WHITE PAPER

Communications in Japan
1998

Ministry of Posts and Telecommunications

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1 Growing Use of Info-Communications in Japan

1 Digitization of Info-Communications Networks

In Japan as elsewhere, the development of technology and equipment for digital information processing has resulted in the rapid growth of info-communications, broadly comprising telecommunications, broadcasting and information technology (IT). This growth has in turn led to more and more economic and other activities being carried out through info-communications networks.

2 Rising Use of Info-Communications in the Home

2.1 Indices on the Household Use of Info-Communications

The growing use of info-communications in Japanese homes can be seen clearly in the rising levels of two indices, compiled from data obtained by the Ministry of Posts and Telecommunications (MPT). The indices show that there has been significant growth in the usage of, and the amount spent on, information equipment and subscriptions to network services **(Fig. 1)**.

2.2 Growing Home Use of Info-Communications in Relation to Household Income

To discover the relationship between household income and spending on info-communications from 1971 to 1996, MPT studied the rate at which expenditure on various items increased with each 1% rise in income. The study showed that for some items, Japanese households tended to spend an amount which grew faster than income. The size of the amount was greatest in info-communications equipment, followed by info-communications services. The growth of household spending on info-communications goods and services is expected to continue to surpass the growth of household income.

3 Diffusion of Info-Communications among Households in Japan

3.1 Rising Ownership of Info-Communications Equipment

Ownership of info-communications equipment is rising in Japan. According to MPT's "Survey of the Household Usage of Telecommunication Services," (hereafter referred to as the Household Usage Survey), published in October 1997, the number of homes with word processors reached 50.0% of all households in Japan (up 8.3 points from the previous year). Household ownership of personal computers rose to 28.8% (up 6.5 points), and facsimile machines to 26.4% (up 5.7 points).

3.2 Rise in Subscriptions to Info-Communications Networks

The number of subscribers to info-communication networks has also risen. The Household Usage Survey revealed that in 1997 a total of 6.4% of households in Japan held subscriptions to Internet access services (up 3.1 points from a year earlier). The survey also showed an especially strong increase in subscriptions to mobile telephone services, with cellular telephones used by 46.0% of households (up 21.1 points from the previous year), and the Personal Handy Phone System (PHS) used by 15.3% of homes (up 7.5 points).

4 Comparison of Info-Communications Diffusion in Japan and Other Countries

In 1997, MPT performed a comparative study of the growing use of info-communications in six developed countries: Germany, Japan, Singapore, South Korea, the UK and the USA. This showed that homes in Singapore had the highest usage of telephone, PHS, radio-paging and Internet services. As for the number of households subscribing to cable television, the United States had the highest percentage, with Germany second. Those two countries stood far ahead of others in this respect. The percentage of homes with subscriptions to satellite broadcasting was highest in Germany, with Japan in second place. Households in Japan spent the highest percentage of their income on info-communications.

Fig. 1 Rising Use of Info-Communications in the Home

Index   (Baseline 100 in 1990)

Source: MPT data
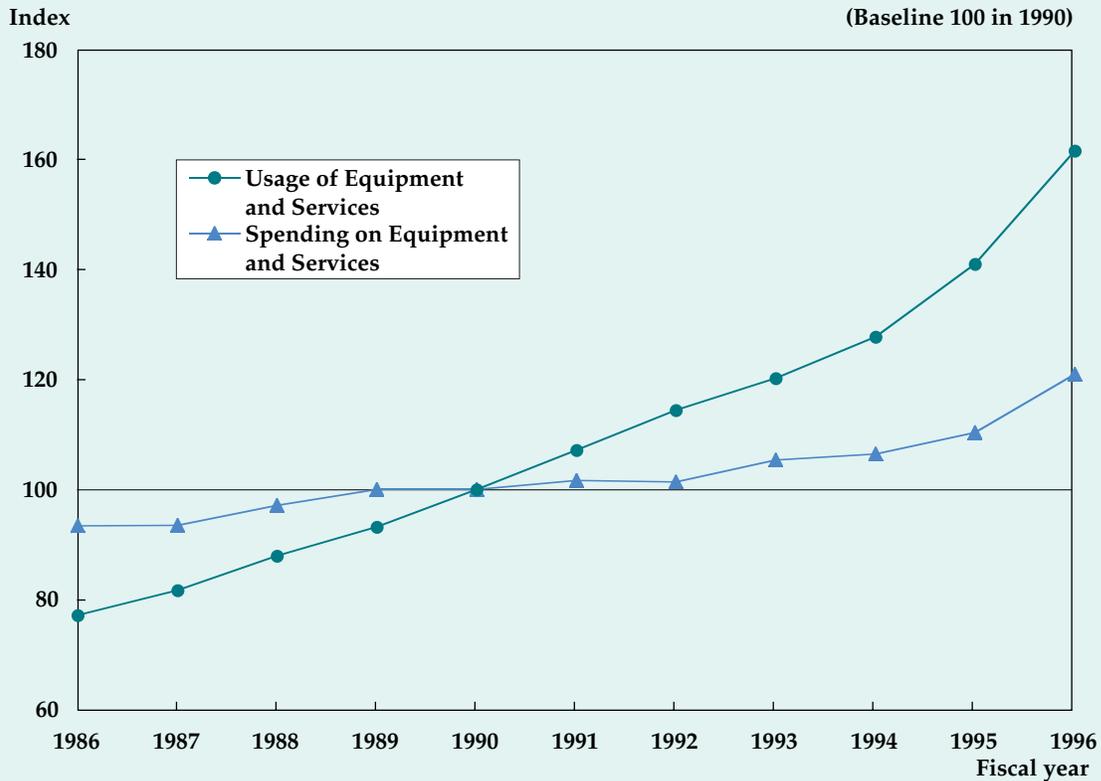
5 Forecast Growth in Information Networks

According to the "Report of the Study Group on Internet Business," issued by MPT in February 1998, the number of individual users of the Internet in Japan reached 11,550,000 in 1997. The report also reveals that the number of households using the Internet reached 2,870,000 (6.4% of the total).

By 2005, the number of individual Internet users is forecast to rise 3.6 times to reach 41,360,000, and the number of homes with access to the Internet is expected to reach 19,290,000 (equivalent to 41.8% of the total). Just as mobile telephones are already being used by nearly half the households in Japan, usage of the Internet is similarly expected to spread rapidly.

2 Info-Communications and Lifestyle

1 Changing Lifestyles in Japan and the Spread of Info-Communications

1.1 Changes in the Daily Routine and Living Expenses

The Daily Routine

Observations of the changes in the typical daily routine for people in Japan between 1986 and 1996 were reported in the "Survey on Time Use and Leisure Activities" published in 1996 by the Management and Coordination Agency. The survey showed that, in general, people spent less time on work and similar responsibilities, and more time on leisure.

Changes in Living Expenses

Changes in the expenditure patterns of Japanese households between 1987 and 1997 were described in the "Annual Survey of Household Income and Expenditure" issued by the Management and Coordination Agency. This revealed that spending rose during the period on leisure activities, transport and telecommunications.

1.2 Effect of Info-Communications on Lifestyles

The "Questionnaire on Info-Communications and Lifestyles," issued by MPT in December 1997 and hereafter referred to as the Lifestyle Survey, sampled people in Japan who possessed info-communications equipment and those who subscribed to network services. The answers indicated that use of high-tech communications equipment is not connected with an increase in free time, but that it had led users to spend an increasing amount on telecommunications.

In contrast to the results of the Management and Coordination Agency's survey of the general population, about half the respondents to the MPT survey who used mobile telephones, the Internet or personal-computer communications said they had shorter sleeping hours, while more than 30% added that they also had longer working hours. Meanwhile, over 20% of respondents using mobile cellular phones or PHS said that they had less time to spend on leisure activities.

MPT's Lifestyle Survey also showed that 50 to 60% of respondents using any type of info-communications equipment said they spent more on telecommunications, and 30 to 40% replied that they had become more sensitive to communications costs and value for money. These answers indicate that users are becoming more conscious of the charges for telecommunications and more discerning about the services they are willing to pay for.

Although the Lifestyle Survey indicated that some people may lead busier lives, it also showed that equipment such as facsimiles, PHS and the Internet enhanced the lives of many respondents. Compared with the average for all those surveyed, a higher number of users of facsimile machines, PHS and the Internet said they had exchanged more information with friends than before. They also said the scope of their activities had been widened and that they had a wider range of acquaintances outside work. It is clear that using info-communications can have a positive effect on relationships with family, friends and the community.

1.3 Effect of Info-Communications on Work and Entertainment

Using info-communications can also influence how people work. Respondents to the Lifestyle survey who used the Internet, communications by personal computer or mobile telephones were more likely to say that their working hours had increased. However, they also said that they tended to manage their time more efficiently and to make decisions after collecting much information.

Entertainment too is being strongly affected by the new media. Compared with the average respondent, users of the Internet or communications via personal computer, as well as people who held subscriptions to satellite broadcasting or cable television, more frequently said they had changed their reading habits or the time spent watching television. Such respondents also said they had a larger number of hobbies and felt more cultured and in touch with international events.

2 Info-Communications Links with Families, Friends and the Community

2.1 Background

Family Values
According to the 1995 "National Survey of Lifestyle Preferences" conducted by the Economic Planning Agency, people of every age in Japan put more emphasis on the spiritual functions of family life, rather than material concerns. For example, people tend to see mutual help and support as a more important benefit of the family than economic stability or a means for raising children

Participation in Social Welfare Activities
The "Survey of Time Usage and Leisure Activities" conducted in 1997 by the Management and Coordination Agency defines a social activity as one which promotes "the welfare of local communities, organizations or individuals by offering one's own labor, skills and time without requesting reward." According to the survey, 26.9% of respondents had taken part in such activities in the previous year.

2.2 Info-Communications Strengthens Contacts with Family and Friends

The Personal Handy Phone System
The Personal Handy Phone System (PHS) in Japan is primarily used as a way for people to communicate with their family members and friends. This is shown in MPT's 1997 Household Usage Survey, in which 66.4% of PHS subscribers cited communications with family members as one of their main reasons for using the service, while 56.9% said they mainly used it to talk with friends. The survey also showed that 15.3% of Japanese households subscribed to a PHS service, and that its usage was common among both men and women, whether in full-time paid employment or not **(Fig. 2)**. Another indication that PHS is often used for social contact is the fact that the time period with the highest rate of usage was from 8 p.m. to 4 a.m., outside usual working hours.

According to the Household Usage Survey, most PHS users said they appreciated the added ability to contact friends and family, and that the number of their calls for that purpose had tended to increase. Along with the rising number of people's social contacts outside work as well as the widening scope of leisure activities described in MPT's 1997 Lifestyle Survey, these results indicate that family ties and friendships seem to have been strengthened by the services offered by PHS.

