stage, with some investments pushing into such areas; as cost reductions and new market development.

(1) Investments in basic infrastructure ⇒ nearly universal, with over 90% of companies making these investments (PCs for workers, LANs, groupware, etc.).

(2) Investments to reduce costs ⇒ Many companies (40%-70%) make these investments (accounting and personnel systems, enterprise resource planning, and other sales support systems).

(3) Investments to open up new markets ⇒ Some companies (20%-40%) make these investments (Electronic commerce, customer relations management, and other sales related systems).

◇ **Issues for the Future**

Companies understand that it is necessary to reengineer business and organizational systems along with IT investments.

Local Government

While the digitalization within local governments and the development of Web sites is progressing well, digitization aimed at local residents such as the digitization of administrative procedures involving applications, notices, and other such items, will need to be developed going forward.

(1) In a self-assessment with respect to digitization within public agencies and the development of Web sites, it was found that 40-60% of local governments are satisfied with their progress.

(2) At present, work is underway at implementing such IT systems as electronization of applications and reporting for the populous.

◇ **Issues for the Future**

(1) The local governmental bodies understand the importance of addressing issues such as cost reductions and human resource development in order to bring about e-government.

(2) It is important to assess the needs of the populous in order to promote e-government building upon the current circumstances in the local governmental bodies.

Individual

(1) 66% of users regard the Internet as "indispensable."

(2) Expansion in Usage Range

Conventional usage focused on e-mail and information gathering

⇒ Usage for on-line shopping and auctions has increased.

⇒ Active use of on-line games, motion picture viewing, and e-learning, which are well-suited to broadband, is still in the future.

◇ **Issues for the Future**

(1) The digital divide between different demographic groups and geographical areas remains to be solved.

(2) Diffusion of broadband is essential for expanding applications to the next level.

Cross-sectional Issue

Distribution of Appealing Content

(1) Over the past three years, transmission of content over the Internet has increased 6.7-fold

(2) Internet users have concerns/complaints that "the transmission speed is slow" (55%), "personal information might be leaked" (50%), and "payment processes might not be correct" (45%), where these concerns/complaints must be resolved in the content business to be successful.

Data Security

Antivirus software and measures such as firewalls are nearly in place.

⇒ Less than 40% of corporations have security policies in place or are performing security audits, etc.

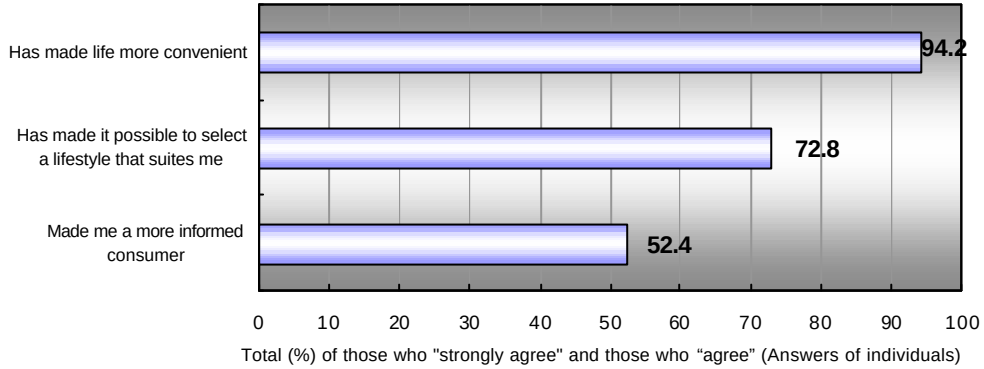
◇ **Research and Development**

Use of the Internet in the future will shift to non-PC devices and become more ubiquitous.

⇒ It is important to promote research and development of mobile terminal technologies, intelligent home appliances, and human interface technologies, in which Japan is particularly strong.

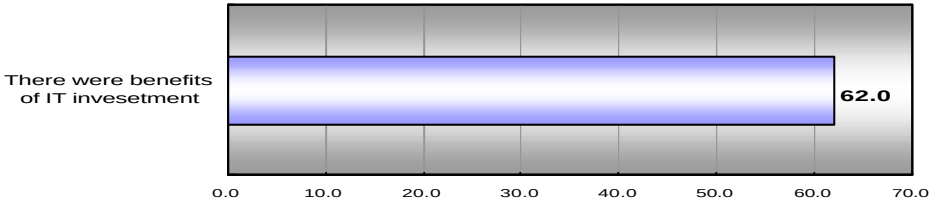
Evaluation of Degree of IT Utilization

Lives of Individuals



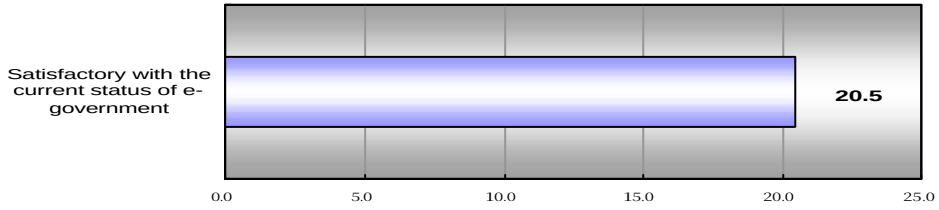
Total (%) of those who "strongly agree" and those who "agree" (Answers of individuals)

Business Activity



Total (%) of those who answered "there were benefits in excess of the investment cost" and those who answered "there were benefits commensurate with the costs" (Answers of businesses)

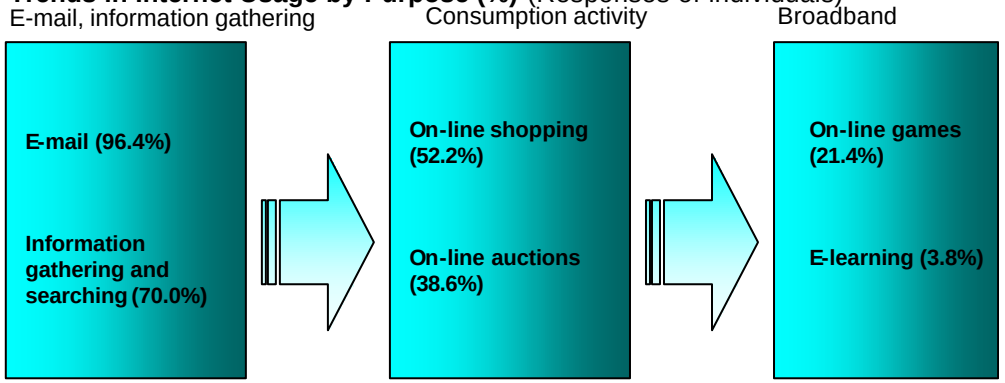
Local governments



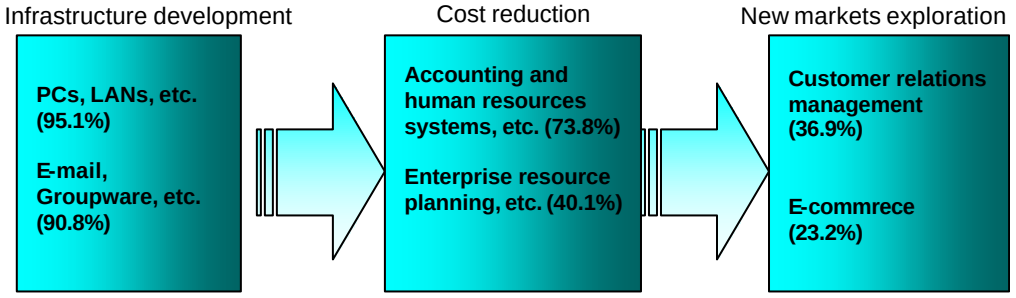
Total (%) of those who answered "very satisfactory" and those who answered "somewhat satisfactory" (Self-evaluation by local governments)

Increases in the Degree of IT Utilization

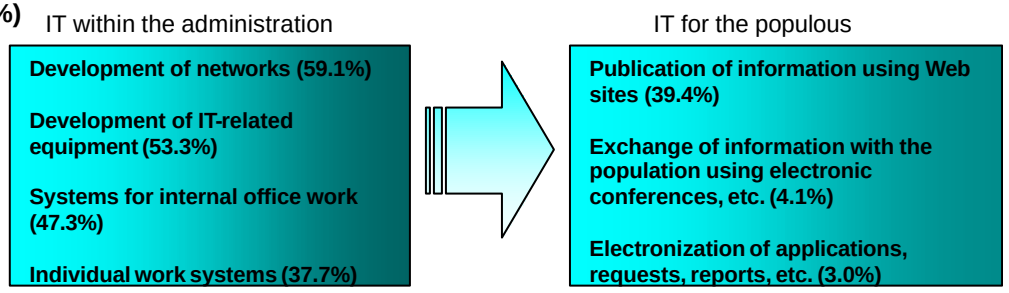
Trends in Internet Usage by Purpose (%) (Responses of individuals)



Proportion of Companies That Have Made Investments in IT (%) (Answers of businesses)



Local Governments' Self-Evaluation of the Current Status of E-Municipalities (%)



Reference: Methods of Publication

- **Publications (color printing, A4 size)**
  - **Japanese version (complete, with CD-ROM) and English version (summary only)**
- **Web site of Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT)**
  - **Japanese version (complete) and English version (summary only) (Available in PDF file format* as well.)**
  - **White Paper for Kids: *Information and Communications in Japan White Paper 2002***
  - **Mobile Version of *Information and Communications in Japan White Paper 2002***
- **After the White Paper has been published, site links with the latest data can be provided on the Web site of the MPHPT to make it possible to receive updated data after publication.**

* PDF (Portable Document Format)
A file format often used when publishing documents on the Internet. It allows users to view and print the documents in the same style and layout as the ordinary publication.

Feature:

Stirring of the IT-prevalent Society

Key Data

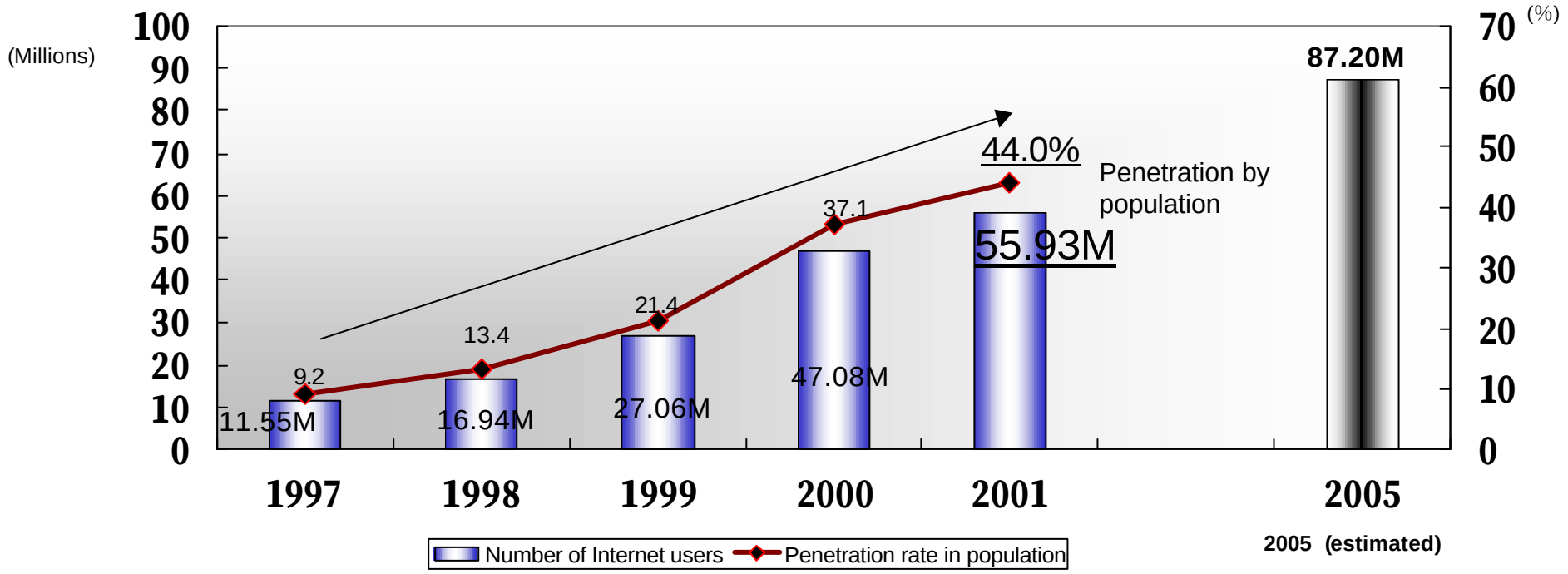
1. Popularization of the Internet in Japan

(1) Trends in Internet Usage (2001)

◇ **The Internet is steadily increasing its penetration.**

- The number of Internet users has reached 55.93 million, up 8.85 million from the previous year.
- The penetration rate (in terms of populous) has reached 44.0%, up 6.9 points from the previous year.

Trends in the Number of Internet Users and the Penetration Rate



* The number of Internet users above includes access through mobile telephones, PHS, etc.

* The number of Internet users in 2001 is based on a mail-in questionnaire survey to heads of households (querying the head of the household whether or not the Internet is use in the family) to calculate the number of Internet users aged 6 and above and to calculate the penetration rate in the population. (Until the year 2000, the figures were based on the results of mail-in questionnaire surveys sent to individuals, where the number of Internet users between the ages of 15 and 79 were tallied and penetration in population was calculated, and so the results from this year cannot be compared directly from last year.) The estimation for the future is from the *Information and Communications in Japan White Paper 2001*.

Source: *Communications Usage Survey,* MPHPT (Dec. 2001)

(2) International Comparison of the Internet Usage Rate

◇ **Japan's Internet penetration rate (by population) ranks 16th worldwide, while its total number of users ranks second worldwide.**

- Japan's penetration rate, at 44.0%, is 16th worldwide. (Fig. 1)
- On the other hand, the 55.93 million users in Japan is second worldwide, next to U.S.A. (Fig 2)

Fig. 1: Internet Penetration Rates in Population in Countries and Territories with Rates of at Least 35%

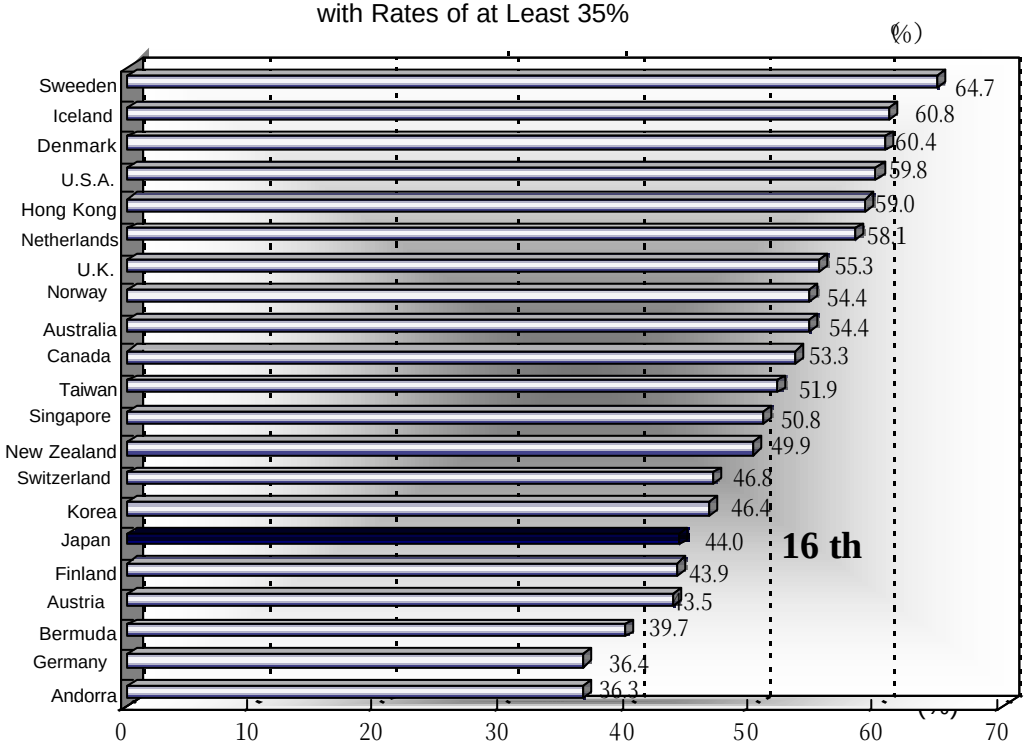
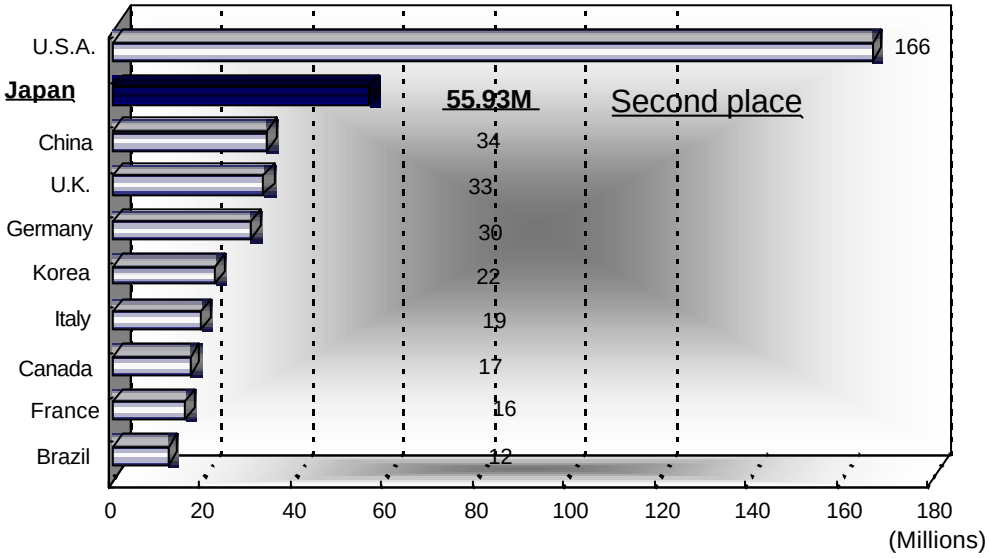


Fig. 2: Top 10 Countries in Terms of Number of Internet Users



* NUA gathers data from the investigation agencies of the various countries. Comparisons should be made bearing in mind that the data from different countries are data for different times, and have been gathered different methods.