Fig. 2 PHS User Categories

N=352
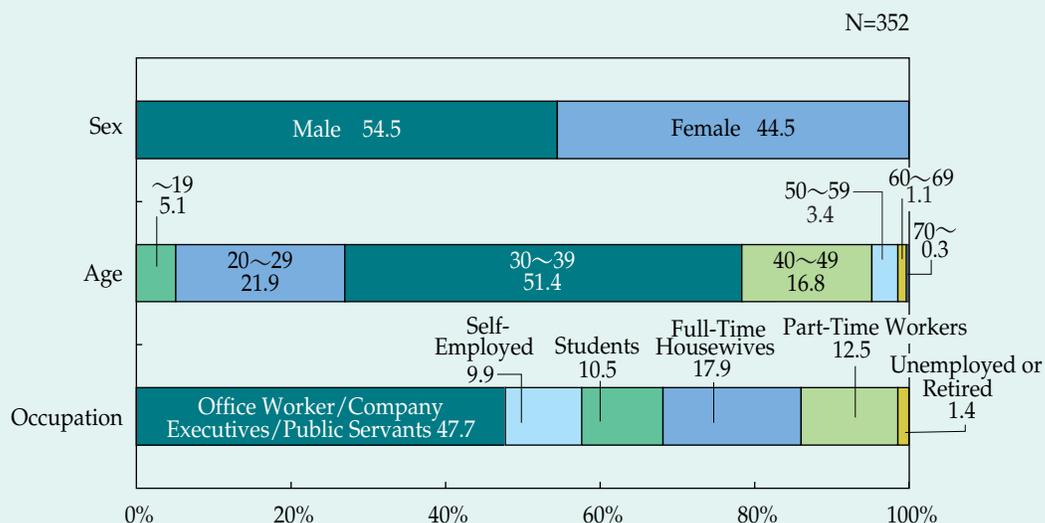
Source: MPT Lifestyle Survey (1997)

Facsimile Machines

In 1997, facsimile machines were used in 26.4% of households in Japan, according to MPT's Household Usage Survey. Overall, there was little difference in usage between men and women; however, it is noteworthy that a fairly high figure of 23.6% of full-time housewives reported regular use of fax machines in the home **(Fig. 3)**.

Almost 60% of all respondents to the Lifestyle Survey said they either frequently or sometimes used a fax machine at home, citing such purposes as mail-order shopping (44.0%), responding to questionnaires (33.8%) and obtaining various types of information (33.3%). In addition, 29.5% of respondents said they used faxes to communicate with friends, so the usefulness of facsimile machines in promoting social contact cannot be ignored. In fact, there is a clear trend for owners of facsimile machines to report that their lifestyles have changed to include more frequent communications with family and friends, as well as greater interest in community issues and volunteer activities.

2.3 Info-Communications and Community Groups

Up to now, members of community groups in Japan have usually kept in touch with each other by conventional telephones, sometimes through access to a service providing public announcements that can be heard simultaneously by many callers. Nowadays, however, new ways to share information, such as Internet homepages and electronic mail, are creating new types of community networks.

2.4 Info-Communications and Voluntary Activities

Printed magazines and newsletters are still a major means for members of voluntary groups in Japan to keep informed of their activities. Increasingly, however, volunteer groups are using Internet homepages and bulletin boards to exchange information among their members, as well as to publicize the groups among the general public. This trend is being promoted by demand from people wishing to join volunteer groups or to have details of their programs. Clearly, ties between those groups and their members, as well as with the public in general, have been strengthened through developments in info-communications.

2.5 The Benefits and Challenges of Info-Communications and the Community

We have seen that the development of info-communications networks in Japan has enabled people to exchange information anywhere and at any time. In addition to helping business, this has resulted in strengthened ties among families and friends, as well as a growing number of networks linking those who share social concerns, easier communications among voluntary organizations and further promotion of their activities.

However, in order to enjoy the full benefit of info-communications, challenges must be faced, such as the need to cut the costs of communications, as well as to improve people's skills in using info-communications equipment.

3 Info-Communications and Employment

3.1 Background

Working Hours
Since the amendment of the Labor Standards Law in 1988, which introduced a 40-hour working week as standard in Japan, total working hours have been falling and now stand at their lowest level since the end of World War II.

The Aging Working Population
In 1990, the percentage of workers aged 55 or over in the Japanese workforce surpassed that of the United States and of major European countries. It is estimated that the percentage of older workers will continue to rise in Japan.

Longer Commuting Distances
There has been an increase in the average distance between a worker's home and his or her place of work.

3.2 Info-Communications and Patterns of Work

Mobile Cellular Telephones
In contrast to PHS, people in Japan use mobile cellular telephones more at work than in their private lives. This is shown in MPT's 1997 Lifestyle Survey, in which 50% of users of cellular phones said they did so primarily to raise their working efficiency. In addition, the Household Usage Survey showed that in 1997, of the 46.0% of homes

possessing cellular phones, 68.9% said more than half their calls were for work purposes.

People who used cellular phones most frequently reported the most significant rise in the efficiency of their work. Cellular telephones allow a person to receive calls almost anywhere, so users can carry on with their jobs wherever they are, thus increasing productivity.

Fig. 3　User Categories of Facsimile Machines

N=670

Category		
Sex	Male 50.8	Female 49.2

Age:
- ～19: 2.2
- 20～29: 14.3
- 30～39: 47.2
- 40～49: 18.2
- 50～59: 10.4
- 60～69: 6.1
- 70～: 1.5

Occupation:
- Office Workers/Office Executives/Public Servants: 39.3
- Self-Employed: 18.2
- Students: 3.6
- Full-Time Housewives: 23.6
- Part-Time Workers: 10.7
- Unemployed or Retired: 4.5

0%　　20%　　40%　　60%　　80%　　100%
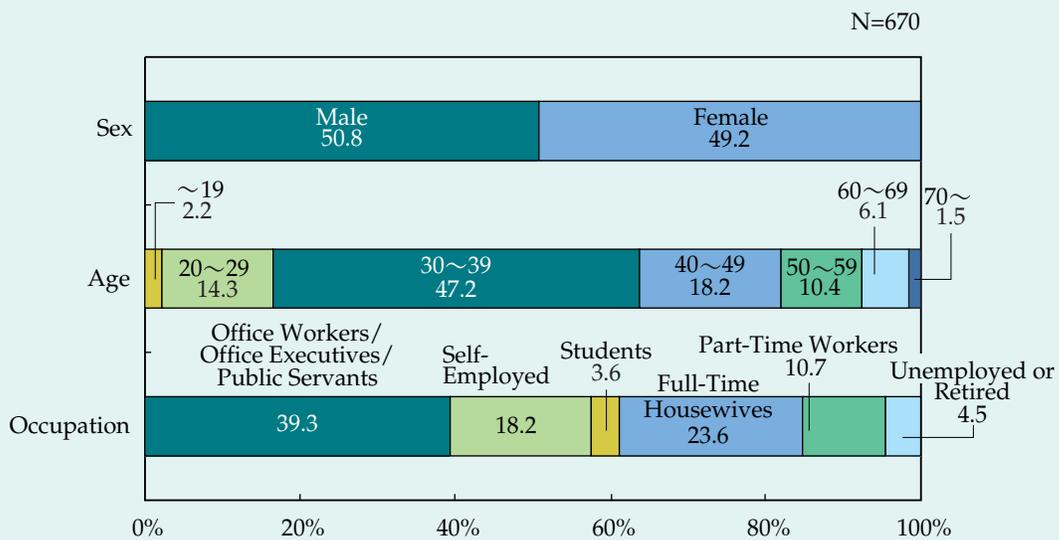
Source: MPT Lifestyle Survey (1997)

The Internet

The Internet is used for both private and business purposes. However, it appears that business use is dominant in Japan, and that there has been a rapid rise in the number of companies installing Internet connections. According to MPT's 1997 "Survey of Telecommunications Usage by Businesses" (hereafter referred to as the Business Usage Survey), 11.7% of companies in Japan had access to the Internet in fiscal 1995. This figure rose sharply to 50.4% in fiscal 1996 and 68.1% in fiscal 1997. In particular, Internet connections spread rapidly in the financial and the insurance sector, as well as among manufacturers.

These results are confirmed by MPT's 1997 Lifestyle Survey, which found that 14.2% of respondents used the Internet for business purposes, while 18.1% did so for a mixture of business and private reasons. According to the survey, 32.8% of respondents said higher work efficiency was the main benefit of using the Internet, while 21.1% cited its ability to enable people to work from home. As for business usage of the Internet, the Lifestyle Survey showed that information collection accounted for 67.7% of usage and communications and consultation accounted for 30.2%. This reflects the efficiency of the system in searching for information and in communicating with others in Japan and worldwide, a result that is underlined by the 84.3% of respondents who said the Internet raised the efficiency of collecting information, the 68.9% who said it helped information to be exchanged more quickly and the 49% who said it made it easier to contact users overseas.

3.3 Telework

The term "telework" means using info-communications of various types to work from home or another location outside main business premises. Occupations that are most suited to telework are those which can be performed on an individual basis, such as the preparation of proposals and reports, research, design, translation and data calculation and entry. It is estimated that 809,000 people in Japan worked at least once a week in this way in 1996, according to the "Survey of People in Telework" conducted by The Satellite Office Association of Japan.

3.4 Benefits and Challenges of Info-Communications and Employment

Benefits

The advance of info-communications can enhance business efficiency and productivity. In addition, it helps to reduce stress by allowing telework and the resulting decrease in commuter traffic cuts environmental pollution. Furthermore, developments in info-communications can improve job opportunities for older workers and people with disabilities.

Challenges

Nevertheless, issues remain to be solved, such as raising the speed of transmission for video data and cutting communications fees. In addition, it is also important to establish ways to manage the new patterns of work created by new technologies.

4 Info-Communications and Entertainment & Leisure

4.1 Background

The leisure time of Japanese people has been steadily increasing, according to the "National Time Use Survey" conducted in 1995 by the NHK Broadcasting Culture Research Institute. However, the survey also revealed that the time spent watching television rose between 1990 and 1995, having previously shown a slight fall between 1980 and 1990. According to the survey, people in Japan spend almost 80% of their weekday leisure time watching television, and almost 70% at weekends.

4.2 Entertainment

Satellite Television Broadcasting and Cable Television

The 1997 Lifestyle Survey by MPT showed that satellite television broadcasts were watched mostly by men in their 20s, 30s and 40s, while cable television tended to attract viewers in their 40s, 50s and 60s, about a quarter of whom were women **(Figs. 4 and 5)**.