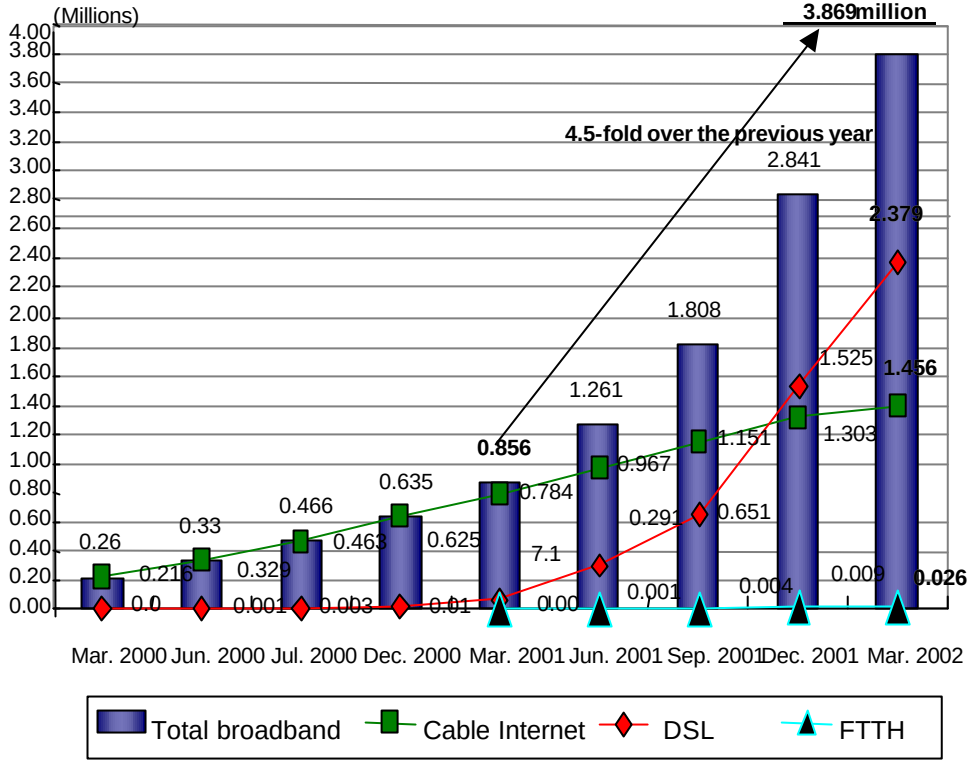
Source: Publicly available data from Nua.com (except for Japan) as of March 2002

(3) Penetration of Broadband Network (Fiscal 2001)

◇ **Broadband penetration is increasing rapidly.**

- Driven by DSL, the number of broadband subscribers is increasing rapidly, reaching 3,869,000 as of the end of March 2002, a 4.5-fold increase over the previous year.

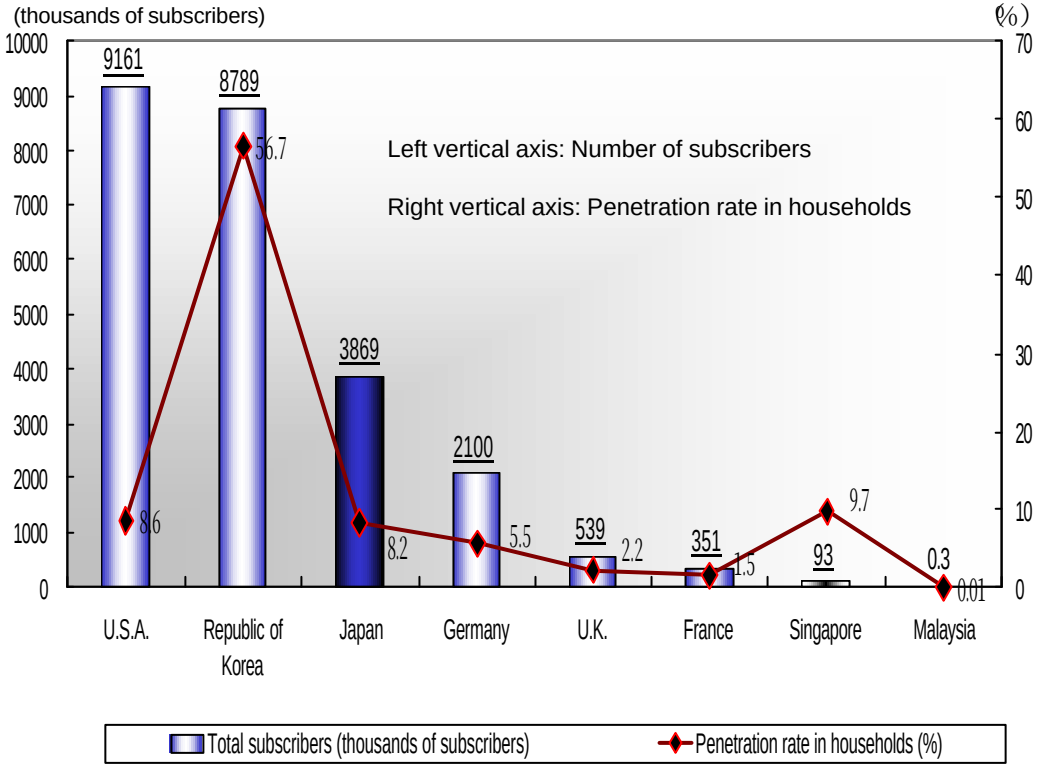
Fig. 1: Trends in the Number of Subscribers to Broadband Networks



Source: MPHPT Survey

Note: "Total Broadband" includes: ADSL, cable Internet, FTTH and FWA

Fig. 2: State of the Penetration of Broadband Access in the Major Countries



Note: Fig. 2 has been compiled on the basis of official data released by a research institution in each country, and as such the timing and method of the survey varies from one country to another. For this reason, the above comparison should be used strictly for reference purposes only.

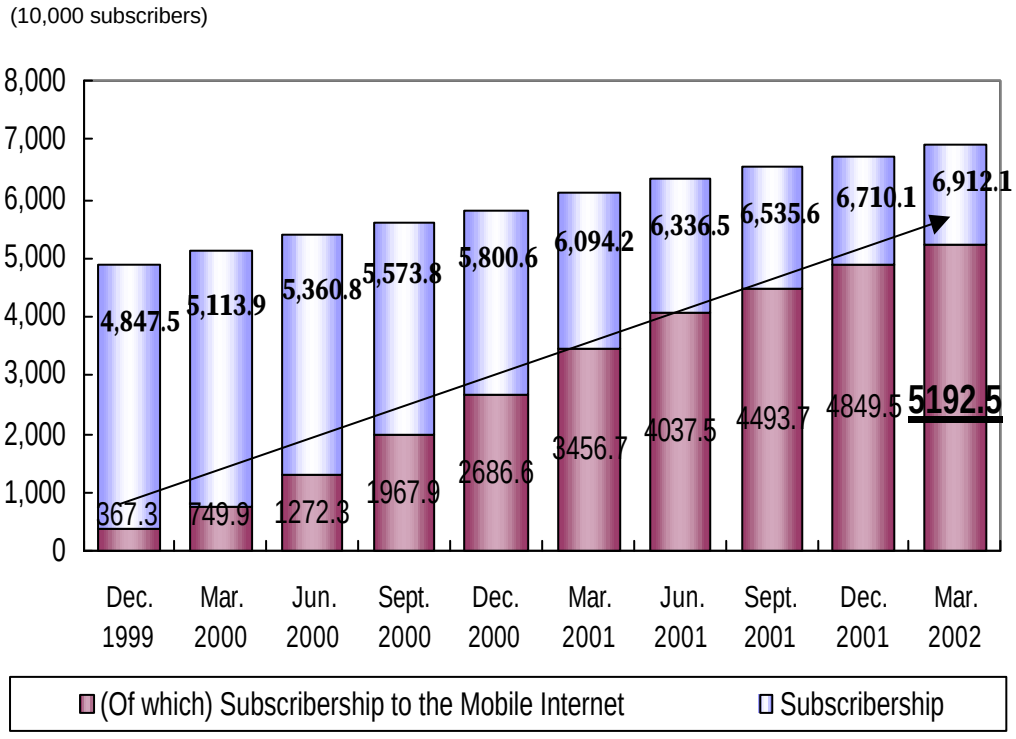
Source: MPMPT Survey

(5) State of the Penetration of the Mobile Internet

◇ World leader in the penetration of the Mobile Internet.

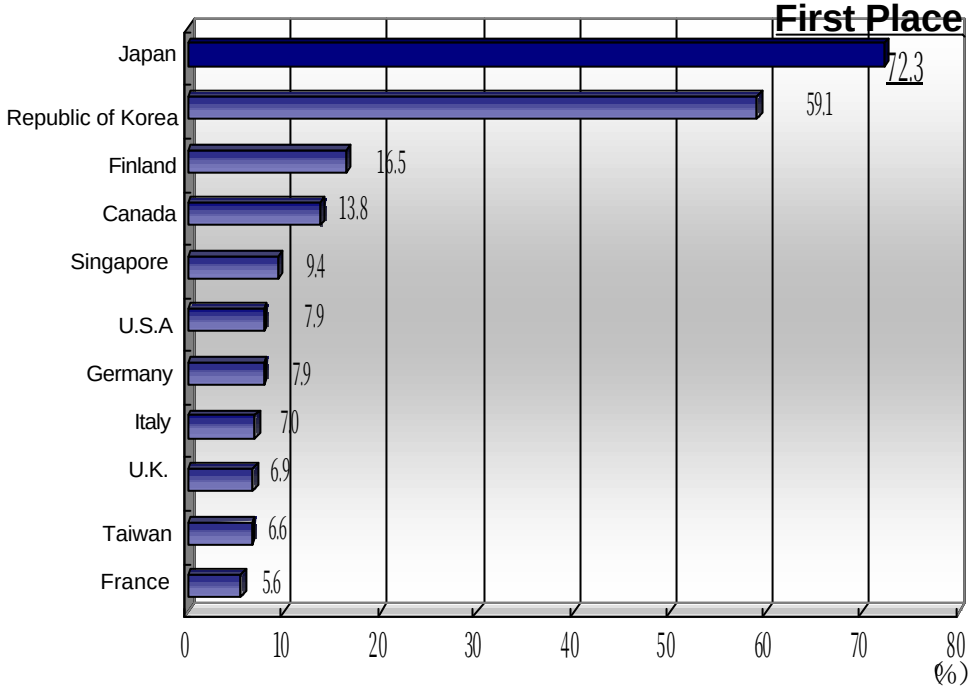
- The number of subscribers to the Mobile Internet has experienced rapid growth in just 3 years, up to 51.93 million subscribers (Commenced services in February, 1999) (Fig. 1).
- In a comparison with other countries in the world, Japan ranks first in the ratio of cell phones being used as Internet terminals (Fig. 2).

Fig. 1: Trends in the Number of Subscriptions to Cell Phones and the Mobile Internet



Source: MPHPT

Fig. 2: Cell Phone Internet Compatibility Rate (Ratio of the Number of Subscribers to the Mobile Internet to the Number of Subscribers to Cell Phones) in the Major Countries and Regions



Compiled by MPHPT based on data from Baskerville Communications Corporation (as of the end of 2001)

(5) Launch of the Third-Generation Cell phone

◇ **In connection with the third-generation cell phone that was the first of its kind launched in the world in October, 2001(approximately 90,000 subscribers as of the end of March, 2002)**,

- Its most desired function and service is “a faster communication speed” (46.4%), followed by “a TV telephone function” (30.9%) (Fig.1).
- Largest impediment to subscription to the third-generation cell phone is that “communication charges are expensive” (78.8%) and “cost of device terminal is expensive” (74.1%) (Fig. 2).

Fig. 1: Desired Functions and Services in Third-Generation Cell Phone

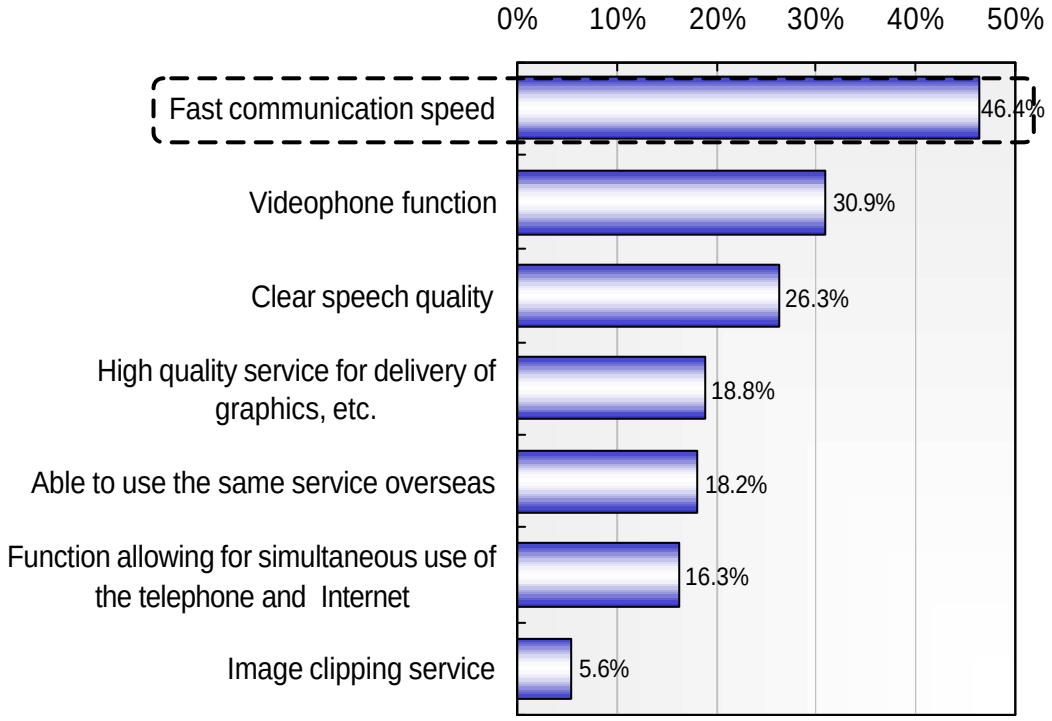


Fig. 2: Items that are Impediments to Subscription to the Third-Generation Cell Phone (multiple answers)

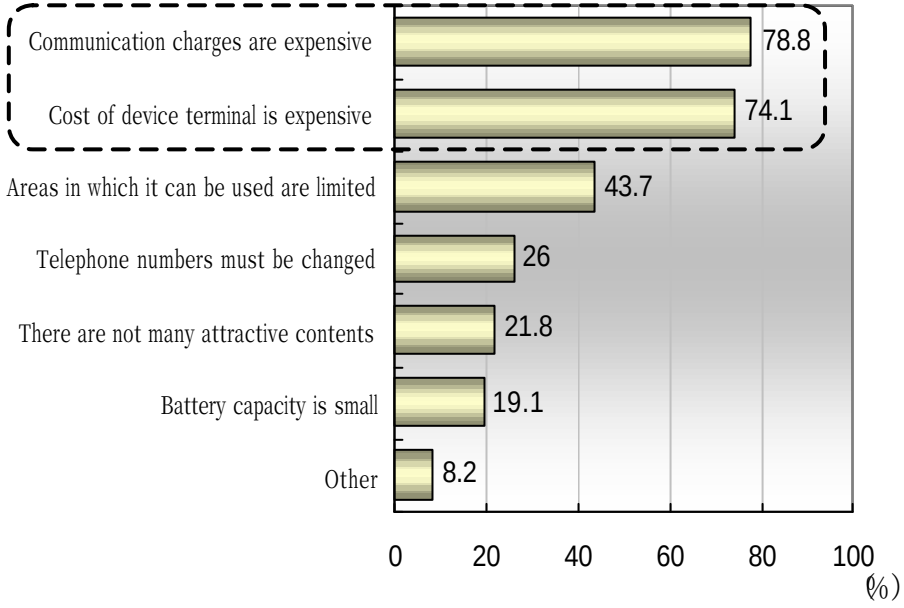


Fig.1, 2 Source: Survey and Analyses of IT and National Life, MPHPT

2. Use of IT by Businesses (IT Investment)

(1) Trends in IT Investments in Japan as a Whole

◇ **Corporate IT investment has been active, even given the dismal economic conditions in the 1990s after the bursting of the economic bubble.**