According to the survey, 64.4% of the satellite broadcasting audience and 83.8% of cable television viewers said they watched programs on eleven or more channels, suggesting that channels specializing in specific topics are chosen, rather than channels offering a more general service. Most viewers of both types of service said they enjoyed the programs they saw, either as much or more than they had

anticipated. The most popular broadcasts for both services were those featuring entertainment or hobbies, while cable television viewers also particularly liked news and weather programs closely linked to their local areas.

Fig. 4   Categories of CS Broadcasting Users

N=146

Sex	Male 84.1 / Female 15.9
Age	~19 1.4 / 20~29 23.3 / 30~39 31.5 / 40~49 21.9 / 50~59 9.6 / 60~69 10.3 / 70~ 2.0
Occupation	Office Worker/Company Executives/Public Servants 63.7 / Self-Employed 15.1 / Full-Time Housewives 4.8 / Students 2.1 / Part-Time Workers 2.7 / Unemployed or Retired 11.6

0%   20%   40%   60%   80%   100%
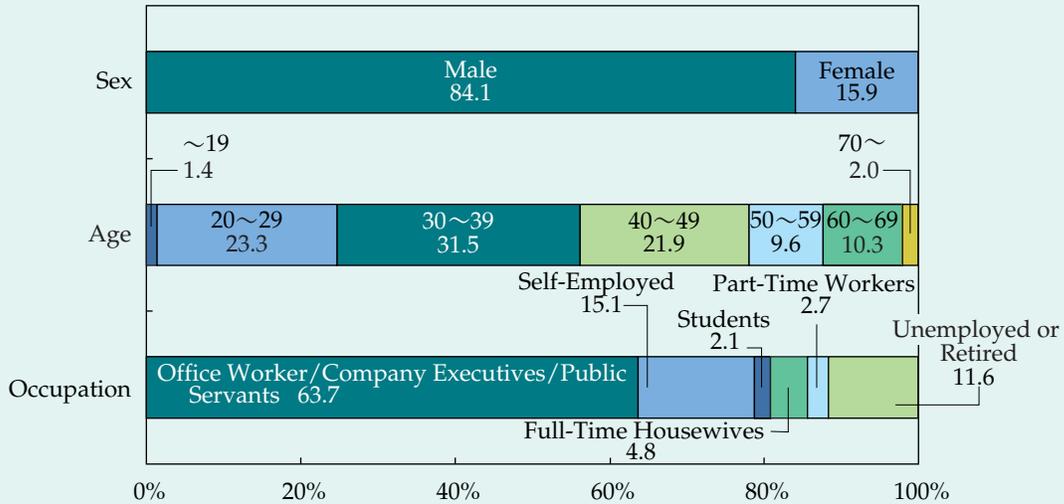
Source: MPT Lifestyle Survey (1997)

Fig. 5 Categories of Cable TV Users

N=169

Sex	Male 75.0 / Female 25.0
Age	~19 2.4 / 20~29 5.4 / 30~39 11.3 / 40~49 14.9 / 50~59 32.1 / 60~69 26.2 / 70~ 7.7
Occupation	Office Worker/Company Executives /Public Servants 53.6 / Self-Employed 14.5 / Full-Time Housewives 11.4 / Students 5.4 / Part-Time Workers 2.4 / Unemployed or Retired 12.7

0%   20%   40%   60%   80%   100%
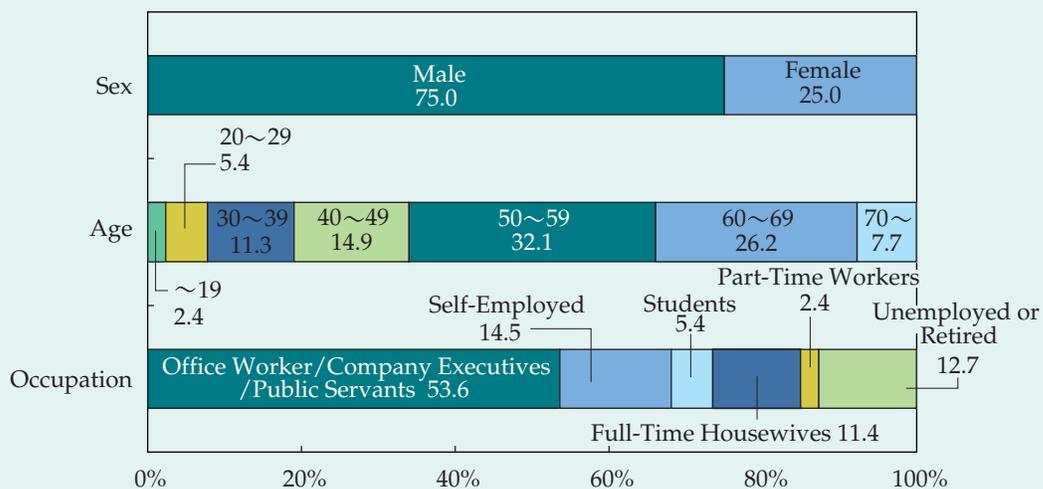
Source: MPT Lifestyle Survey (1997)

The Internet and Communications by Personal Computer

According to MPT's Lifestyle Survey, in Japan, men form the great majority of leisure users of the Internet and communications by personal computer. In addition, the number of users aged 60 or more is extremely small **(Fig. 6)**.

The survey revealed that users were generally happy with the services when used for entertainment or leisure purposes, with 63.0% of Internet users expressing satisfaction and 63.2% of people communicating via personal computers. For both services, 65.0% of users said they wanted to continue to use them.

4.3 Benefits and Challenges of Info-Communications and Leisure

Benefits

The development and spread of new media have greatly enlarged the scope of entertainment in Japan. The diversification of broadcasting channels has made a bigger selection of programs available, meeting the specific needs of particular audiences. Meanwhile, the Internet has made it much easier for users to collect information and have access to entertainment. It also allows people to contact others worldwide, and thus has great potential for enriching human relationships.

Challenges

However, in the field of entertainment and leisure, info-communications still faces challenges. These include insufficient supply of programs and high access charges, as well as unsatisfactory transmission rates and capacities and the need to protect privacy and security.

5 Info-Communications and Shopping

The effect of advancing info-communications upon shopping is analyzed in the Survey of General Consumers and the Survey of Internet Users, published by MPT in 1997.

5.1 Background to Mail-Order Shopping

The amount of mail-order business by companies in Japan has been steadily increasing since 1983, and in 1995 it was worth 2.1 trillion yen, representing 1.46% of all retail sales. According to the Survey of General Consumers, a comparatively large ratio of 40.6% of respondents said they had ordered goods or services by mail at least once in the past. The largest group among these respondents comprised women in their 20s and 30s.

5.2 Internet Shopping

Awareness of Internet Shopping

In the Survey of General Consumers, 64.8% of respondents said they were aware that goods and services could be bought via the Internet, but only 1.3% had actually made purchases. This group was mostly comprised of men, in contrast to shoppers by conventional methods of mail order, who were mostly women.

The Survey of Internet Users showed that 36.3% of respondents had bought goods at least once through the Internet **(Fig. 7)**, but that almost two-thirds had never done so.

Goods Bought via the Internet

According to the Survey of Internet Users, the types of goods and services purchased through online shopping were mainly computer hardware and software, followed by books and other categories such as food.

5.3 Future Trends in Internet Shopping

Advantages of Internet Shopping

Both the survey of general consumers and the survey of Internet users showed that most people see the main advantages of Internet shopping as not needing to leave home and being able to shop at any time of day. In the case of Internet users, other answers were also given by a large number of respondents. A total of 59.5% said they liked being able to place orders no matter what their location, while 37.8% said they appreciated being able to search for a product or service at the lowest possible price.

Potential Users of Internet Shopping

MPT's Survey of General Consumers also showed that many people in Japan want to shop online. Almost 40% of male respondents in their 20s to 40s showed a strong wish to do so, as well as 50.7% of women in their 20s and 42.9% of women in their 30s. Already, there are many women among the clients of conventional mail-order businesses, clearly making them targets for expansion of Internet shopping.

Fig. 6 Categories of Internet Users

N=221
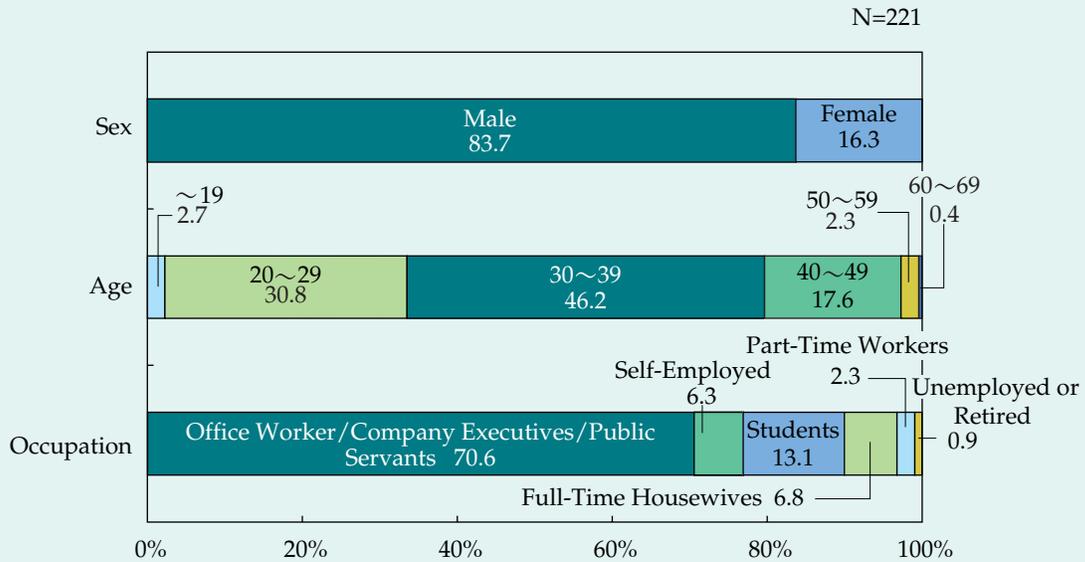
Source: MPT Lifestyle Survey (1997)

Fig. 7 Shopping by Internet Users

No answer
(2.1%)

Have bought goods
via the Internet
(36.3%)

Have never bought
goods via the Internet
(61.6%)
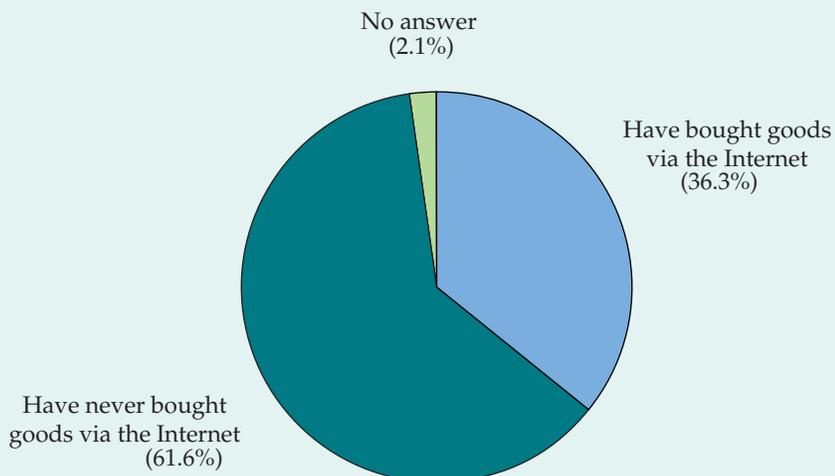
Source: MPT Survey of Internet Users (1997)

Target Products of Internet Shoppers

The Survey of General Consumers and the Survey of Internet Users each show an impressive range of products which respondents said they would like to buy online. These include tickets for air and train travel, hotel reservations and concert tickets **(Fig. 8)**. People who were already Internet users were very strongly interested in buying further computer equipment and software.