- The flow of investment in IT by the private sector is increasing steadily at 20.8 trillion yen in 2000, accounting for about a quarter (23.5%) of private-sector capital investment in 2000. (Fig. 1)
- IT capital stock in the private sector is also increasing steadily at 44.0 trillion yen in 2000. The ratio of private sector capital stock is also increasing, at 4.0% in the year 2000 (Fig. 2)

Active Corporate Investment in IT

Fig. 1: IT Investment in Japan

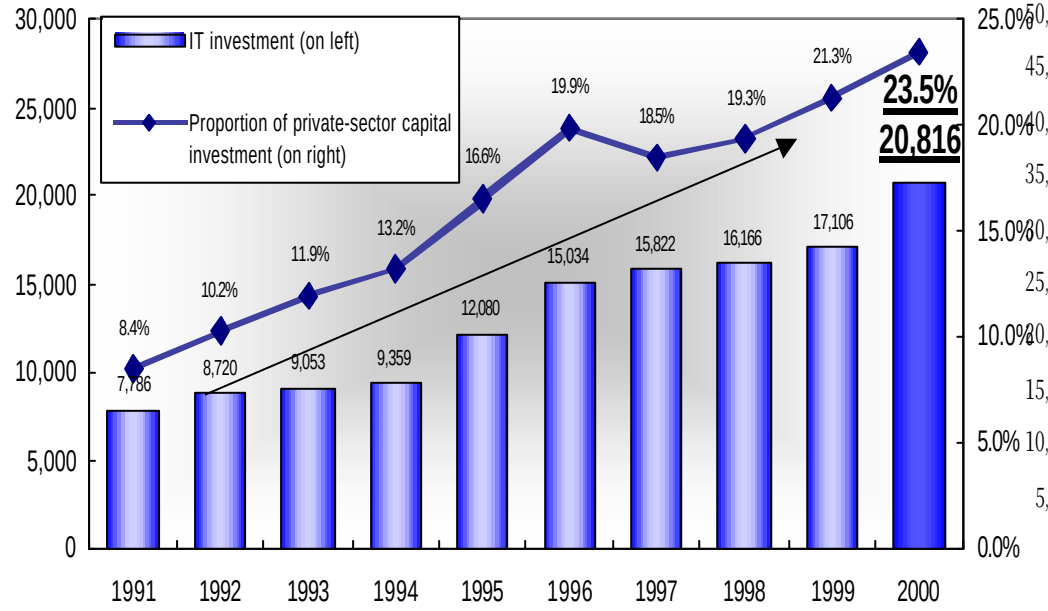
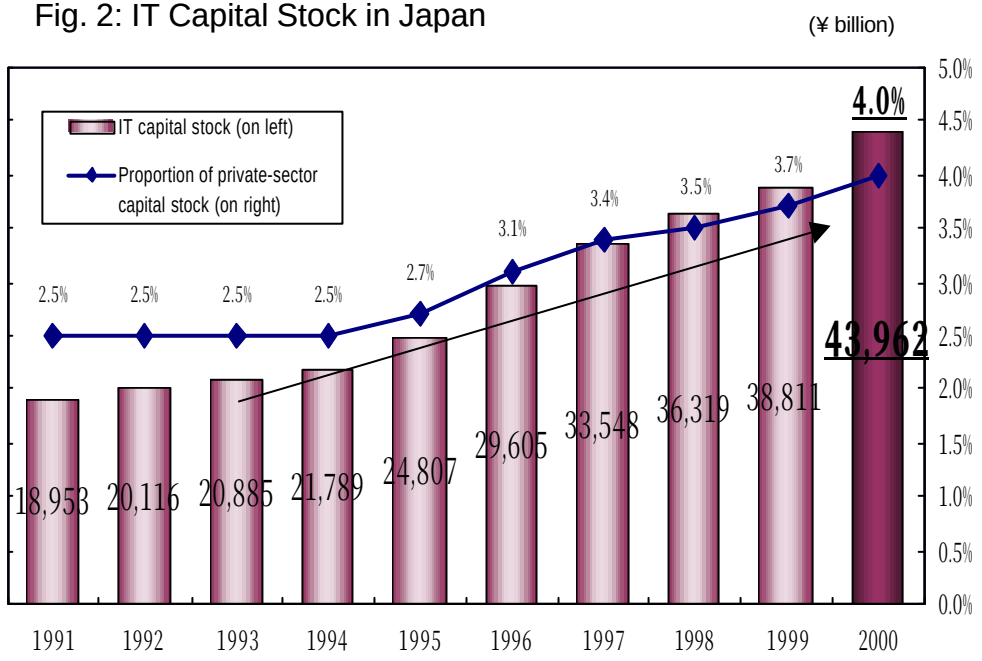


Fig. 2: IT Capital Stock in Japan



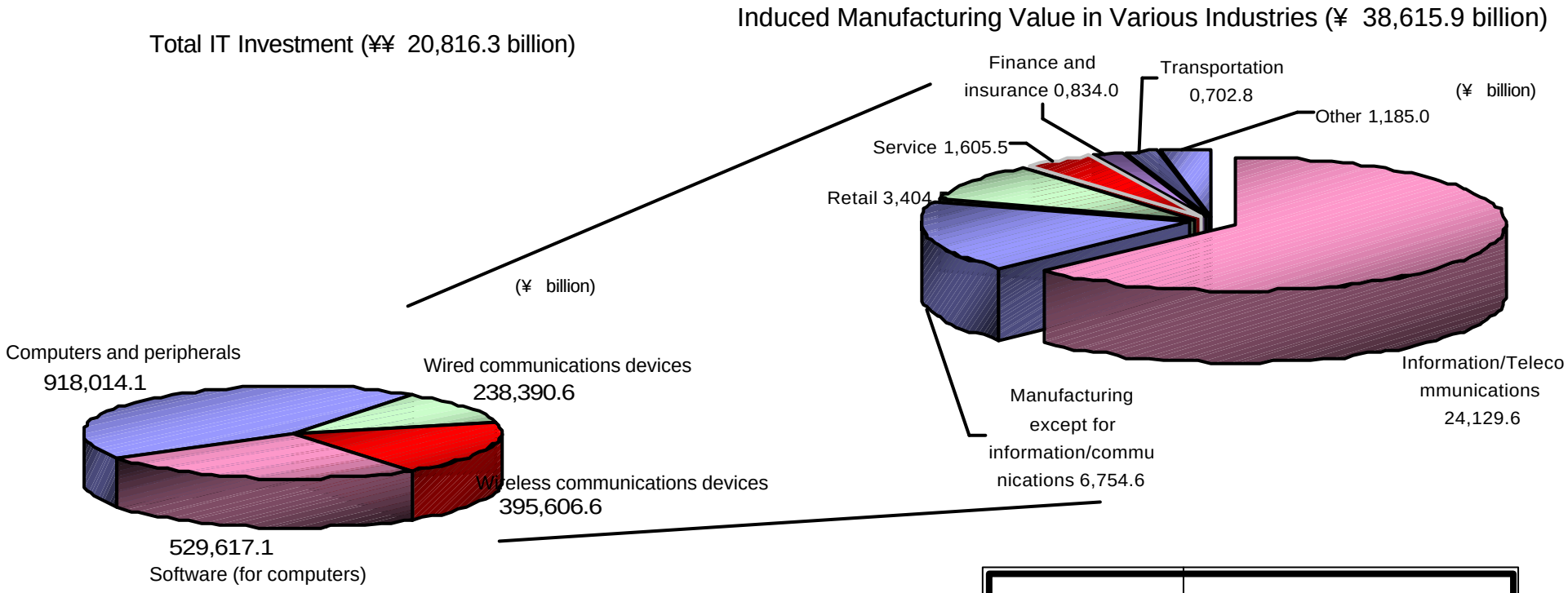
Note: IT investment is defined as investments in "computers and peripherals," "wired electronic communications equipment," "wireless electronic communications equipment," and "software."

Source: *Survey of IT Economic Analyses*, MPHPT

(2) Economic Ripple Effect of IT Investments

◇ **IT investments have a large ripple effect on a variety of industries.**

- IT investments of 20.8 trillion yen created 38.6 trillion yen economic ripple effect in 2000.



Total induced manufacturing value	¥ 38,615,946 million
Total induced GDP value	¥ 17,538,668 million
Job creation	1,486,636 jobs

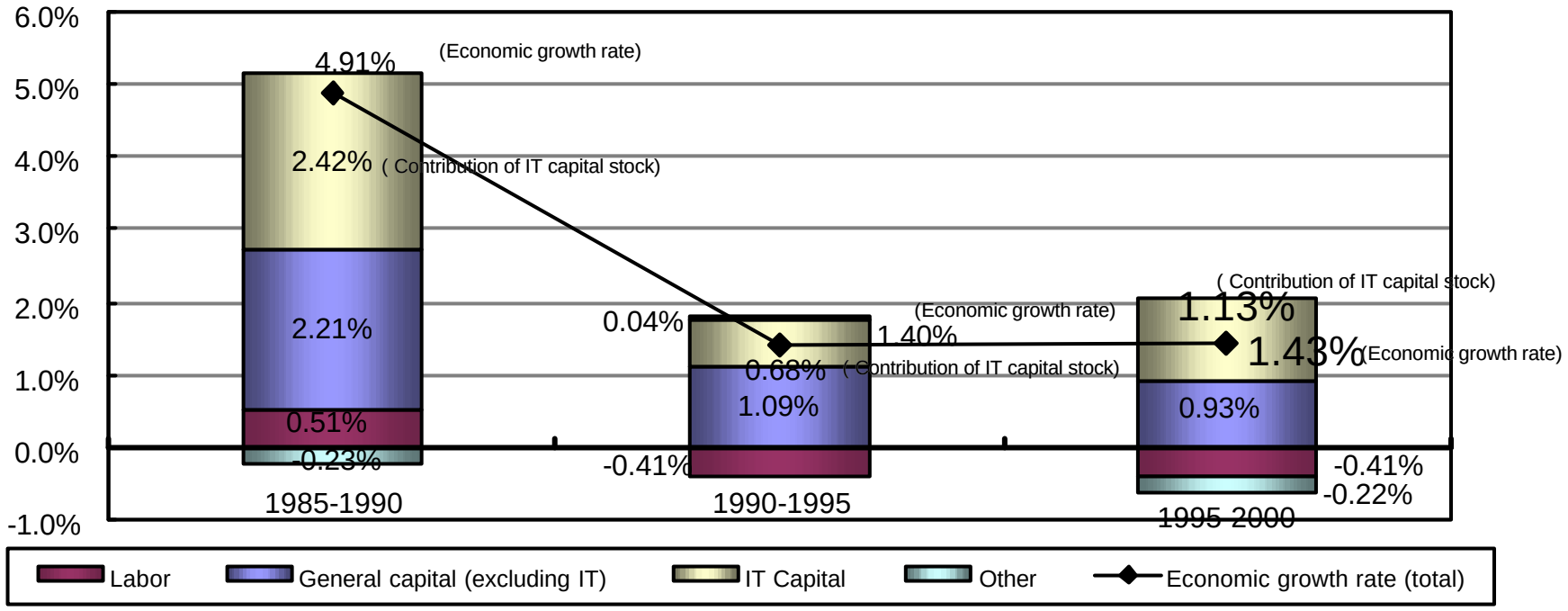
Source: *Survey of IT Economic Analyses*, MPHPT

(3) Contribution to Economic Growth of IT Capital Stock

◇ **IT capital stock makes a major contribution to the economic growth rate.**

- Of the 1.43% average economic growth rate in Japan between 1995 and 2000, the contribution by IT capital stock is 1.13%. With the IT capital stock being approx. 80% of the total (1.13%/1.43%), the IT capital stock is the driver and platform for economic growth.

Contribution of IT Capital Stock to Economic Growth



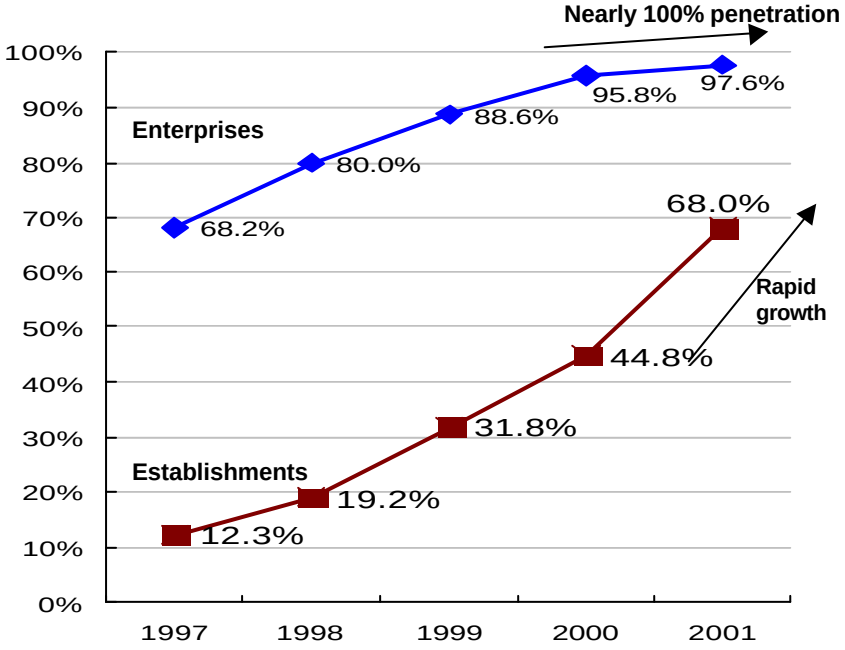
Source: *Survey of IT Economic Analyses*, MPHPT

(4) Advancements in IT in Businesses in 2001

◇ **There is steady growth in the use of the Internet and LANs in both large businesses ("enterprises") and small businesses ("establishments").**

- The penetration of the Internet in enterprises is 97.6%, while for establishments the penetration has increased by 23.2 points over the previous year to reach 68%. (Fig. 1)
- 80% of companies have LANs either company-wide or a part of the company. (Fig. 2)
- The proportion of companies wherein connections into LANs can be made from the outside has increased rapidly to 43% (from 26% a year ago). (Fig. 3)

Fig. 1: Trends in Internet Usage in Businesses



"Enterprises" defined as 300 employees or more.
"Establishments" defined as 5 employees or more.

Fig. 2: Proportion of Companies That Have LANs

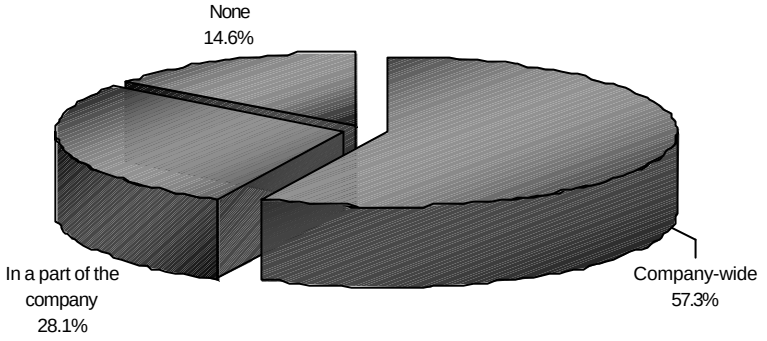
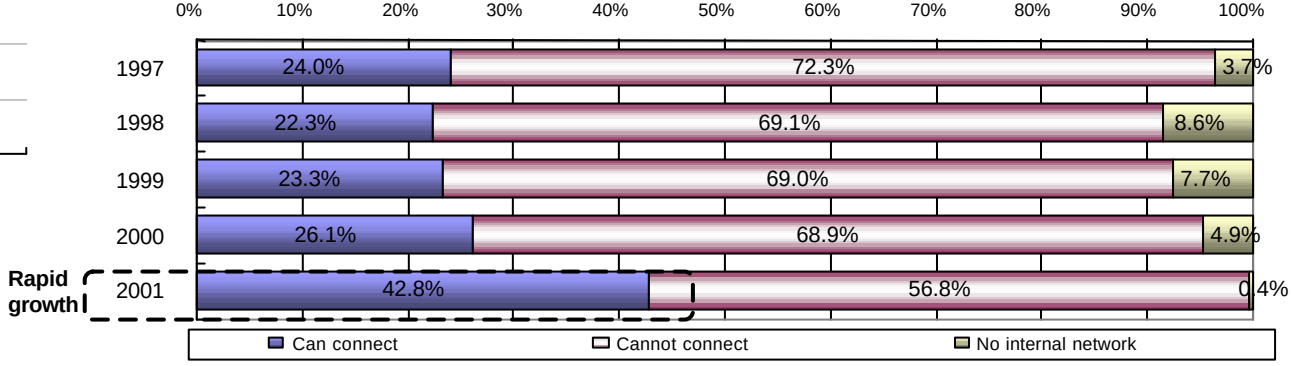


Fig. 3: Proportion of Companies Wherein It Is Possible to Connect to LANs from the Outside