5.4 Conditions for Promoting Internet Shopping

The two surveys indicate several ways in which Internet shopping could be made more attractive by answering consumers' concerns. As regards general consumers, 33.8% were concerned about how to operate a personal computer, or were not confident about accessing the Internet, and 11.6% wanted to see a cut in the prices of personal computers. Among existing Internet users, 30% looked for more reliable means of paying bills, while 19% sought greater protection of privacy. Additionally, 9.6% hoped to see a cut in communications fees, a response echoed by 7.2% of the general consumers surveyed.

In several respects, these results from consumer surveys are in sharp contrast to the responses in a similar survey of providers of Internet retail services, published by MPT in 1997. The Survey of Electronic Commerce found, for example, that although a similar percentage of companies saw a need for improvement in people's ability to operate a personal computer and to access the Internet, the need for better protection of privacy was cited by only 2.3% of respondents as being a hindrance to further commercial expansion **(Fig. 9)**.

5.5 Benefits and Challenges of Info-Communications and Shopping

Because its advantages are already perceived by many people, it is expected that Internet shopping will continue to grow in Japan, especially among female consumers. However, that growth will to some extent depend on improving users' computer skills, while also making equipment easier to use, at the same time as ensuring greater security and privacy in online services and payment systems.

6 Info-Communications and Education

6.1 Background

Developments in info-communications have influenced education in Japanese schools, colleges and universities through such means as the creation of computer networks. Additionally, this trend has helped to expand education outside conventional institutions, providing people of all ages with increasing opportunities for lifetime education.

6.2 Info-Communications in Schools

Primary and Secondary Schools

In fiscal 1996, over 90% of Japan's state primary and secondary schools were equipped with computers for educational purposes, but other essential elements remained lacking. Only 19.7% of teachers in state schools were qualified to teach children computer skills, and as of May 1997, only 9.8% of schools had access to the Internet. In comparison, 78% of state schools in the United States were connected to the Internet in 1997.

Institutions of Higher Education

Japan's universities and other institutions of higher education continue to establish and improve info-communications networks. Recent progress in image transmission using communications satellites and ISDN circuits has made it possible for interactive teaching to be conducted between distant campuses or other locations. In line with this trend, the Ministry of Education, Science, Sports and Culture has inaugurated management systems such as ways to offer study credits to students far afield.

Adult Education

There is general recognition of the need to expand opportunities for people of all ages to study in various ways, and info-communications is making a big contribution to this process. At the beginning of 1998, for example, the University of the Air Foundation started digital broadcasting by communications satellite, which can be received nationwide. In total, seven satellite television channels now focus on education and training, representing 7.1% of all satellite channels offering services in Japan.

Fig. 8 Target Products of Internet Shoppers

Legend: Current Internet Users; General Consumers

Categories (top to bottom):
Clothing
Jewelry and Precious Metals
Furniture, Home Electrical Appliances, Household Utensils
Hobby-Related Equipment
Computer Hardware and Software
Music CDs, Videos, etc.
Cosmetics and Medicines
Books, Magazines and Stationery
Food
Alcohol
Plane and Train Tickets
Hotel Reservations
Concert and Theatre Tickets
Information Services
Financial Products
Administrative Services

X-axis: 0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 (%)

Source: MPT Survey of General Consumers (1997) and Survey of Internet Users (1997)

Fig. 9 Factors Seen as Promoting Internet Shopping

Legend: Companies Selling via the Internet; Current Internet Users; General Consumers

Categories (top to bottom):
Improved Computer Skills
Reduction in Prices of Personal Computers
Reduction in Communication Fees
Lower Prices of Goods Bought via the Internet
Correct Price Information on Advertisements
Reliability of Companies Offering Goods
Reliability of Online Payment Systems
Protection of Customers' Privacy
Easy Return or Exchange of Goods
Good After-Sales Service

X-axis: 0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 (%)

Source: MPT Survey of General Consumers (1997), Survey of Internet Users (1997),
and Survey of Providers of Internet Retail Services (1997)

Interest in Education through Broadcasting

The Lifestyle Survey conducted by MPT in 1997 asked subscribers to satellite broadcasting and cable television services for their views on educational programs. Among the subscribers to cable television, 13.6% said they appreciated programs giving lessons in English and other foreign languages, and the same percentage said they liked adult education broadcasts in general. For subscribers to satellite television, the respective figures were 11.2% and 4.2%. As for the programs by the University of the Air Foundation broadcast by communications satellite, 26% of respondents said they sometimes enjoyed watching them, and 3.3% said they had become interested in enrolling in the university **(Fig. 10)**.

6.3 Benefits and Challenges of Info-Communications and Education

Benefits

Progress in info-communications has created a growing number and diversity of opportunities for education in the classroom, at distant campuses and at home. Through linking primary and secondary schools with the Internet, children will be better able to improve their information literacy, no matter how remote their communities are.

Challenges

Technical and policy challenges remain, however. The reliability and capacity of technology must be improved and the fees for network services reduced. Additionally, it is necessary to find ways to prevent primary and secondary schoolchildren from coming into contact with material on the Internet which might be harmful to them.

7 Medical Care and Social Welfare

7.1 Background

Japan's Aging Society

According to "Population Projections for Japan" published in January 1997 by the National Institute of Population and Social Security Research, by 2015 there will be 31.88 million people in Japan aged 65 years or older, equal to more than 25% of the population as a whole.

Limited access to medical care in thinly populated areas

Although most communities in Japan have satisfactory access to medical services, there is still a significantly high number of thinly populated areas where residents have difficulty in reaching a doctor quickly.

7.2 Info-Communications and Medical Care

People's Expectations

According to MPT's Household Usage Survey, 40.8% of all respondents looked forward to being able to consult a doctor remotely through a computer link from their homes. The percentages were higher among older people, with 43.7% of those in their 50s hoping to use such a service, and 55.3% of those aged 60 or older. This demand for medical services through info-communications was much higher than for other types of service **(Fig. 11)**.

Current Use of Info-Communications in Medical Care

In November 1997, MPT conducted a survey of 3,255 municipalities across Japan, including central Tokyo. The survey revealed that 46.3% of the municipalities operated an emergency communications system that covered medical needs. However, only 3.2% used info-communications systems to offer information on public health, medical care and welfare, while the number operating an online consultation service on those topics was even smaller at 0.9%.

7.3 Telemedicine

According to the final report of a Ministry of Health and Welfare study group on remote medical treatment through info-communications, issued in March 1997, "telemedicine" should be defined as medical practice and diagnosis carried out from a remote location through using info-communications systems to transmit information on patients, including images. Through telemedicine, such data as blood pressure, pulse rate and body weight can be sent to a hospital from a patient's home, providing the basis for continuing health care. By allowing people with medical problems to be supported in their own homes, the system contributes significantly to improving the quality of life of patients and their families. Furthermore, advances in info-communications bring the possibility of new medical treatments.

Fig. 10 Interest in CS Broadcasts by the University of the Air Foundation

Interested in enrolling
in the university
(3.3%)

No answer
(19.1%)

Enjoy watching programs
(26.0%)

N=215

Not specially interested
(51.6%)
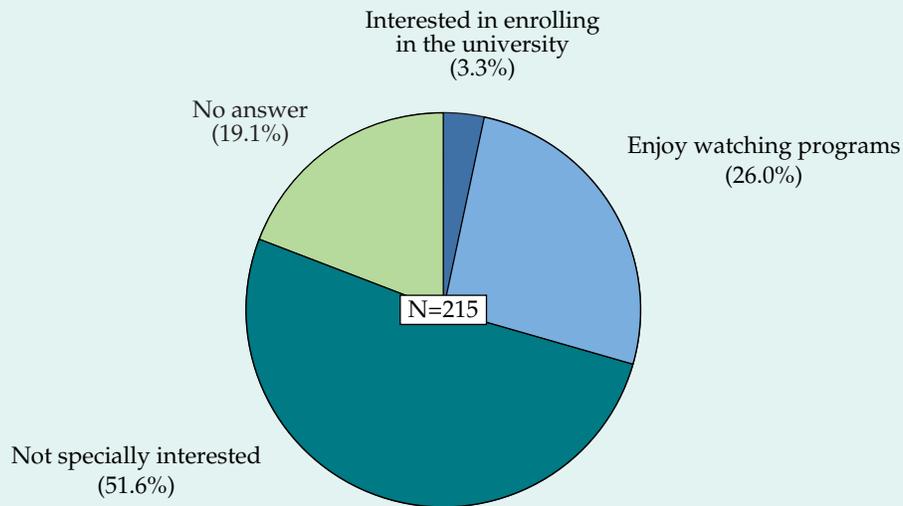
Source: MPT Lifestyle Survey (1997)

Fig. 11 Online Services Available at Home

Service	%
Consultation with a Doctor and Diagnosis	40.8
Video on Demand	28.3
Administrative Services and Reservation of Public Facilities	26.7
Balance Inquiry and Money Transfer Through a Bank or Post Office	24.2
Cultural Activities	21.0
Video-Telephone	14.2
Telework and Remote Education System	10.6