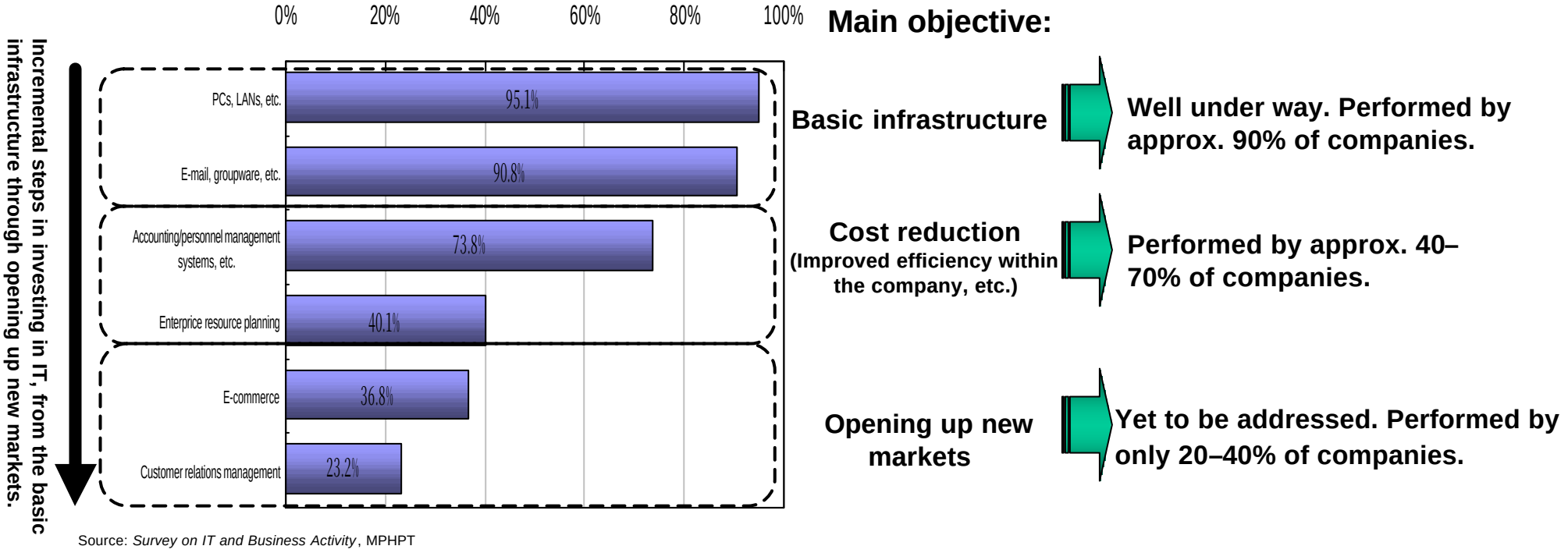
Source: *Communications Usage Trend Survey*, MPHPT (December 2001)

(5) Contents of Investments in IT

◇ **The basic stage in corporate investments in IT is in place, and now investments are moving to the next level amid at cost reduction and new market development.**

- Investments in IT to provide such basic infrastructure as PCs, LANs, and e-mail have already been made by more than 90% of companies.
- The proportion of companies that have made IT investments to reduce costs (such as accounting/personnel management systems or enterprise resource planning, etc.) is somewhat less, at between 40 and 70%.
- Conversely, the proportion of companies that have made IT investments for opening up new markets (such as investments in e-commerce and customer relations management) is no more than about 20 to 40%.

Proportion of Companies That Have Made Investments in IT (Multiple answer)



Source: *Survey on IT and Business Activity*, MPHPT

(6) Effects of IT Investments by Businesses

◇ **How businesses evaluate their IT investments:**

- Positive opinions (62%) vastly outnumber negative opinions (12%). (Fig. 1)
- However, when broken down by the purpose of the investments, IT investments for the purposes of opening new markets are evaluated lower than those of establishing basic infrastructure. (Fig. 2)

Fig. 1: Cost Effectiveness of Corporate Investments in IT (Proportion of Firms Responding "Good Investment")

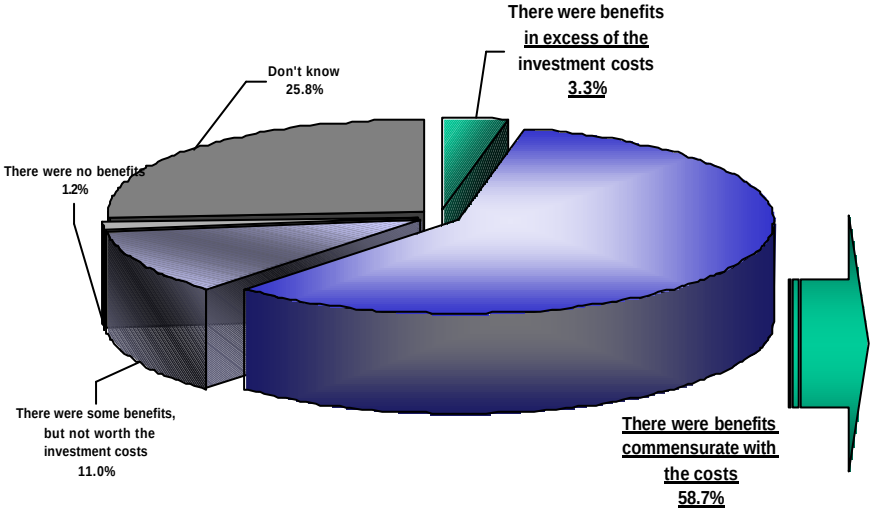
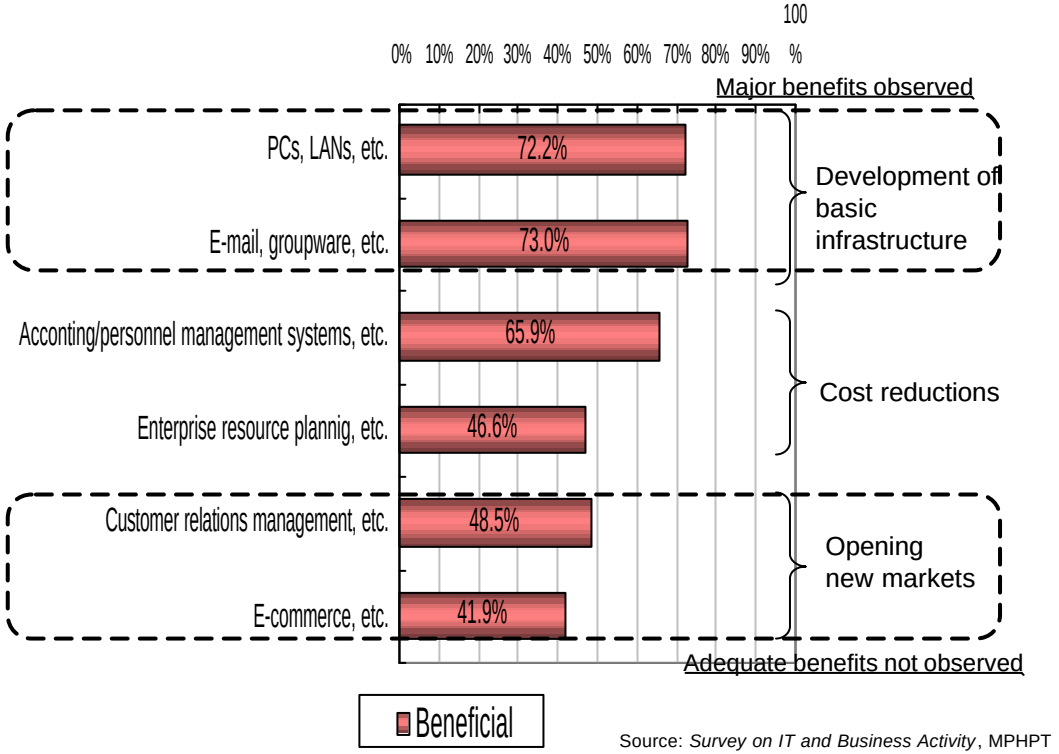


Fig. 2: Costs Effectiveness of Corporate Investments in IT, by Purpose of Investment (Proportion of Firms Reporting "Good Investment")



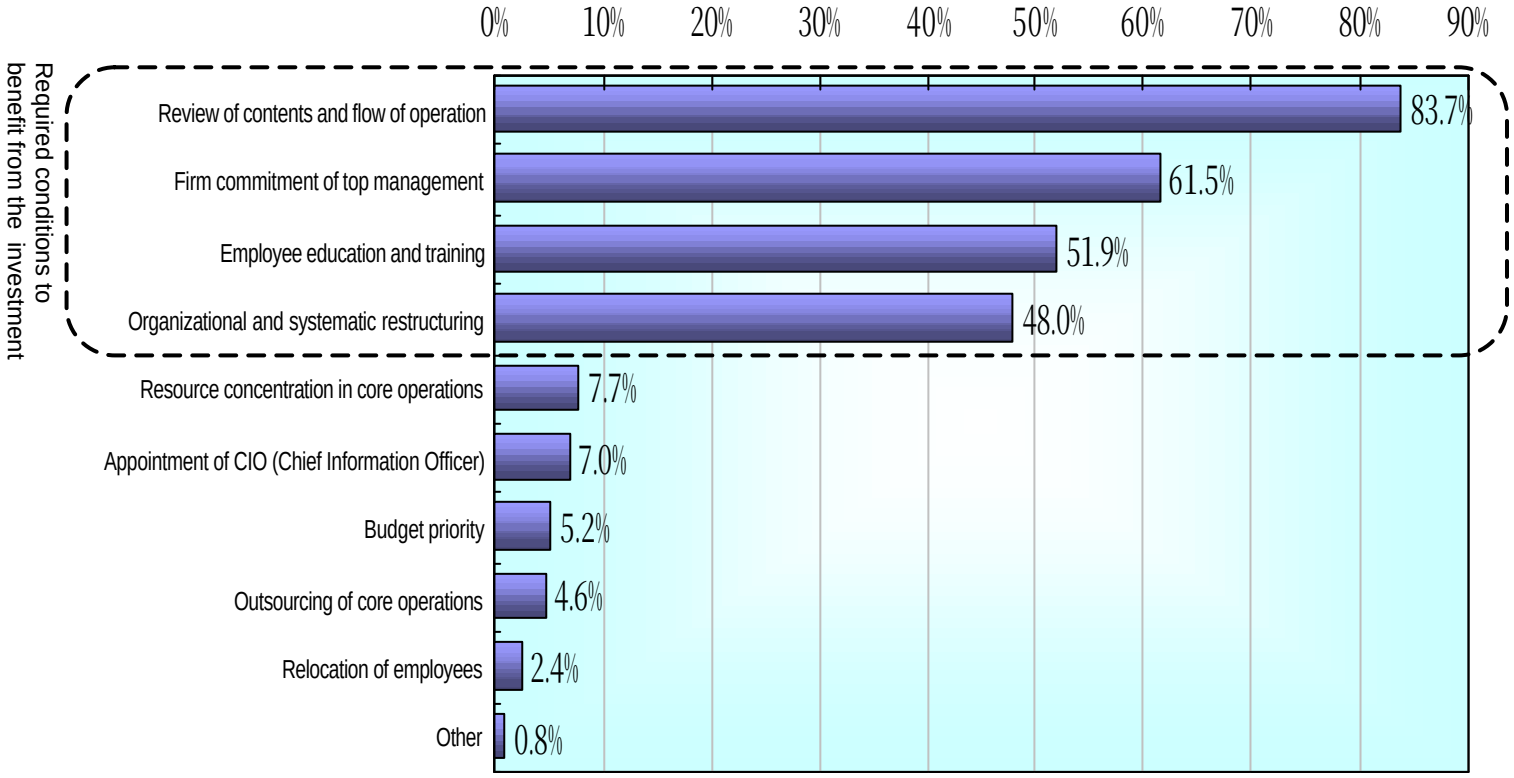
Source: *Survey on IT and Business Activity*, MPHPT

(7) Conditions Required for Businesses to Benefit from IT Investments

◇ **Companies are aware that they must review existing work practices and organizations in order to ensure that IT investments are effective.**

- The most common response (from more than 80% of the companies) was "review of contents and flow of operation."
- The next most common responses were "firm commitment of top management," "employee education and training," and "organizational and systematic restructuring."

Necessary Conditions for Achieving the Effects of IT Investments (Proportion of Conditions Required by Companies)
(Multiple answers)



Source: *Survey on IT and Business Activity*, MPHPT

(8) Reforming Operations and Organizations in the Light of Corporate Investments in IT

◇ **How businesses implement operational/organizational reform when making corporate investments in IT:**

- In terms of operational reform, 40–50% of companies have implemented "shifting to paperless systems within the company" and "promotion of information sharing." (Fig. 1)
- Conversely, the items such as "simplification of decision-making processes," "delegation of authority to subordinates," and other items pertaining to decision making, along with items that involve transaction with parties outside of the company, including "shifting to paperless transactions with entities outside of the company" and "review of transaction processes" have a low rate of implementation. (Fig.1)
- In restructuring organizations, implementation rates of "integrating or eliminating organizations ," "outsourcing businesses," and "reducing hierarchies" are all around 20%. (Fig. 2)

Fig. 1: Trends of Reforming Businesses and Organizations in the Light of Corporate Investments in IT (Proportion of Companies Reporting Implementation of the Applicable Activities)
(Multiple answers)

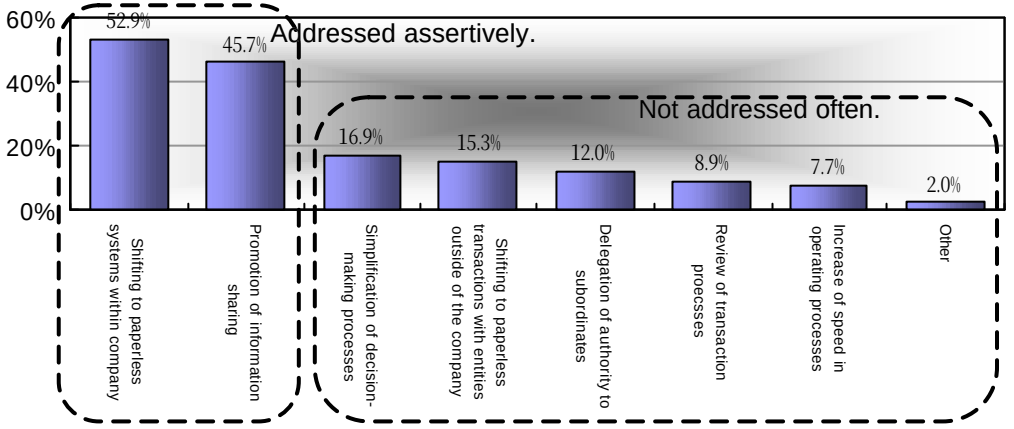
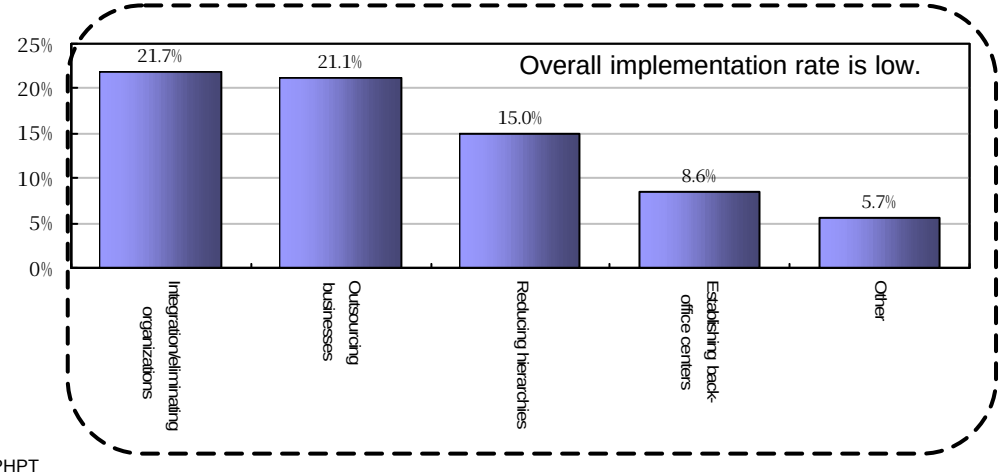


Fig. 2: Implementation of Restructuring Organizations and Systems in the Light of IT investments (Proportion of Companies Reporting Implementation of the Applicable Activities)
(Multiple answers)



Source: *Survey on IT and Business Activity*, MPHPT

3. Use of IT in Governments

(1) Development of IT in Local Governments

◇ **Steady increase of IT in the local governments**

- 100% of prefectural governments have LANs in place, in contrast to 88.6% for city, town, and village governments. (Fig. 1)
- The ratio of PC installation in prefectural governments is 1unit/1.1 people, while this ratio stands at 1unit/1.7 people for city, town, and village governments. (Fig. 1)
- 100% of prefectural governments have their Web sites in place, in contrast to 83.3% for city, town, and village governments. (Fig. 2)