(%)
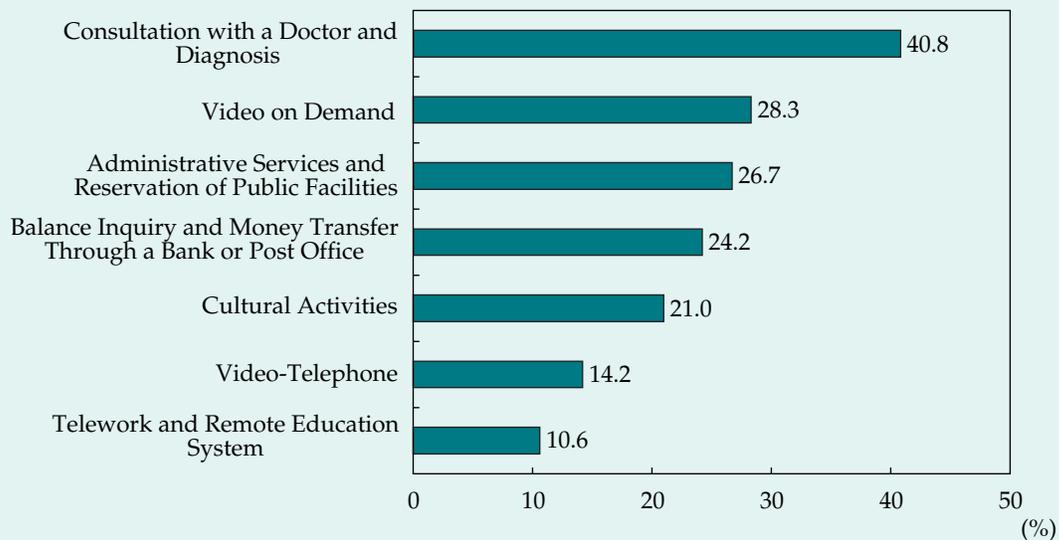
Source: MPT Household Usage Survey (1997)

Benefits

If a national network for telemedicine were established in Japan, regional differences in medical treatment could be corrected and the efficiency of medical practice could be improved. For example, unnecessary hospital admissions could be avoided, while patients would have the reassurance of contact with medical staff. It would even be possible for patients to consult specialists overseas.

Challenges

For telemedicine to be implemented fully in Japan, telecommunications infrastructure must be developed to transmit images more clearly at a higher speed. In addition, reliable systems must be in place to protect patients' privacy.

7.4 Social Welfare of Elderly or Disabled People

Ownership of Info-Communications Equipment among Elderly People

The Household Usage Survey by MPT showed that between 1995 and 1997, there was explosive growth in the number of people aged 60 or more who owned PHS equipment. For every elderly PHS-user in 1995, there were 44 in 1997. Over the same period, the number of respondents aged 60 or more owning mobile cellular telephones rose by a factor of 4.9, while ownership of personal computers went up 2.4 times and ownership of facsimile machines by a factor of 1.4.

Benefits

Info-communications systems, such as video-telephones, personal computers and the Internet, can help elderly or disabled people to remain independent and to enjoy a wider range of both social and work opportunities.

Challenges

In order to achieve the full potential of info-communications in assisting social welfare, equipment and software must be designed which can be easily used by anyone, including elderly and disabled people. Moreover, better support systems will be needed to help users if they have queries or problems in using info-communications technology.

8 Info-Communications and Local Government

8.1 Background

Progress of Info-Communications in Administration

Looking back, we can see that there has been a gradual intensification in both the national and local governments' use of info-communications since efforts first began in that direction in the 1960s. By the early 1990s, many administrations had begun to operate information systems, and info-communications services continue to be used widely and to be improved in response to local residents' needs.

National Government Measures

The Japanese government has undertaken measures, such as the "Basic Plan for Promoting Administrative Informatization," to increase the use of information technology in administrative procedures. This is aimed at improving efficiency by, for example, electronic storage of documentation and the introduction of "paperless" offices.

8.2 Use of Info-Communications in Local Government Administrative Services

According to MPT statistics, by November 1996, local government administrations in Japan had introduced a total of 4,457 information networks. The largest share of these were online systems for administrative services and consultations, while there was also a growing number of library information networks. In addition, systems to give information during times of emergency or natural disaster were also becoming more common, especially following the Great Hanshin-Awaji Earthquake in western Japan in January 1995.

Local Government Internet Homepages

Japan's administrative sector is using the Internet more and more to share information with local citizens, as well as people far afield. By 1996, a total of 18.4% of cities, towns and villages had opened their own Internet homepages, and by 1997, all prefectural governments had done so.

However, according to MPT's Lifestyle Survey, many people were unaware of the existence of the local government homepages and they were visited by only 20% of all respondents who had access to the Internet. With the exception of tourism, as well as regular details of local events and administrative information, there appears to be a

discrepancy between relatively high demand for information on such areas as disaster prevention, public health and education, but limited actual use of the homepages **(Fig. 12)**. This suggests that the content of the homepages remains unsatisfactory or insufficiently publicized.

Fig. 12 Usage and Demand for Local Governments' Internet Homepages
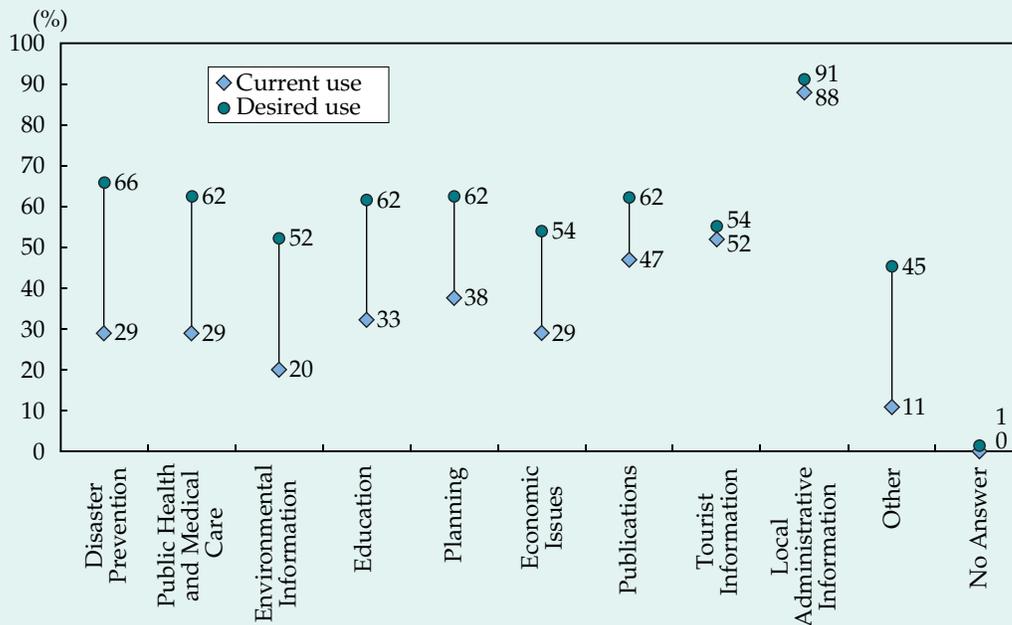
Source: MPT Lifestyle Survey (1997)

Cable Television

Cable television has been increasing in importance as a way for local governments to provide administrative information in areas where residents have previously relied solely on the circulation of printed materials. According to MPT figures, people living in areas where cable television is available list it in third place as a means to obtain administrative information, behind printed brochures and notices from residents' associations.

Demand for Administrative Services

MPT statistics also show that many people in Japan expect to find advantages in the implementation of online administrative services. In particular, people looked forward to the lifting of restrictions on service hours and the ability to complete many procedures at one time using a "one-stop" terminal.

8.3 Benefits and Challenges of Info-Communications and Administration

Benefits

Info-communications technology makes it possible to improve administrative services to the public by offering them at any time of day and from a multitude of locations. The one-stop service in particular can bring significant benefits to users and in future, information systems are expected to become a powerful means for increasing citizens' participation in their local administrations.

Challenges

In order to promote the use of networks such as the Internet to enhance administrative services, it is necessary to develop improved techniques for user identification and protection of privacy, as well as to develop a legal framework to cover the

new systems. Meanwhile, local governments must make efforts to install terminals in as many public places as possible, with software that is easy to operate, so that all residents can have access to online administrative services even if they do not own a personal computer or know much about how to use one. At the same time, and with the needs of the public in mind, the information literacy of municipal employees must be improved alongside the increasing use of info-communications by local governments.

3 Information Literacy

1 Information Literacy

Info-communications is a tool for development in all sectors of an economy, as well as in society as a whole. As the use of such technology advances and information networks spread, there is a worldwide need to improve the skills that are needed to use info-communications effectively. Those skills have been called "information literacy."

1.1 Definition of Information Literacy

In a narrow sense, information literacy can be defined as the ability to operate the relevant equipment to a satisfactory standard. In a broader sense, it can be defined as also having the ability to understand how computers can be used to analyze data, as well as the ability to select and process information on one's own initiative.

In this White Paper, the term information literacy is used in the broad sense, implying a person's ability to adapt successfully to a society that makes full use of digital information networks. In addition, this paper divides information literacy into three types: (1) basic information literacy, (2) PC literacy (ability to use a personal computer), and (3) network literacy (ability to use networks such as the Internet).

1.2 Comparison of Information Literacy in Japan and the United States

Between December 1997 and January 1998, MPT conducted a survey of 600 people in Japan and 600 in the United States, aged between 15 and 69, to assess the general level of information literacy in the two countries. As well as covering general matters, the survey included a set of test questions.

This gave a score of one point for each of eight items on basic information literacy and seven items covering PC and network literacy, giving a possible total score of 15.

Average Overall Scores
The results of the survey showed an average score of 8.29 for respondents in Japan, and 8.97 for those in the United States. This relatively small average gap disguises some significant differences in the distribution of scores **(Fig. 13)**.

Highest and Lowest Overall Information Literacy
Among Japanese respondents, a typical person showing higher information literacy was a man living in a city, who had a university degree and a higher than average income. However, in the United States, although people with high scores in information literacy also tended to have a university degree, no clear distinction could be made regarding sex, residential area or annual income.

Among both the Japanese and US respondents, those who produced the lowest scores in information literacy tended to be in their 60s and to have a lower educational background and a lower annual income than average. Men and women were almost equally represented in this group in the United States, but in Japan the group contained mostly women.

Analysis of Each Type of Information Literacy
The level of basic information literacy was assessed by examining the average scores obtained for the eight questions posed in that area. No significant gap was found between the levels of basic information literacy of Japanese and US respondents. However, a gap became clear when

a similar procedure was used to examine the levels of PC literacy and network literacy. Also, there was a noteworthy gap between young people in Japan and the United States, as well as in the degree of distinction between the sexes with regard to information literacy **(Fig. 14)**.