Fig 1: PCs and LANs in Local Governments

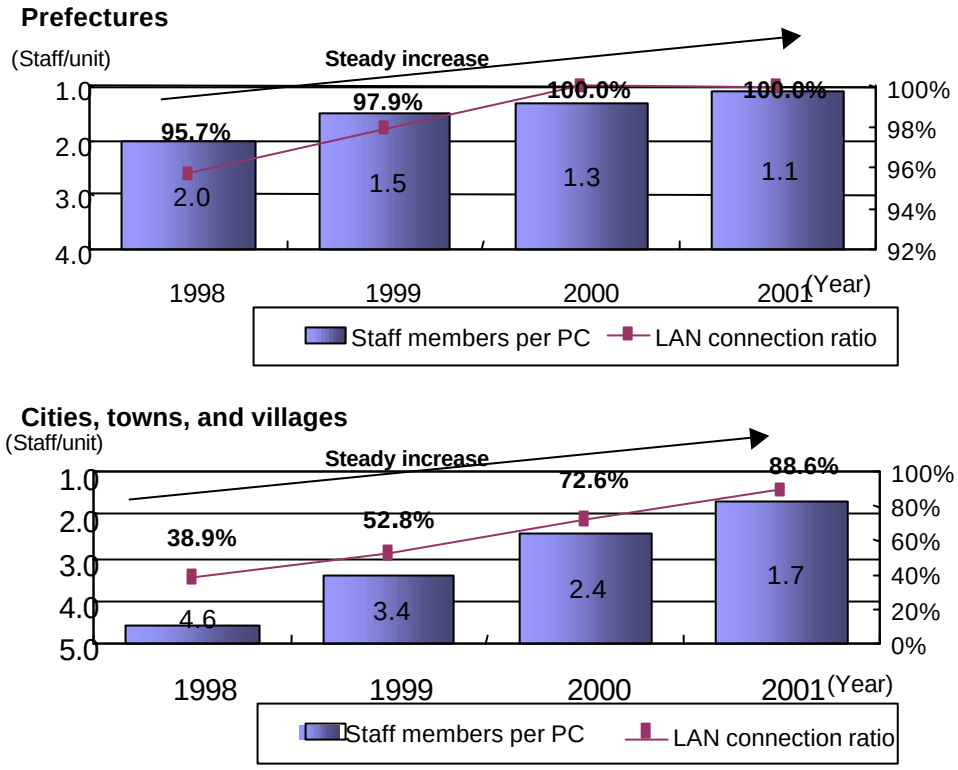
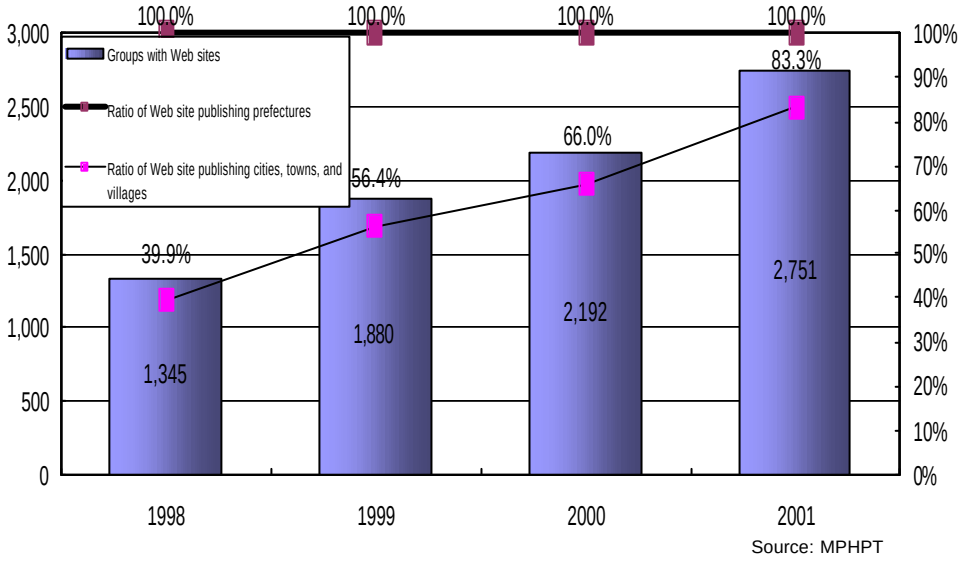


Fig. 2: Web Sites for Local Governments



Source: MPHPT

(2) Effects of E-Municipalities

◇ Benefits of e-municipalities

- When workers for local governments were asked about changes in their jobs brought about by the implementation of electronic municipalities, the most common answer (nearly 80%) was that “the speed of work increased,” and almost 60% responded that “the quality of work improved.” (Fig. 1)
- When it comes to the objectives and motivation behind using the Web sites for the local governments, “accessible 24 hours a day,” and “no need to visit offices.” Using IT in local governments focuses on improving convenience by enabling users to access governmental services at any time from any place. (Fig. 2)

Fig. 1: How Electronic Municipalities Has Changed the Work of Municipal Employees (Responses from Local Governments)

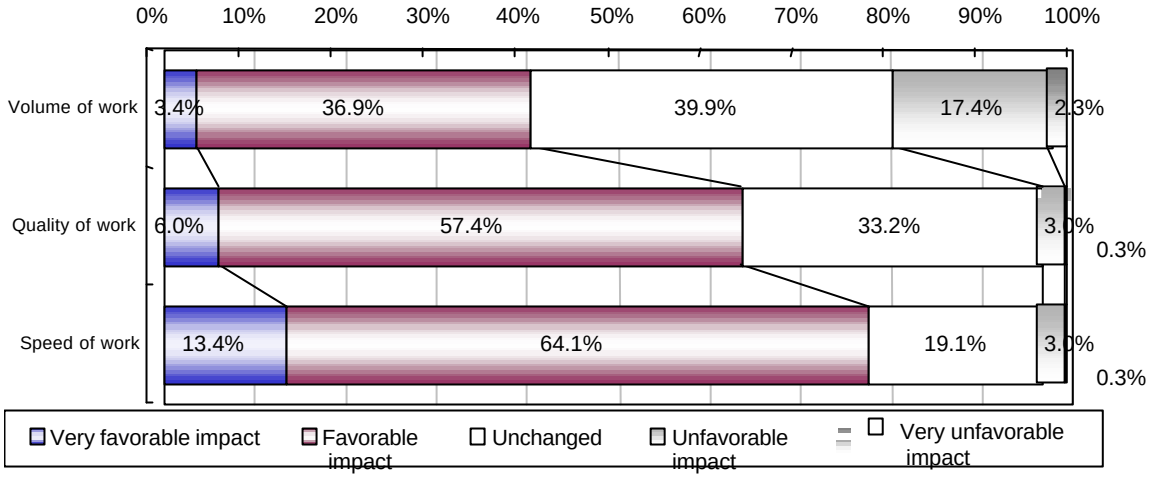
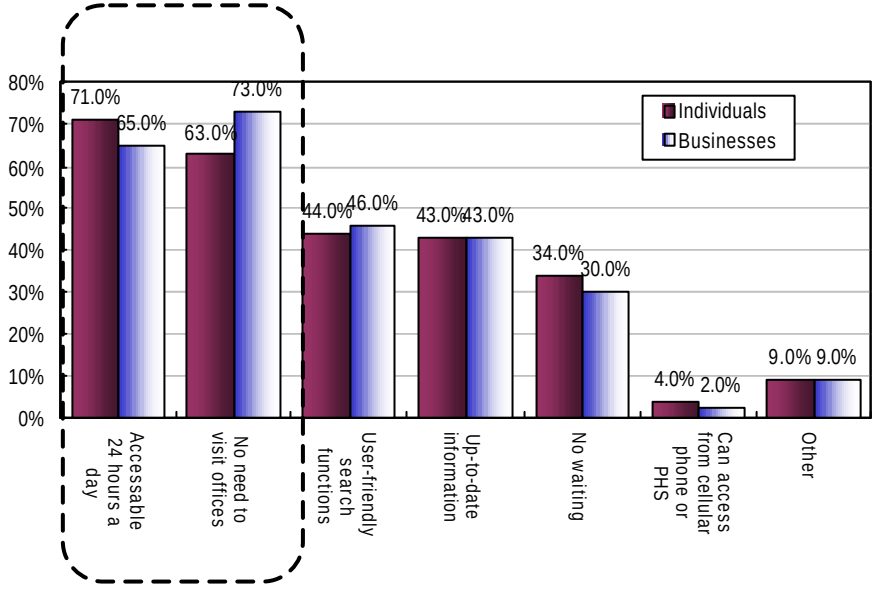


Fig. 2: Objectives/Motivation for Using the Web Sites of the Local Governments (Responses from Individual and Business Users)



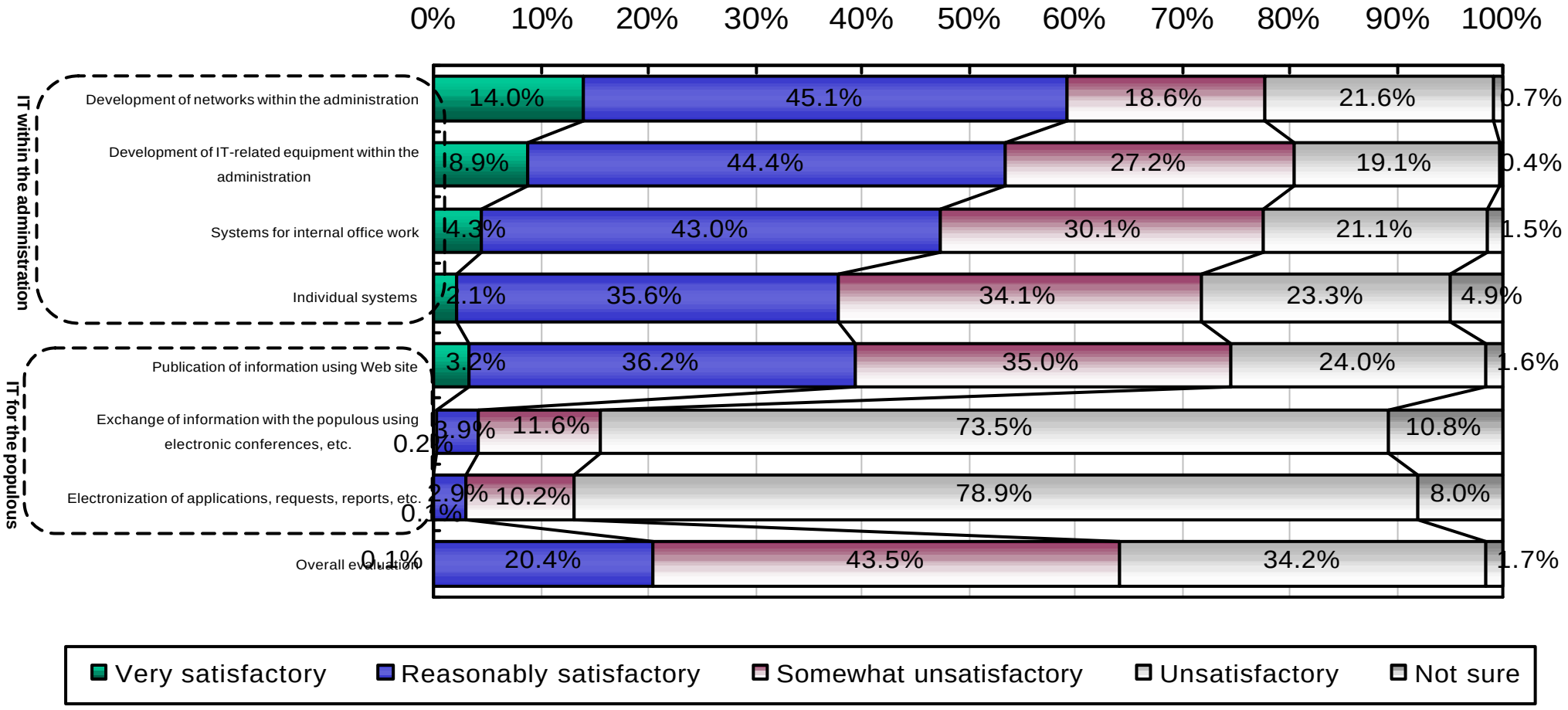
MPHPT: *Survey of Administrative Information Intensification in Local Government*, MPHPT

(3) Evaluation of Local Governments in Implementing E-Municipalities

◇ **How local governments evaluate their undertakings for the e-municipalities services:**

- There is a high level of satisfaction with IT within the administration such as the development of networks and IT-related equipment within the administration. Opinions indicate that progress is being made.
- Evaluations are rated relatively low regarding IT for the populous in regards to “electronization of applications, requests, etc.” reports, except for “publication of information using Web sites”.

Local Governments’ Self-Evaluation of Their E-Municipalities Services



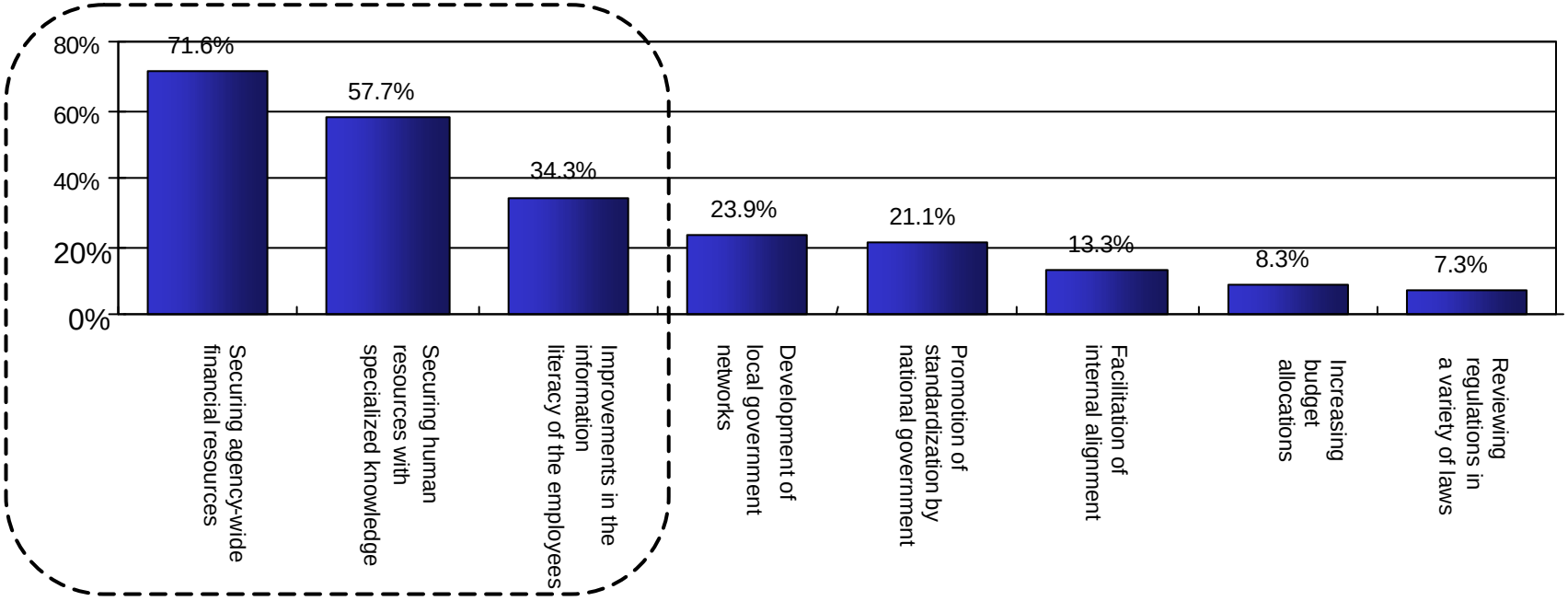
Source: *Survey of Administrative Information Intensification in Local Government*, MPHPT

(4) Required Conditions for Implementing E-Municipalities

◇ **Conditions thought necessary by local governments when implementing e-municipalities are:**

- The most common response is “securing agency-wide financial resources,” an answer given by more than 70% of the local governments.
- The next most common answers are “securing human resources with specialized knowledge” (nearly 60%) and “improvements in the information literacy of employees” (more than 30%).

Necessary Conditions for Implementing E-Municipalities (Responses from Local Governments)



Source: *Survey of Administrative Information Intensification in Local Government*, MPHPT

(5) Approaches by Local Governments to the Implementation of E-Municipalities (a)

◇ **Cost-reduction and human resource development measures are taken as follows:**

- In the approaches to cost reductions and to establish/upgrade an infrastructure, the “use of an off-the-shelf software package” response accounted for a high proportion of the responses. (Fig. 1)
- In the approaches to cost reduction in operations/administration, the “use of outsourcing to the private sector” response accounted for a high proportion of the responses. (Fig. 1)
- As a measure for developing human resources, “sending employees to external seminars” was heard more than 50% of the answers, and “conducting internal IT seminars” was heard more than 30%. (Fig. 2)

Fig. 1: Approaches to Cost Reductions in Local Governments for Implementing E-Municipalities (Responses from Local Governments)

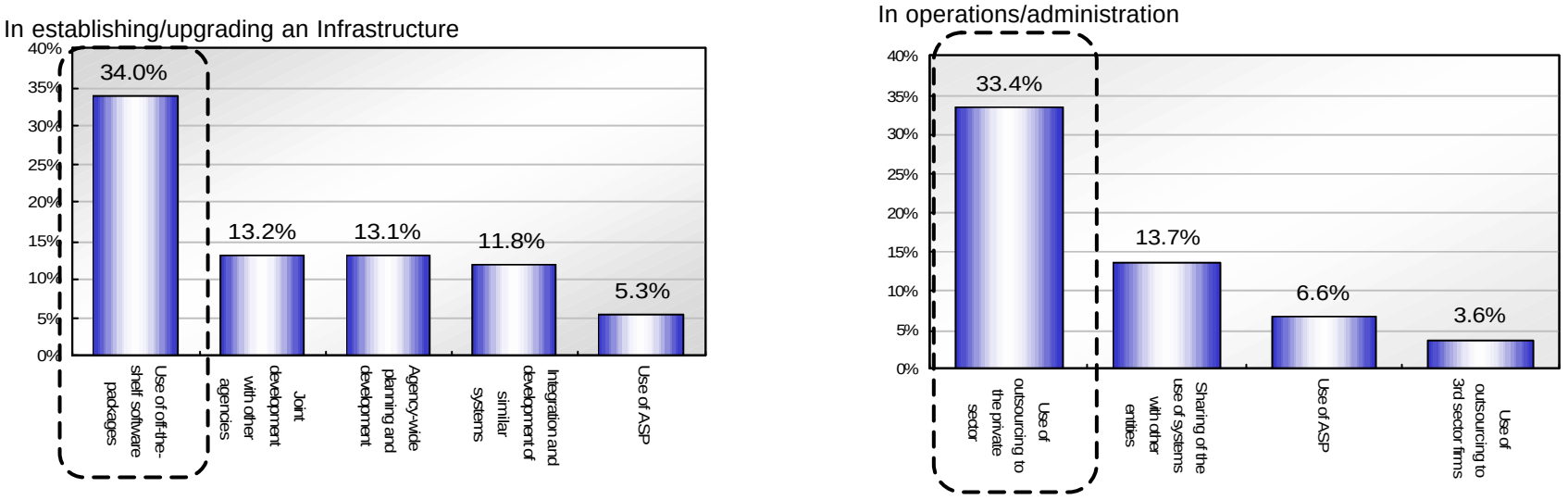
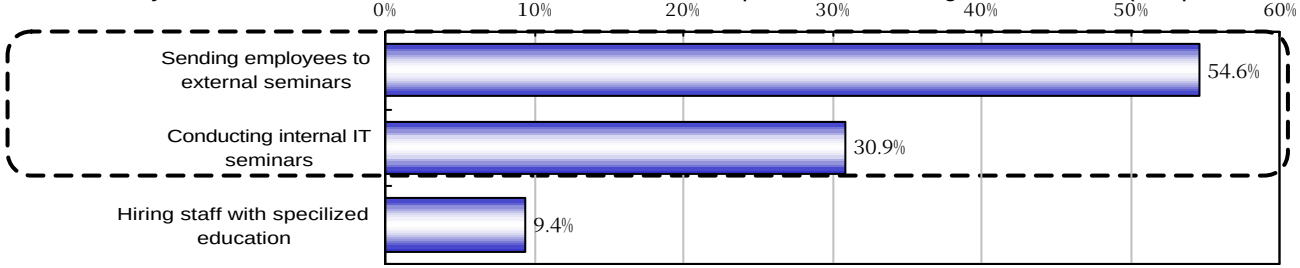


Fig. 2: Measures Undertaken by Local Government for Human Resources Development Concerning IT Promotion (Responses from Local Governments)



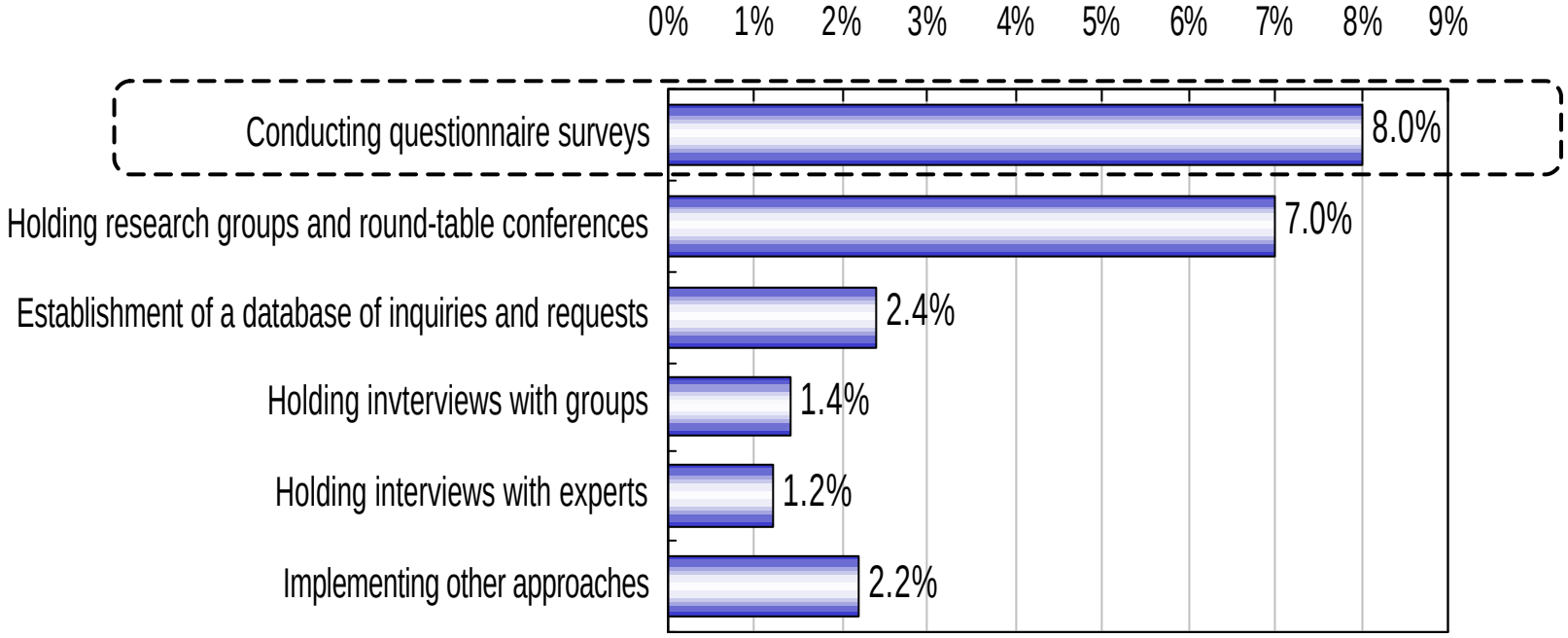
Source: *Survey of Administrative Information Intensification in Local Government*, MPHPT

(5) Approaches by Local Governments to the Implementation of E-Municipalities (b)

◇ **It is important to be aware of the needs of the users (individuals and companies) for promoting e-municipalities based on the specific circumstances of the particular local government.**

- "Conducting questionnaire surveys" was the most common response from 8.0% of the local governments in regards to the approach taken to find out the needs of the users.

How Local Governments Grasp the Needs of the Users Regarding E-Municipalities
(Responses from Local Governments)



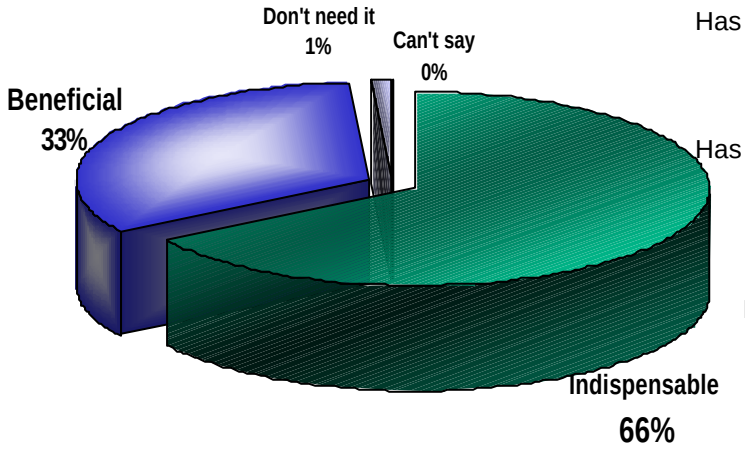
Source: *Survey of Administrative Information Intensification in Local Government*, MPHPT

(1) The Internet in Daily Life

◇ **To the users of the Internet, it has become more than just beneficial, but rather an indispensable daily necessity.**

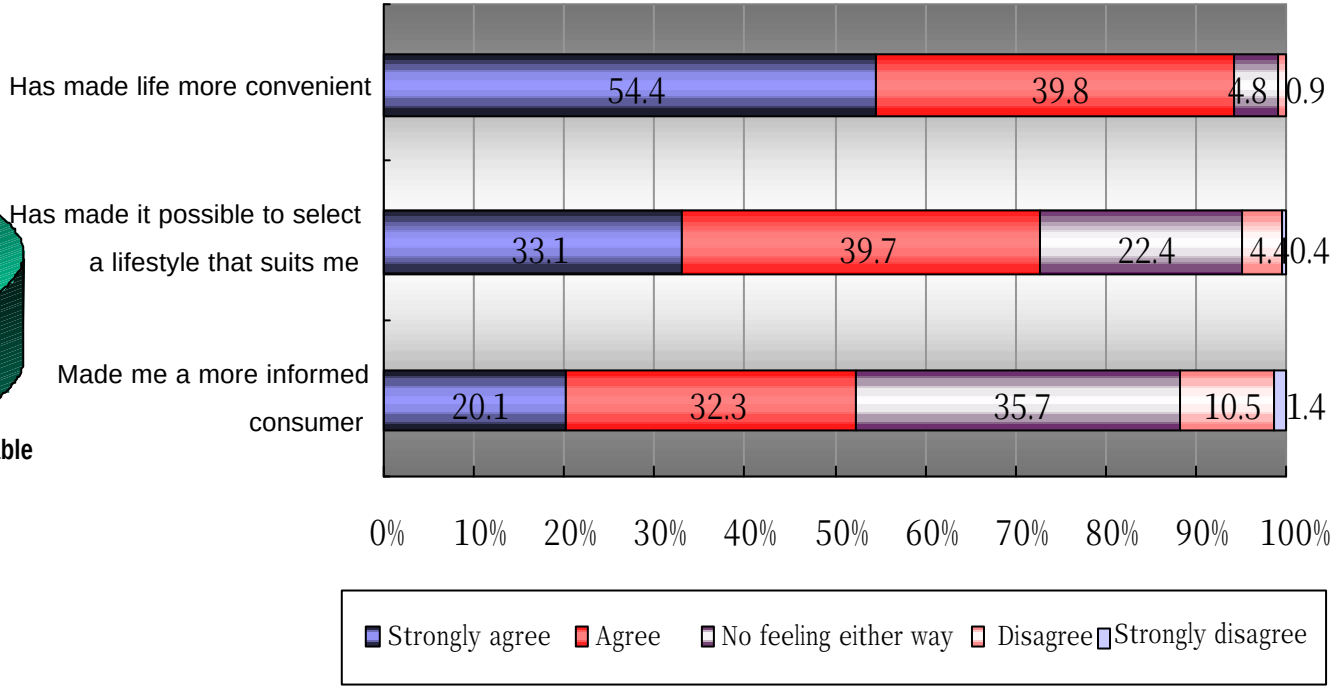
- 2/3 users report the Internet as indispensable, while 1/3 report the Internet to be beneficial. (Fig. 1)
- 70 to 90% report that the Internet has "made life more convenient," and "has made it possible to select a lifestyle that suits me." Conversely, the number of users reporting that "the Internet has made me a more informed consumer" has not passed the 50% mark. (Fig. 2)

Fig. 1: The Internet in Daily Life



Source: Survey of IT and lifestyle (Web Survey), MPHPT (March 2002)

Fig. 2: Effects of Internet Use on Daily Life



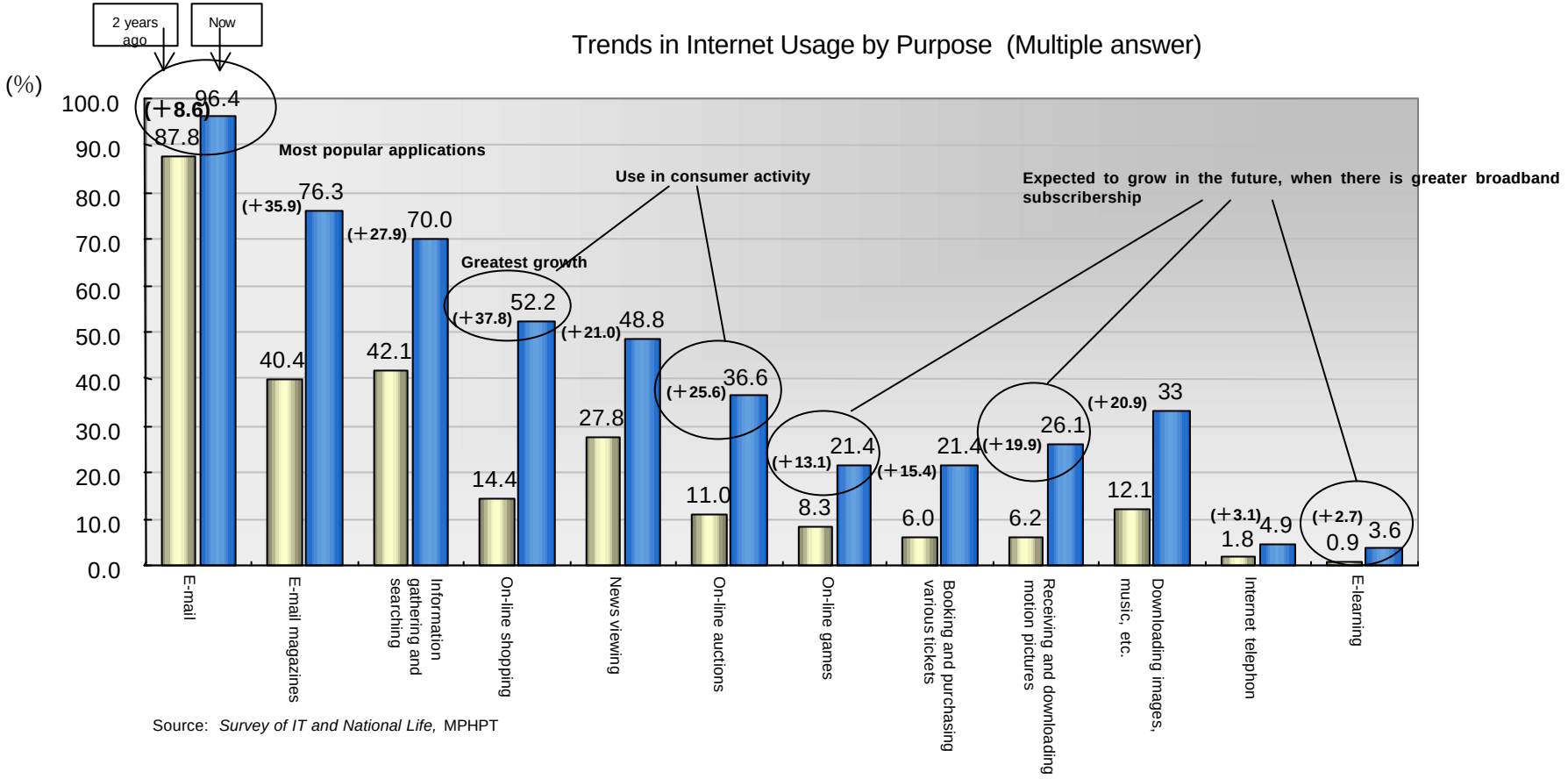
Reference: Article 5 of of Basic Law on the Formation of an Advanced Information and Telecommunications Network Society (IT Basic Law) Article 5: Status that formation of an advanced information and telecommunications network society must provide improvements in convenience in life, promotion of diversity of lifestyles, and increased opportunity for objective and rational choices by consumers, and must contribute to the creation of lifestyles that provide a sense of richness in the lives of individuals.

(2) Advances in Internet Usage

◇ **The rates of Internet use in various applications have increased compared to two years ago. The usage of the Internet is increasing steadily.**

- Compared to two years ago, there have been increases in use rates for all applications, and use rates are increasing.
- E-mail is the most common use application today as it was two years ago. This is followed by mail magazine and information gathering/search.
- In terms of the amount of increase, net shopping has increased most significantly, while the use of auction services has also increased substantially. As such, the usage in consumer activities advanced.
- In contrast the use rates of on-line games, viewing motion pictures, and e-learning, which are more suited for broadband connections, are relatively low.