Fig. 13 Overall Information Literacy in Japan and the United States

Percentage of Total Respondents
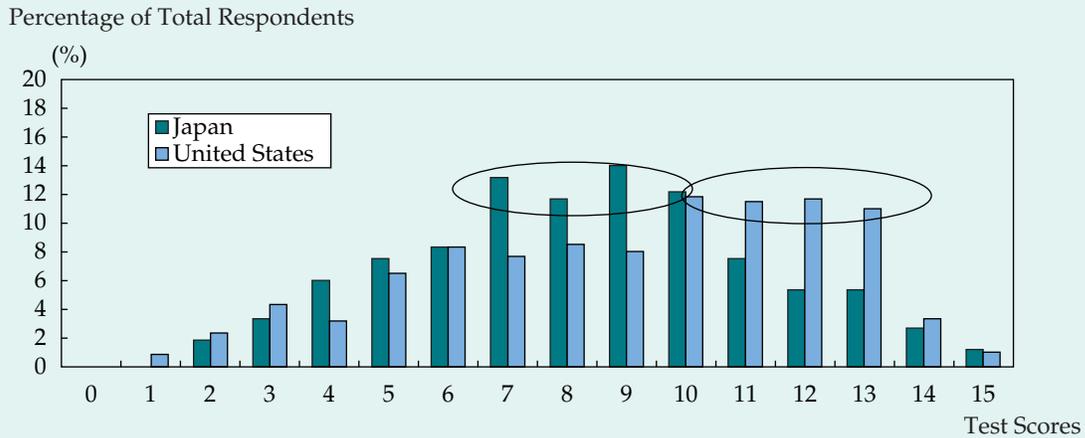
Source: MPT Survey on Information Literacy in Japan and the US (1997/98)

Fig. 14 Information Literacy among Young People and Women
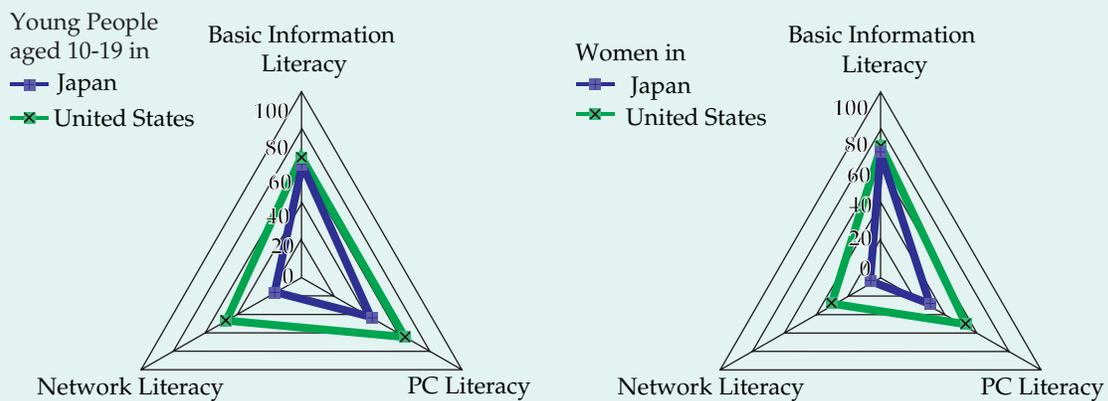
Source: MPT Survey on Information Literacy in Japan and the US (1997/98)

Factors behind the Gaps in Information Literacy

One likely factor behind the gap between the levels of PC and network literacy in Japan and in the United States is the difference in the number of households with access to the Internet, which is much higher in the United States. This is also seen as contributing to the gap in information literacy between young people in the two countries, along with the much lower number of schools in Japan which have Internet access. The differences between the two countries in the information literacy of women could be accounted for by the fewer opportunities available to Japanese women to develop the necessary skills, due to their lower level of employment outside the home.

1.3 Analysis of Information Literacy in Japan

Gaps between the Sexes and Age Groups

The results of the comparative survey regarding Japanese respondents are shown in Figure 15. People in their 20s obtained the highest average score for information literacy of 9.73 and those in their 60s obtained the lowest average score of 6.22, indicating a significant generation gap. There was also a clear difference between the sexes in Japan. Men obtained a higher average score of 9.02 while women obtained a score of 7.29. Place of residence had relatively little effect, with respondents living in Japanese metropolitan areas obtaining an average score of 8.58, against 7.99 points for people living in small towns or the countryside **(Fig. 15)**.

The Importance of Motivation

Motivation to learn about info-communications is a strong factor in the level of information literacy a person will attain. It also helps to have someone who can advise you. The survey showed that people in Japan who received such advice achieved higher information literacy scores.

Factors behind Gaps in Information Literacy in Japan

The biggest gap in information literacy among Japanese respondents is related to age, with people in their 20s scoring significantly more than those in their 50s or older. This may be caused partly by the fact that chances to improve information literacy are connected with work opportunities, thus excluding retired people.

There is also a large disparity between the sexes in Japan with regard to information literacy, possibly again reflecting a difference in access to paid employment.

1.4 Ways to Improve Information Literacy in Japan

Because of the complexity of designing word processors to cope with Japanese writing systems, it is only in the last ten years or so that most people in Japan have had the opportunity to gain keyboard skills. This may be an influence on information literacy levels, especially among older people. Operation of computers and access to the Internet would be encouraged if it were made easier for people in Japan to learn keyboard skills.

Secondly, it is important for children to be educated in information literacy at school, especially regarding use of communications networks.

Thirdly, an environment should be created which enables elderly and disabled people to share in the advantages of info-communications, for example by installing appropriate equipment in places such as post offices and public libraries.

Fourthly, women who are not in full-time paid work should be assisted to participate in information networks through the promotion of links to the home.

Fig. 15 Information Literacy in Japan

Age	Sex	Residential Attribute	Average Score
10-19	Male	Major Cities	9.23
10-19	Male	Elsewhere	7.83
10-19	Female	Major Cities	7.29
10-19	Female	Elsewhere	7.00
10-19 Total			8.02
20-29	Male	Major Cities	10.60
20-29	Male	Elsewhere	11.40
20-29	Female	Major Cities	8.64
20-29	Female	Elsewhere	8.22
20-29 Total			9.73
30-39	Male	Major Cities	10.40
30-39	Male	Elsewhere	10.00
30-39	Female	Major Cities	8.54
30-39	Female	Elsewhere	8.19
30-39 Total			9.28
40-49	Male	Major Cities	10.00
40-49	Male	Elsewhere	9.26
40-49	Female	Major Cities	7.75
40-49	Female	Elsewhere	6.59
40-49 Total			8.41
50-59	Male	Major Cities	9.64
50-59	Male	Elsewhere	8.11
50-59	Female	Major Cities	7.14
50-59	Female	Elsewhere	6.81
50-59 Total			7.94
60-69	Male	Major Cities	7.57
60-69	Male	Elsewhere	6.44
60-69	Female	Major Cities	5.54
60-69	Female	Elsewhere	5.32
60-69 Total			6.22
Male Average			9.02
Female Average			7.29
Average for Major Cities			8.58
Average Elsewhere			7.99

Source: MPT Survey on Information Literacy in Japan and the US (1997/98)

4 Issue for Action

With the advance of info-communications, various issues have emerged which must be resolved if the advantages of a digital network society are to be realized. These issues mainly concern the privacy and security of transmissions via communications networks.

1 Ensuring the Security of Network Services

Ensuring the security of networks and developing adequate complaint procedures were among the items considered by the MPT Study Group on Developing a Legal Environment for the Advanced Info-Communications Society, which issued a report in March 1998.

1.1 Protection of Privacy

The study group's report stated that substantive measures must be taken to protect the privacy of network users. It proposed that action should be taken by the private sector and that the Japanese government should consider implementing a comprehensive law on privacy protection.

1.2 Measures against Unauthorized Access

With the growth of networks, there is likely to be an increasing problem of unauthorized access to information carried on those networks. As measures against this, the study group's report suggested that a new legal framework should be considered which would inhibit unauthorized access, while at the same time technology should be developed that can keep networks secure.

1.3 Establishing Systems for Answering Complaints

The report also proposed that systems established to answer complaints from network users must follow certain guidelines. Specifically, the systems should not only provide a consultation and settlement service for users who suffer damages through networks; they should also provide a means of collecting constructive opinions from users in general, thus allowing their participation in the policymaking process. To achieve this, relevant information should be actively provided for users, so that they can contribute positively to the development of info-communications.

1.4 Electronic Commerce

Telecommunications carriers play a crucial role in using advanced technology to create secure and reliable systems for electronic commerce which users can trust. However, further study is needed of how responsibilities in this area should be shared between such carriers and businesses offering electronic commerce, including questions of compensation to customers following such problems as incomplete transfer of data.

2 Information Distribution on the Internet

In December 1997, MPT published "Guidelines on Information Distribution on the Internet," which included a definition of the liabilities of telecommunications carriers in that regard.

The document listed a number of measures, including application of current laws to illegal distribution of information via the Internet, restrictions on the anonymity allowed to a distributor of information and promoting the use of technology that allows users to select the information they want to receive.

3 Protection from Harmful Content

3.1 Preventing Harmful Content in Japanese Broadcasting

In response to growing concerns about the social effects of the violence shown on television, especially upon young people, MPT plans to study the formulation of a policy on protecting audiences from harmful content in broadcasting. A study group will investigate how other countries are tackling the issue, such as by use of a "V-chip" that controls access to certain programs, and will propose a plan to cope with the challenges that are identified.

3.2 Strengthening the Monitoring of Broadcasting Content

In October 1997, MPT proposed the revision of the Broadcast Law and the Cable Television Broadcast Law in order to strengthen the authority of the Council on Broadcasting Content. Now, for example, broadcasting companies must regularly report to the Council on any complaints they have received regarding the content of programs, and how they have responded to such complaints.

3.3 Study Group on The Effects of Broadcasting on Vision and Hearing

In December 1997, some viewers of a popular children's animation program on television suffered seizures and other physical effects when a brightly flashing light appeared on the screen. As a result of this incident, MPT inaugurated a Study Group on The Effects of Broadcasting on Vision and Hearing, which conducted a thorough investigation into the topic and released a report in June 1998. Its recommendations included the adoption by broadcasting companies of strict guidelines on checking the content of programs for elements that could cause physical problems for viewers and listeners.

5 Achieving the Digital Network Society

1 Responding to Challenges

As has been described in the previous sections, in order to bring into being a society in Japan which makes successful use of digital networks, as well as other forms of info-communications, various challenges need to be met. This section summarizes those challenges and what must be done to overcome them.