Trends in Internet Usage by Purpose (Multiple answer)



Source: *Survey of IT and National Life,* MPHPT

(3) Digital Divide

◇ **While use rates of the Internet are increasing regardless of user demographics, the digital divide still exists (Figs. 1-4)**

Fig. 1: By Gender

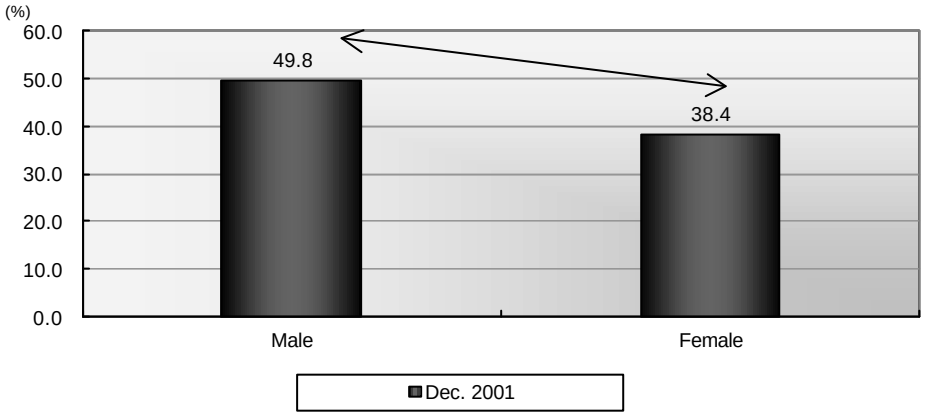


Fig. 2: By Size of City

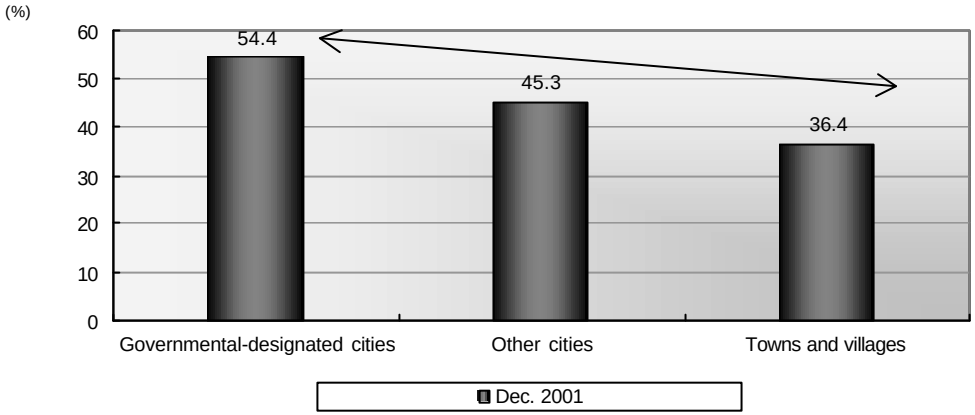


Fig. 3: By Annual Household Income

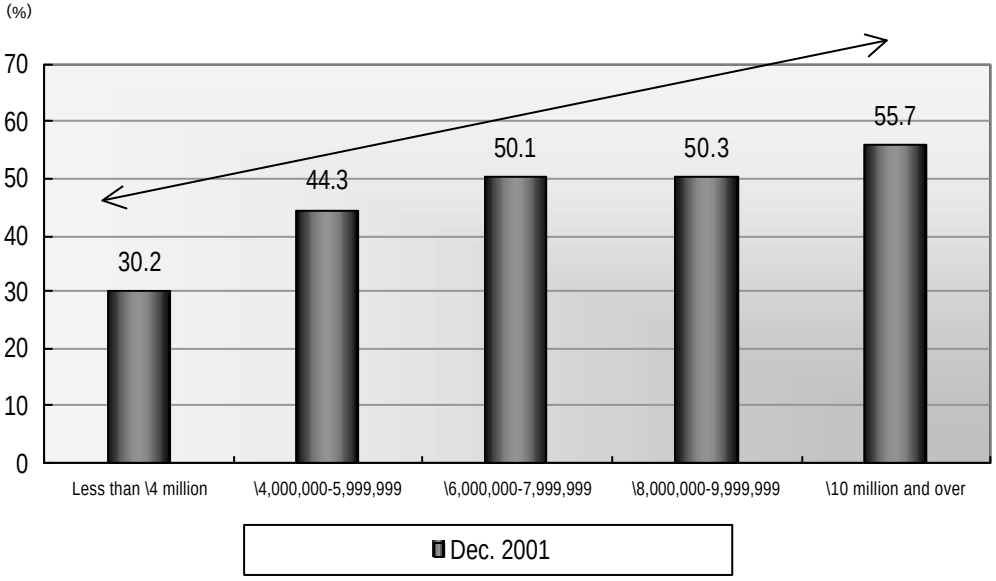
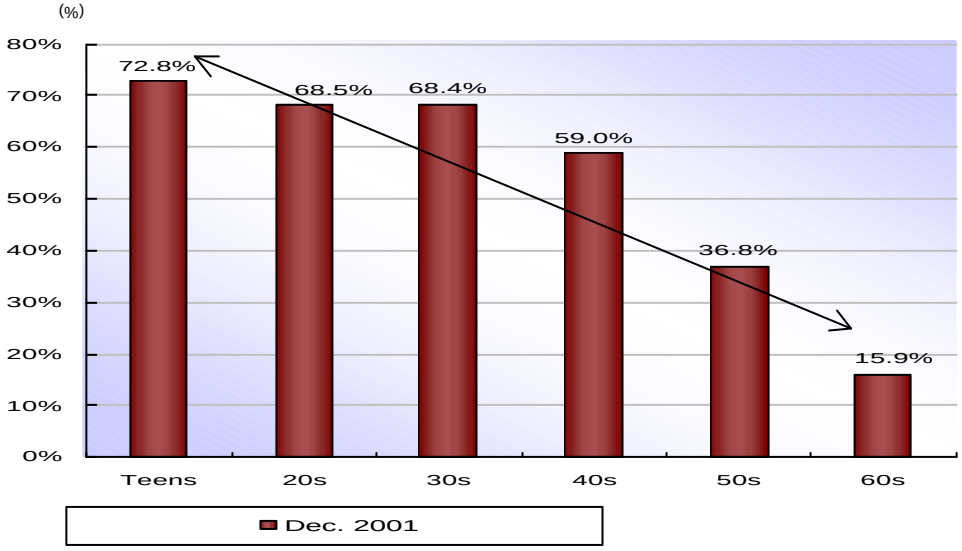


Fig. 4: By Age



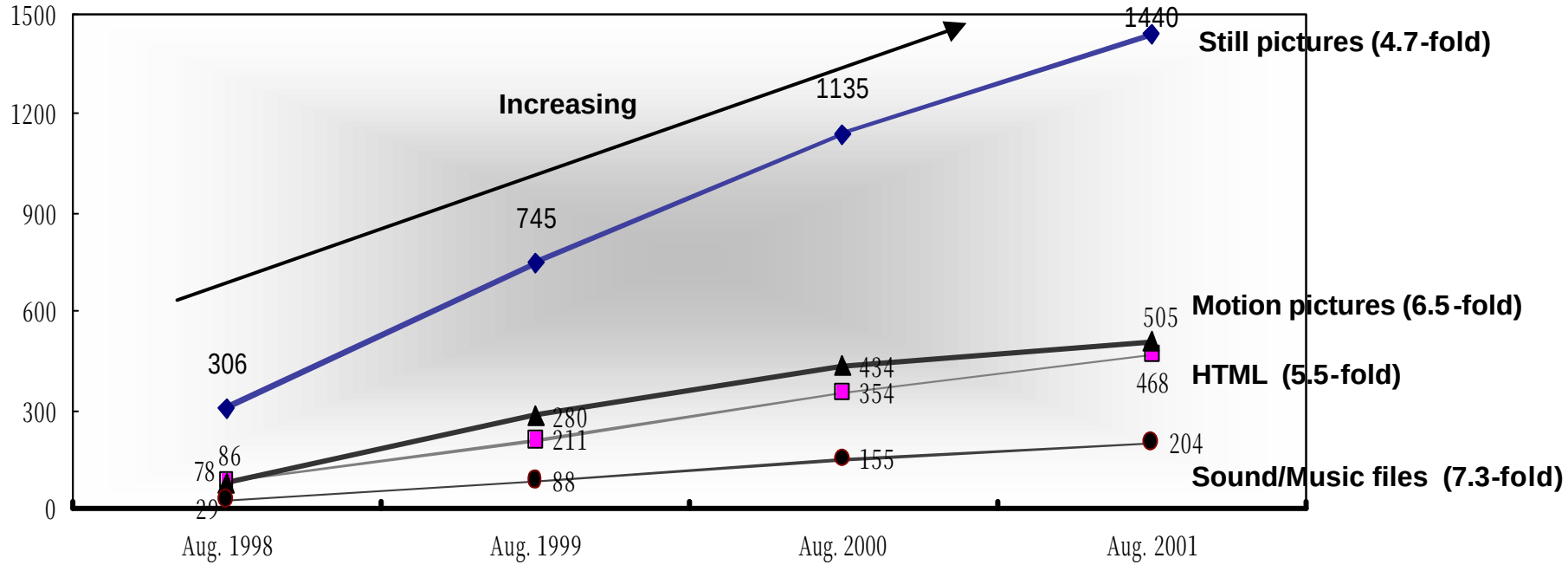
Source: *Communications Usage Trend Survey*, etc. MPHPT (Dec. 2001)

(1) Trends in the Total Volume of Content on the Internet

◇ **The provision of contents on the Internet has increased 6.7-fold over the last three years (4.7-fold for still pictures, 7.3-fold for sound files/music files, and 6.5-fold for motion pictures).**

◇ **Still pictures account for the greatest proportion of contents.**

Trends in Internet Content Volume (on the .jp domain)



Total volume	664 GB	1,889 GB	3,212 GB	4,446 GB	6.7-fold

Note: Figures in parentheses show changes in last three years.

Source: ***Research on a Statictical Technique for Internet Content***

(2) Distribution of Content by Media

◇ The scale of the content market in the fiscal 2000 was about 10,906 billion yen (with the primary market at 9,537.1 billion yen and the secondary market at 1,368.9 billion yen). (Fig. 1 and 2)

◇ Terrestral television programs held the largest share at 28.9% in the primary market, but held only 6.5% in the secondary market. It is hoped that a secondary market for terrestrial television programs will be formed using the Internet and other broadband services.

Fig. 1: Scale of the Primary Market for Content

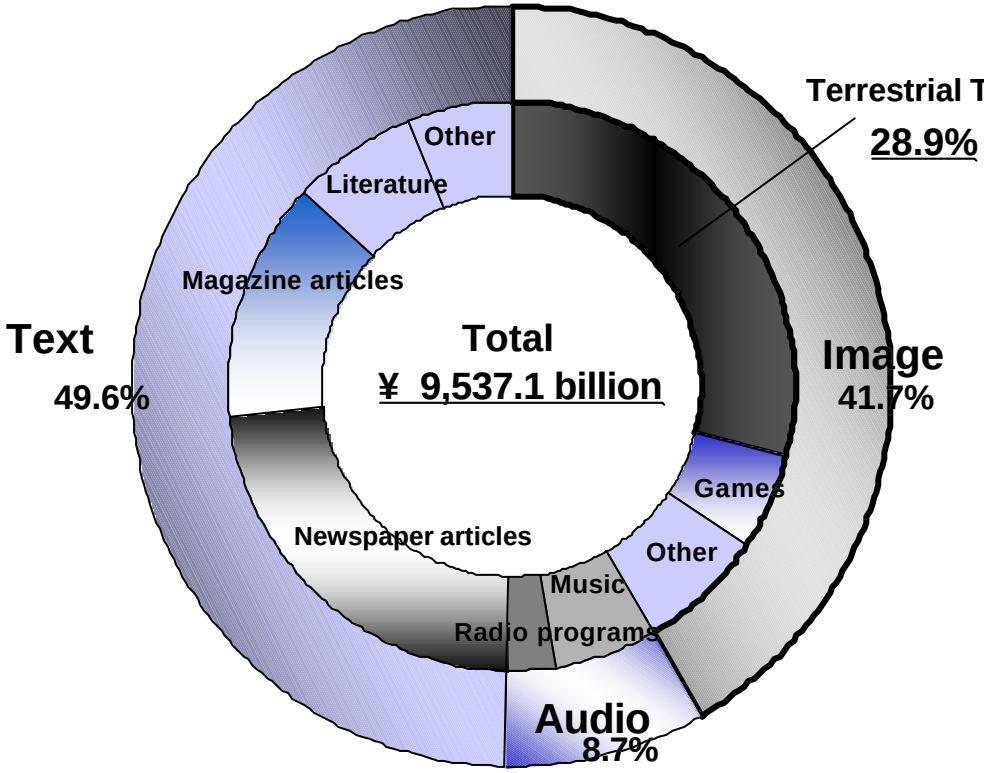
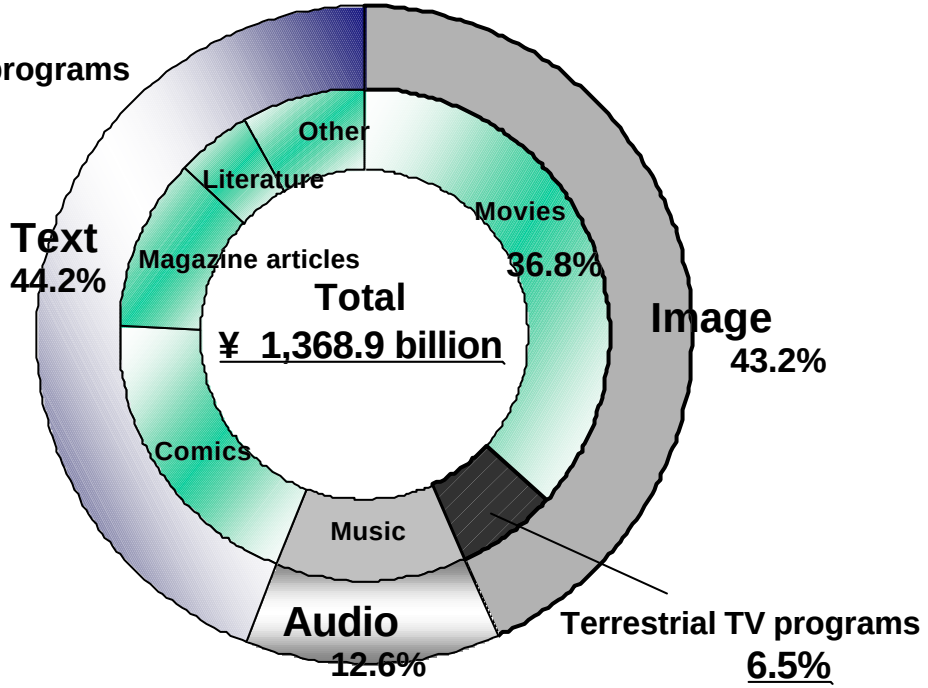


Fig. 2: Scale of the Secondary Market for Content



Source: *Survey the Creation and Circulation Market of* Media Software, MPHPT (March 2002)

(3) Needs and Issues in Terms of Promotion of Content Distribution

◇ **The needs for content services made available by broadband are quite high. (Fig. 1)**

◇ **When using content provided on the Internet, the users are dissatisfied or are concerned in that "the transmission speed is slow" (55%), "personal information might be leaked" (50%), "payment procedures might not be correct," etc. These concerns are greater than "a lack of appealing content" (37%) and must be resolved before the content business can be successful.**

Fig. 1: The Use of Content Services over Broadband Networks (Current, and Intended Future Use)

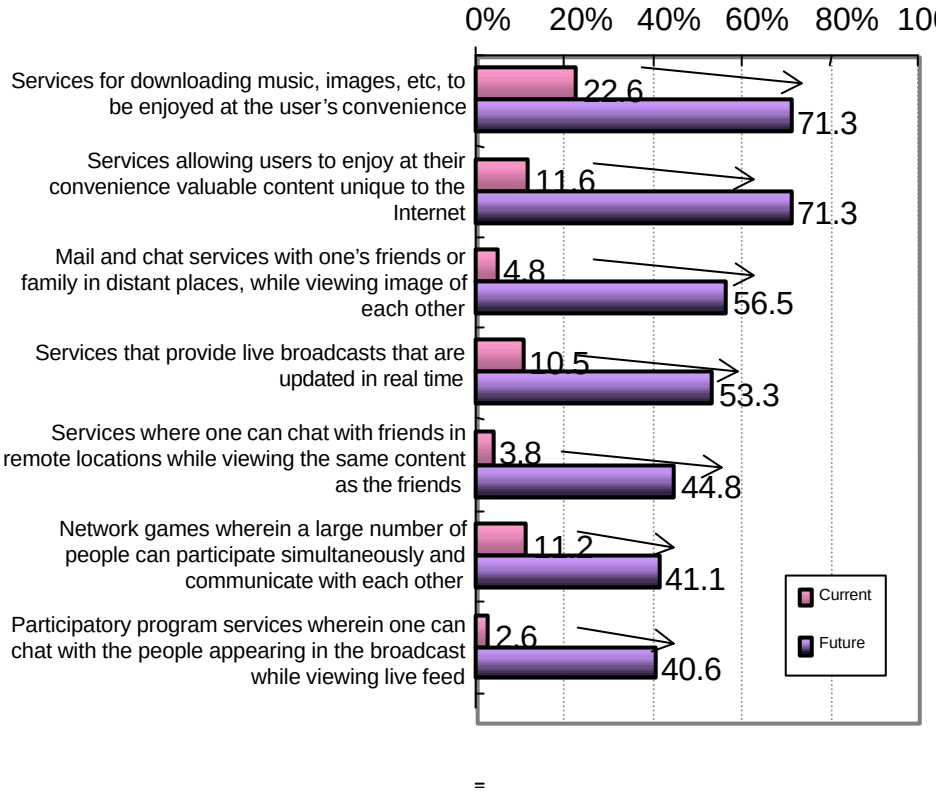
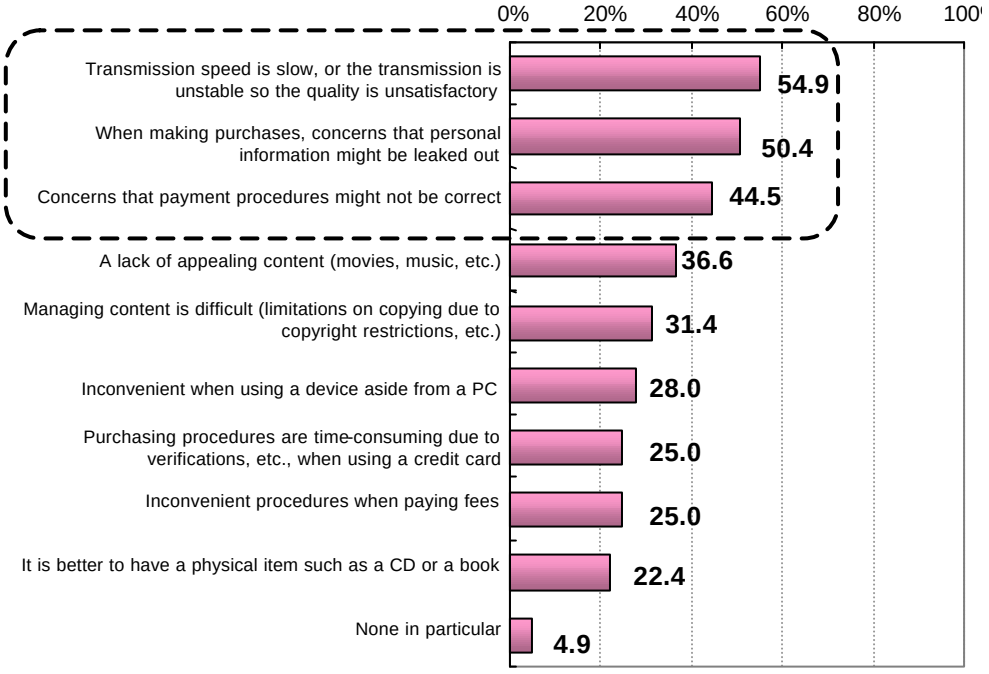


Fig. 2: Concerns When Using Content Services on the Internet



Source: *Survey of IT and National Life,* MPHPT

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(1) Computer Viruses, Illegal Access

- ◇ **60.3% of businesses have had some types of invasion incident over the past year. (Fig. 1)**
- ◇ **The most common of these is being infected with a virus, accounting for 96.0% of the cases where there has been an invasion incidents. (Fig. 2)**

Fig. 1: Computer Invasion Incidents in Businesses over the Past Year

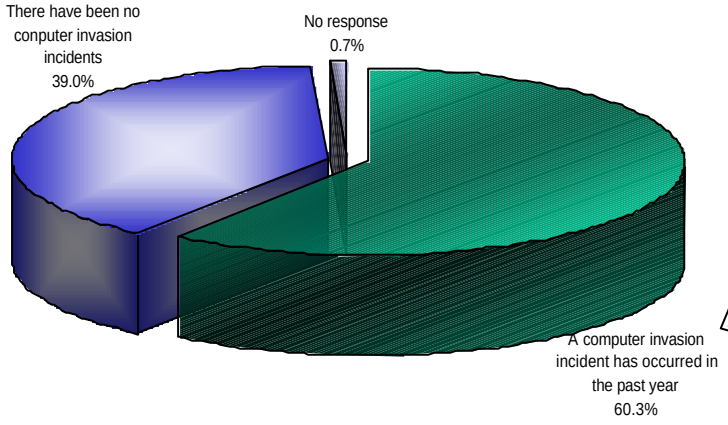
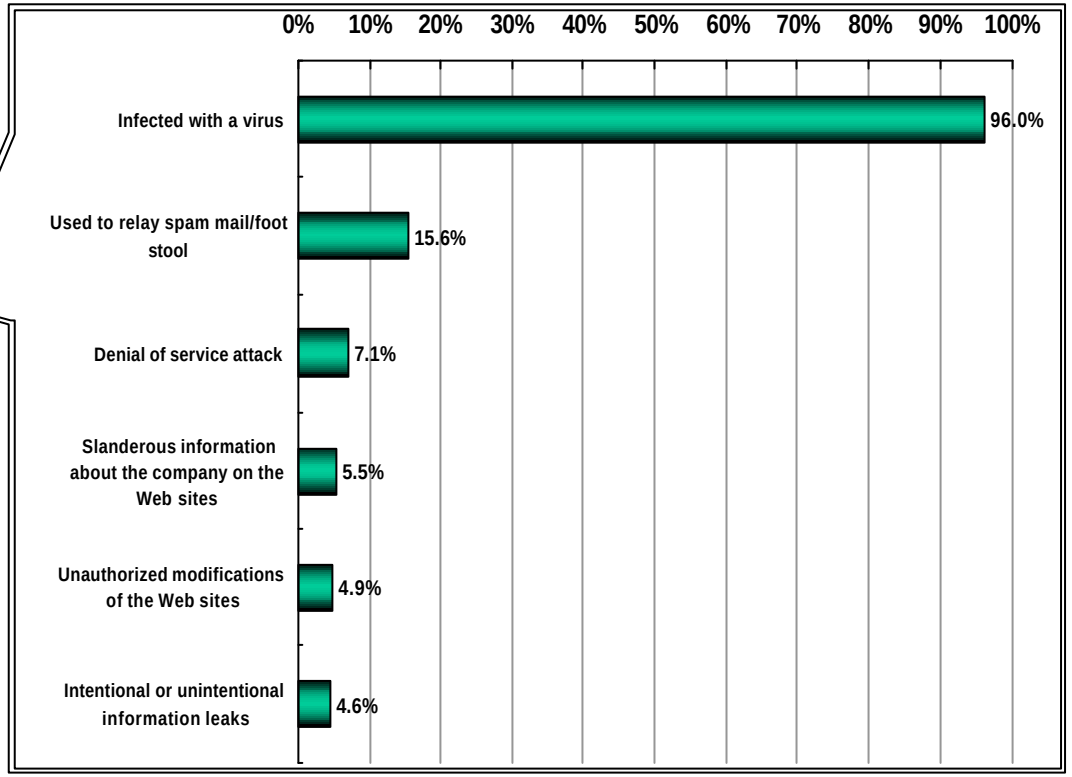


Fig. 2: Details of the Compute Invasion Incidents



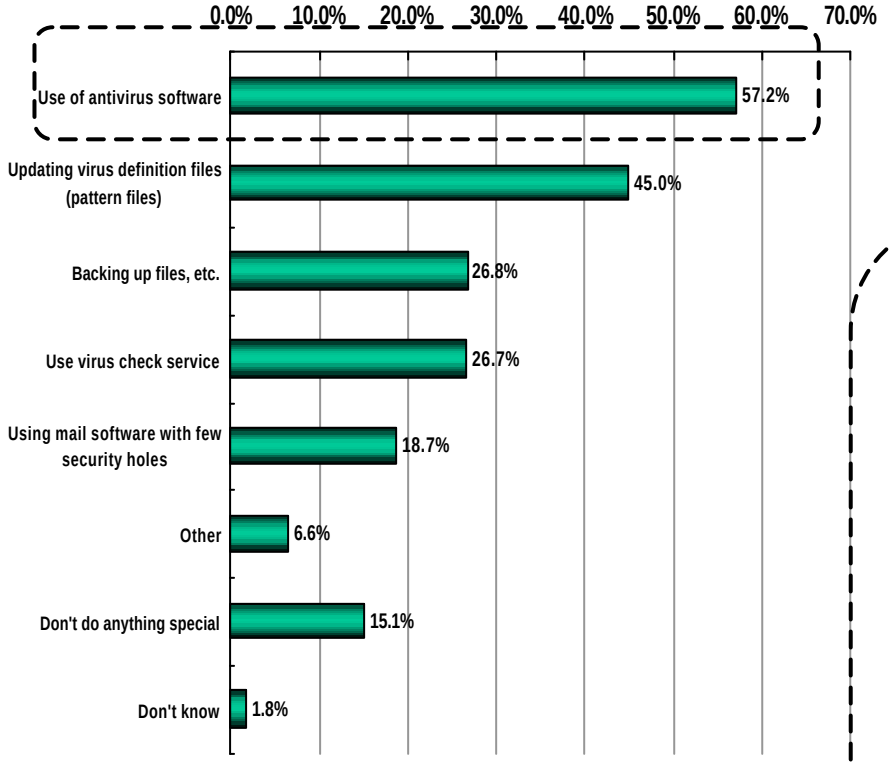
Source: *Surveys On the Current State of Information Security Measures*, MPHPT

(2) What Countermeasures Are Taken by Individuals, Businesses, and Local Governments against Computer Viruses, Illegal Access, etc.

◇ **Computer invasion including viruses and illegal access are rising sharply, requiring urgent measures.**

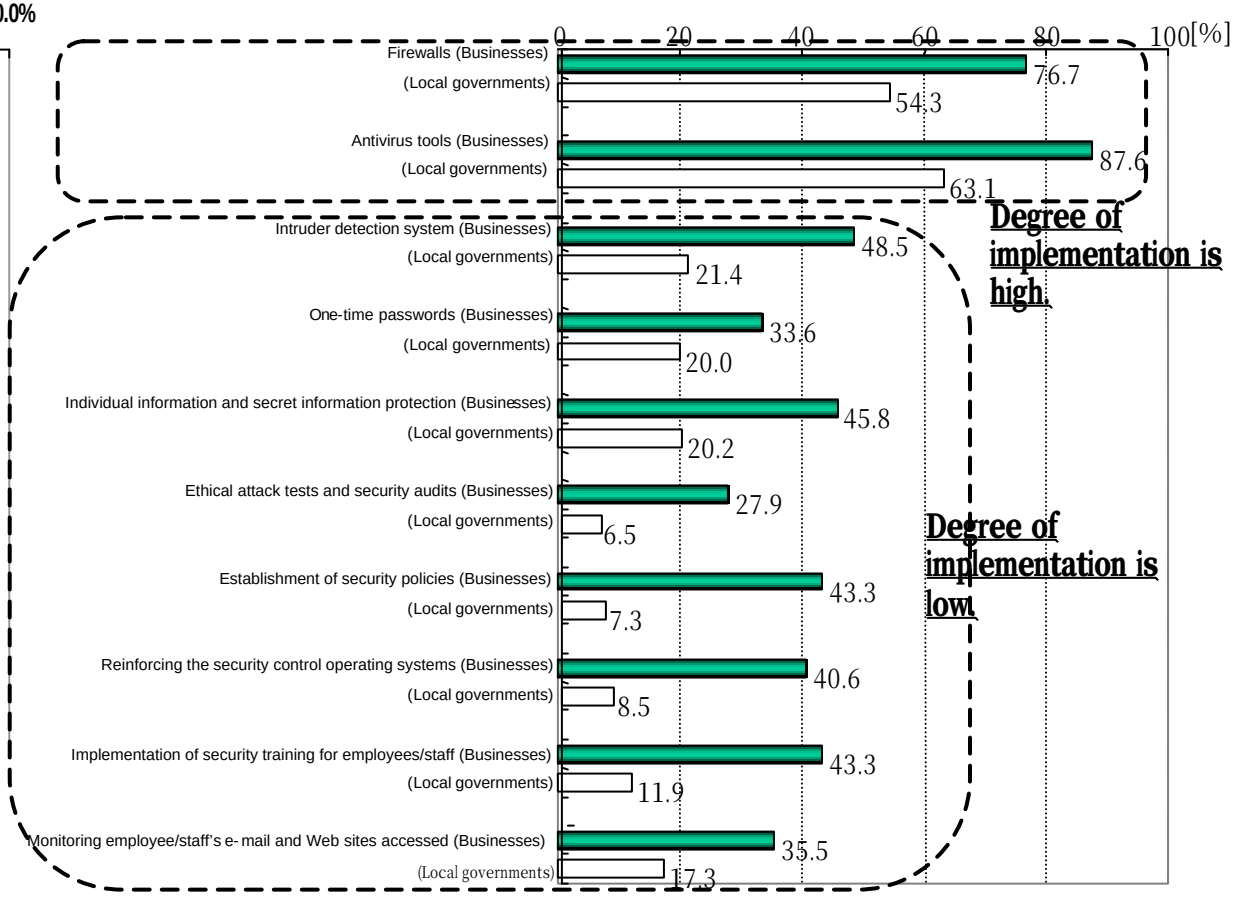
- In terms of individuals' countermeasures against computer virus, half of users report the "use of antivirus softwares. (Fig. 1)
- For corporate/local governments' illegal access/virus security measures, half are pursuing firewalls and antivirus tools, but the percentage of businesses/local governments that have established security policies, performed security audits, etc., is low. (Fig. 2) Also, compared with corporate responses, overall the percentage of security measures put in place by the local governments is low.

Fig. 1: Virus Countermeasures Taken by Individuals



Source: *Survey Concerning Safety and Future Technologies in the Field of Information and Communications,* MPHPT

Fig. 2: Countermeasures Taken by Businesses and Local Governments Against Illegal Access/Computer Viruses



(3) Issues for Ensuring Security Information

◇ **When making e-commerce transactions, about 80% of users have concerns about "security of credit card numbers and leaks of personal information." Additionally, more than 50% of users have strong concerns as to whether the product received will be the same as the one shown on the screen" and concerns about "whether or not the product will arrive safely." (Fig. 1)**

◇ **Conversely, less than 30% of businesses are addressing the issues of protecting personal information. (Fig. 2)**

Fig. 1: Concerns/Dissatisfaction Regarding E-Commerce Transactions

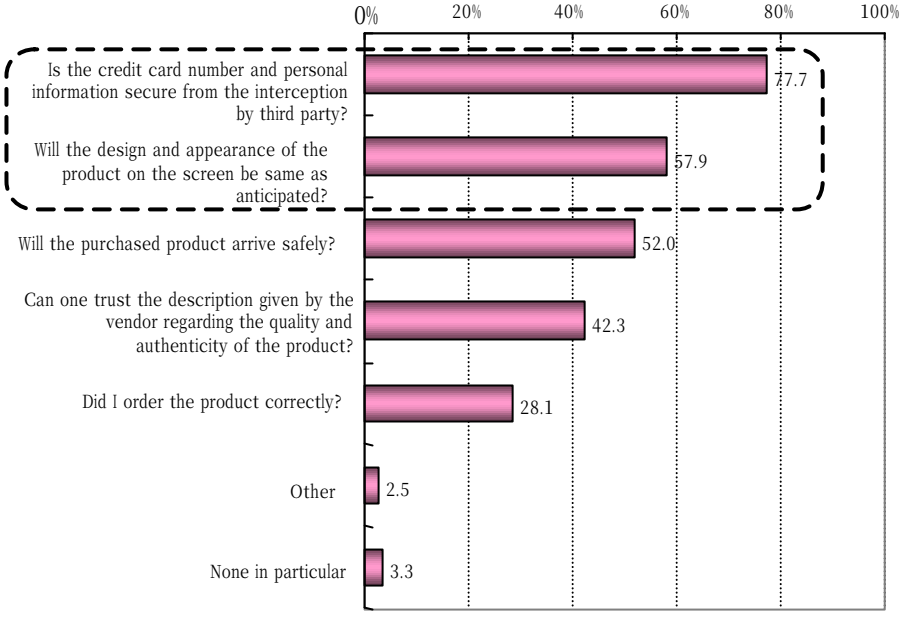
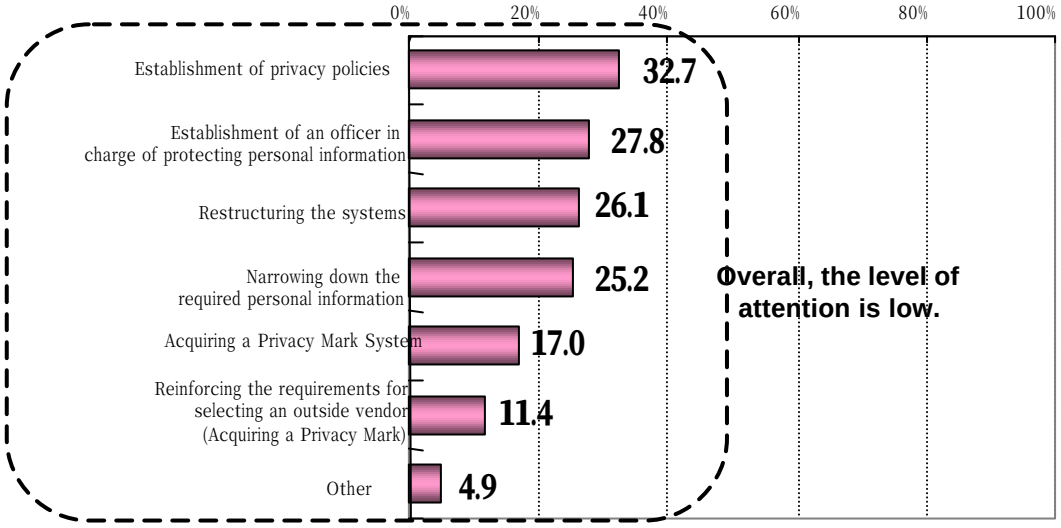


Fig. 2: Approaches Taken by Companies to Protect Personal Information



Source: *Survey Concerning Safety and Future Technologies in the Field of Information and Communications,* MPHPT

(1) Direction to Be Taken by Research and Development in Japan in the Future

◇ **The use of the Internet is centered on PCs.**

- The United States, with its strength in computing and software engineering, is in the lead with the development echnologies as well.

◇ **The use of the Internet in the future will expand to non-PC devices and become ubiquitous*. The types of users will expand to include the elderly.**

- It is important to encourage R&D in the areas in which Japan is strong: mobile communications terminal technologies, intelligent home appliances, and human interfaces.

* Ubiquitous refers to the creation of a network environment that can be used at any time, from any place, by anyone.

Comparison of Japan and the U.S.A. in Technology Development in the Fields of Information and Communications

Technology	Networks			Computing	Human Factors		Software	
	Mobile Communications		Intelligent Home Appliances	Computer Systems	Voice Processing (Speech Synthesis)	Language Information Processing (Machine Translation, Etc.)	Programming Languages	Systems
	Base stations	Handsets						
Japanese technical strengths relative to the US.	×	○	○	×	○	○	×	×

Note: ○→Japan has the advantage. ×→The U.S. has the advantage.

Source: *Survey of Research in Science and Technology*, Council for Science and Technology Policy (May 2001)