1.1 Helping Everyone to Use Network Services

Developing Info-Communications Infrastructure
To achieve the benefits of the new technologies, it is necessary to promote the digitization of subscribers optical networks and broadcasting infrastructure. Therefore, MPT aims to complete a nationwide optical fiber network in Japan by 2010 at the latest, and has been making great efforts to achieve it by 2005. MPT has been also promoting digitization of all broadcasting media by 2000.

Info-Communications in the Public Sector
It is necessary to promote the introduction of various types of applications to the public sector, in areas such as education, medical care and welfare services, as well as by administrative bodies. Local governments are expected to take the initiative in developing the necessary applications, while MPT will take responsibility for supporting the development of advanced applications and other matters to assist the effective use of info-communications in the public sector.

Improvement of Information Literacy
There is a clear need for the level of information literacy in Japan to be improved. Therefore, MPT has decided to take such measures as promoting access to the Internet among schools nationwide.

Making Equipment Easier to Use
If everyone is to enjoy the benefits of info-communications, there must be not only an improvement of information literacy. In addition, computer terminals must become cheaper and easier to use, and equipment must be able to handle a variety of tasks. Therefore, MPT will promote the development and diffusion of user-friendly equipment that can be used flexibly to provide diverse types of service as they appear on the market.

1.2 Improving the Reliability and Security of Network Services

As outlined in Section 4, MPT has been studying ways to ensure the security of network services such as electronic commerce, so that people can be more confident about enjoying the benefits of those networks. Those ways include protection of privacy, taking measures against unauthorized access and compiling rules on distribution of information and complaint procedures.

2 Gaining the Fruits of the Digital Network Society

By making networks easier to use and more secure, a "digital network society" will emerge, in which everyone will have wider opportunities to fulfill their individual potential as well as to contribute fully to the community. This will be achieved by the means outlined in this chapter, and summarized below.

2.1 Expansion of Human Relationships

People in Japan are already using info-communications to expand their social contacts beyond the workplace and to participate more in local communities and volunteer activities. Because it is easier for people to keep in contact with one another by various means, ties among families and friends can become stronger, while contact can be made through cyberspace with people whom one might not otherwise meet. Through new technologies, people can exchange opinions or act together on common interests and causes. In all these ways, digital networks can thus enrich human networks.

2.2 Widening People's Horizons

In some sense, digital networks might be seen as creating a global culture which tends to reduce the importance of individual differences. However, there is no doubt that networks also offer unprecedented access to an enormous range of study and learning, as well as to information that can widen people's horizons in many areas such as hobbies and entertainment. Through these means, people can be enabled to express their personalities and individual creativity, while also taking part in a worldwide society.

2.3 Helping Services to Reach Everyone

With the aging of Japanese society, we can expect greater demand for public services such as medical care and social welfare. At the same time, there will be continuing demand for improved educational and administrative services, regardless of people's ages or residential areas. Digital networks can respond to these demands by giving people access to public services whatever their age or wherever they live, as well as by expanding job opportunities for everyone, including the disabled.

2.4 Expansion of Leisure Time

Info-communications equipment such as cellular telephones can improve workers' efficiency, while digital networks permit people to work from home. Developments like these can contribute to the expansion of leisure time for Japanese workers, and a reduction of the stress and pollution caused by commuting long distances.

Chapter *2*

STATUS OF INFO-COMMUNICATIONS IN JAPAN

1 The Info-Communications Industry in Japan

1 Continued Growth

1.1 Real Domestic Gross Output by Japan's Info-Communications Industry

In the calendar year 1996, the real gross domestic output of the info-communications industry in Japan reached 103.3 trillion yen, representing 11.4% of output by Japanese industry as a whole. The average annual growth rate for the industry from 1993 through 1996 was 6.42%, significantly higher than the 1.68% growth rate of Japanese industry overall **(Fig. 16).**

1.2 Capital Investment

Capital Investment by Japan's info-communications industry declined from fiscal 1992 to 1994. However, in fiscal 1995 investment began to rise again and in fiscal 1996 it broke the 10 trillion yen level for the first time to reach a total of 11.1 trillion yen (up 1.6 trillion yen from the previous year). That figure was 14.5% of the total capital investment by all Japanese industries in fiscal 1996 **(Fig. 17)**.

2 Comparison between the Info-Communications Industries in Japan and the United States

2.1 Contribution of Info-Communications to Nominal Gross Domestic Output

In the calendar year 1996, the nominal gross domestic output of the US info-communications industry was worth 1.2 trillion dollars (then equivalent to 128.0 trillion yen). This was about 1.4 times as large as the figure for the industry in Japan. In the United States, the info-communications industry grew by an average of 7.47% a year between 1993 and 1996, twice the figure for Japan at 3.73%.

2.2 Contribution of Info-Communications to Nominal GDP

Between fiscal 1993 and 1996, the average annual growth rate for the US info-communications industry was 5.73%, compared with 3.55% for the same sector in Japan. In fiscal 1996, the info-communications industry in the United States contributed 0.6 trillion dollars (then equivalent to 66.6 trillion yen) to the country's nominal gross domestic product (GDP). This was about 1.5 times as large as the figure in Japan.

Fig. 16 Real Gross Domestic Output by Japan's Info-Communications Industry
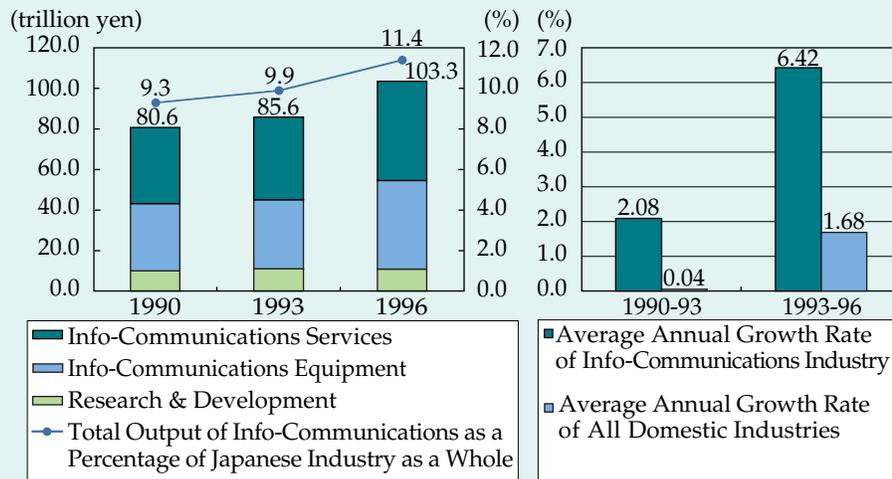
Info-Communications Services
Info-Communications Equipment
Research & Development
Total Output of Info-Communications as a
Percentage of Japanese Industry as a Whole

Average Annual Growth Rate
of Info-Communications Industry

Average Annual Growth Rate
of All Domestic Industries

Sources: Data from MPT, Management and Coordination Agency, Ministry
of International Trade and Indusry, etc.

Fig. 17 Capital Investment by Japan's Info-Communications Industry

Total Capital Investment by Japan's Info-Communications Industry
Share of total investment by:
Info-Communications Industry
Steel Industry
Chemical Industry
Machinery for Transport Industry
Electric Power Companies
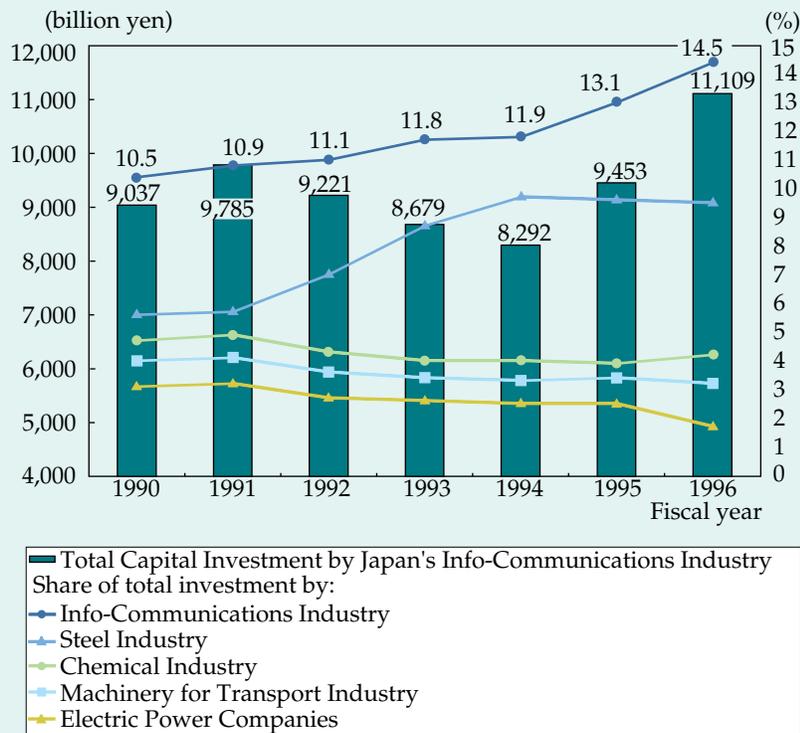
Source: Data from MPT, Management and Coordination Ageney,
Ministry of International Trade and Industry, Ministry of
Finance, Economic Planning Agency, etc.

2.3 Most Productive Sectors of the Info-Communications Industry

Comparing the contribution of the info-communications industry to nominal GDP in Japan and the United States between 1990 and 1996, manufacturing of such items as telecommunications equipment showed the largest share in Japan, while the service sector made the largest contribution in the United States. Regarding average annual growth rates over the same period, almost all sectors of the info-communications industry in the United States showed a higher rate than in Japan, except for telecommunications **(Fig. 18)**.

2.4 Investment in Info-Communications

In Japan, private-sector investment in info-communications reached 14.1% of total private investment in industry in the calendar year 1996, up 7.7 points from 1990, while in the United States it reached 33.8%, up 19.9 points.

2.5 Investment in Info-Communications and Growth of Real GDP

It is clear that investment in info-communications has greatly influenced the growth of real GDP in both Japan and the United States. Private investment in info-communications contributed 15.4% to the rise in Japanese GDP in the calendar year 1996, equivalent to 0.6 points of the rise by 3.9 points from the previous year. Meanwhile, in the United States, such investment accounted for 13% of growth in real GDP in 1996, a substantial increase from the figure of around 3% recorded in the years immediately before.

2.6 Cuts in Telecommunications Charges

In contrast to an average rise in prices of 4.7% in Japanese industry as a whole between 1990 and 1996, the telecommunications sector reduced charges to consumers by an average 16.1%. Over the same period in the United States, telecommunications prices rose by 7.0%, against an average rise of 17.7% for industry as whole.

Fig. 18 Sectoral Growth Rates of the Info-Communications Industry in Japan and the United States between 1990 and 1996
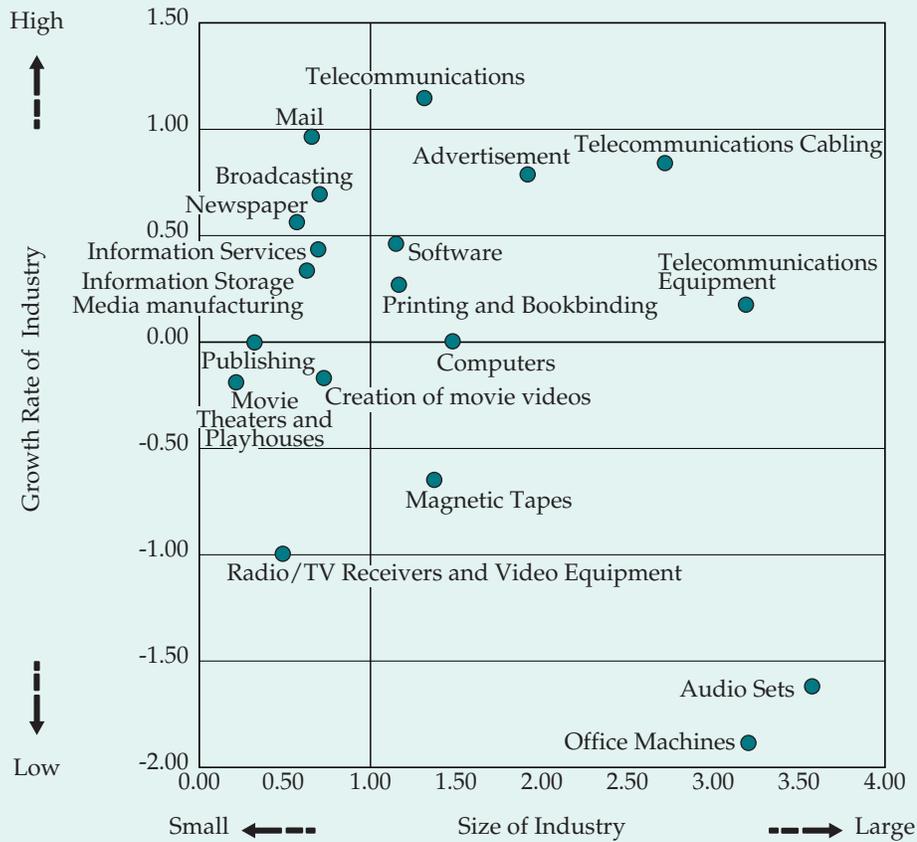
Note: The vertical scale relates the Japanese growth rate to that in the US, with zero indicating no difference.The horizontal scale uses GDP figures in fiscal 1996 to compare industry sizes in Japan and the US, setting the US figure as 1.0.

Sources: Data from MPT, Management and Coordination Agency, Ministry of International Trade and Industry, US Department of Commerce, etc.

2.7 Differences in the Telecommunications Market between Japan and the US

Putting aside the difference in the scale of the economy in the two countries, the main difference in the structure of the Japanese telecommunications market and that of the United States in 1996 was that individual US consumers spent a larger percentage of household income on that sector. There was no significant difference between the two countries in terms of demand from corporate consumers in the business sector. These results suggest that the greatest potential for expansion of the Japanese telecommunications market lies in the household sector **(Fig. 19)**.

3 Ripple Effect of the Info-Communications Industry on Japan's Economy

3.1 Output

Total output by Japan's info-communications industry rose by 22.7 trillion yen between the calendar years 1990 and 1996, reaching 103.3 trillion yen. Additionally, this rise in the info-communications sector created a ripple effect on other industries, resulting in growth in their output of 7.3 trillion yen. Thus, both directly and indirectly, info-communications caused a rise of 30 trillion yen during the period for sales by Japanese industry. This represents 67.3% of the total increase in output of 44.6 trillion yen **(Fig. 20)**.

3.2 Capital Investment

Building Info-Communications Infrastructure
The building of info-communications infrastructure in Japan has led to growth in other industrial sectors. In the calendar year 1996, it created a rise in output for other industries worth 19.4 trillion yen (2.1% of total sales), raised nominal GDP by 8.1 trillion yen (1.6% of total GDP), and created around 727,000 new jobs.

Capital Investment by Type I Telecommunications Carriers
In 1996, Type I telecommunications carriers in Japan invested a total of 4.1 trillion yen in facilities and equipment. This in turn led to increased output in other industries worth 7.4 trillion yen, a rise in nominal GDP of 3.3 trillion yen, and 302,000 more jobs.

Capital Investment by Mobile Telecommunications Carriers
Carriers providing mobile telecommunications services in Japan invested 1.6 trillion yen in facilities and equipment in the calendar year 1996. This induced a rise of 2.9 trillion yen in the output of other industries, a 1.2 trillion yen growth in nominal GDP and an increase of approximately 116,000 jobs.

3.3 Falling Telecommunications Charges

As has been mentioned, between 1990 and 1996, telecommunications charges in Japan fell by an average 16.1%. This induced other sectors to follow suit. The ripple effect is estimated to have accounted for a 0.39% fall in prices charged by industry as a whole, greater than the 0.32% caused by lower charges in the gas and electricity industries and far outstripping the 0.09% contribution of the transport sector.

3.4 Overall Contribution of Info-Communications to Economic Growth

In Japan, info-communications has been making an increasing contribution to general economic growth, as in the United States and other industrialized countries. During the period from 1990 through 1995, Japan's GDP grew by 1.41%. This was in large part due to increasing capital investment in Japan's info-communications industry, which accounted for a 1.85% rise in the total value of the nation's capital.

Fig. 19 Household and Business Demand for Telecommunications in Japan and the US in 1996
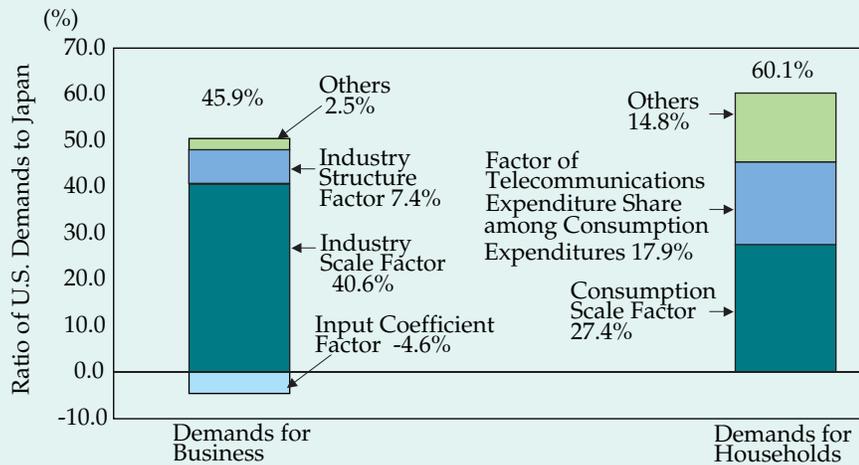
Note: The vertical scale shows Japanese demand as a percentage of US demand for
      telecommunications. Overall, setting demand in Japan as 1, US demand is
      1.46 in the business sector and 1.60 in the household sector.
Sources: Data from MPT, Management and Coordination Agency, Ministry of
         International Trade and Industry, US Department of Commerce, etc.

Fig. 20 The Ripple Effect of Increased Output by the Info-Communications Industry
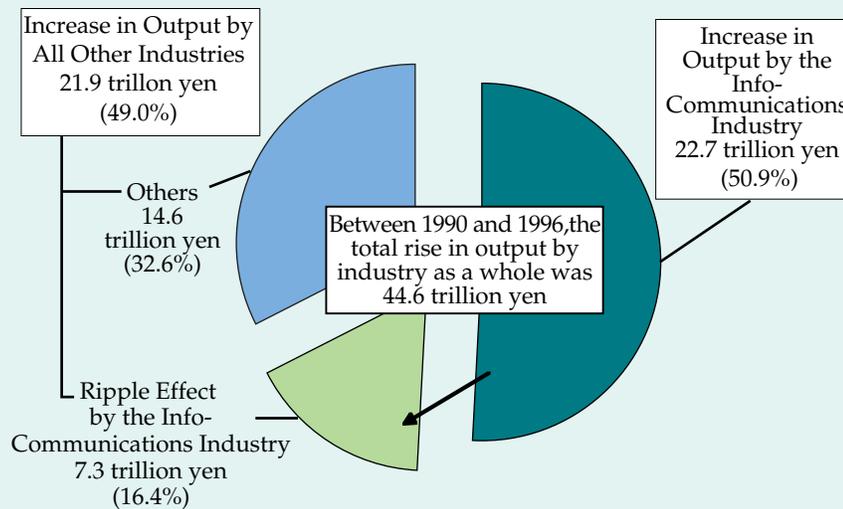
Sources: MPT data; Input-Output Tables, Management and Coordination
         Agency, Updated Nationwide Input-Output Tables, Ministry of
         International Trade and Industry, etc.

2 Trends in Info-Communications Business

1 Number of Operators

Between fiscal 1996 and 1997, there was a significant increase in the number of cable television providers entering Japan's Type I telecommunications business **(Fig. 21)**.

2 Business Performance and Capital Investment of Telecommunications Carriers

2.1 Business Performance

According to the Ministry of Finance's "Annual Financial Statements and Statistics of Corporations by Industry," in fiscal 1996, the total sales of all Japanese industries rose 2.4% from the previous year, with gains of 0.2% in the manufacturing sector and 3.4% in the non-manufacturing sector. An MPT survey found that during the same year, sales by Type I telecommunications carriers amounted to 10,281.1 billion yen (up 16.7% from the previous year), with domestic Type I carriers' sales at 9,814 billion yen (up 16.0%) and international Type I carriers' sales at 467 billion yen (up 35.4%).

2.2 Capital Investment

According to MPT's "Survey of Equipment Investment by the Communications Industry", conducted in March and October 1997, telecommunications carriers invested a total of 4,368.3 billion yen in fiscal 1996, up 24.6% compared with actual investment in fiscal 1995.

In December 1997, the Economic Planning Agency's "Business and Investment Survey of Incorporated Enterprises" gave the following figures for planned capital investment in fiscal 1997: a total of 44,812.7 billion yen for industry as a whole (up 3.0% from the previous year), 15,629.3 billion for the manufacturing sector (up 5.7% from the previous year) and 30,535.7 billion yen (up 1.7% from the previous year) for the non-manufacturing sector. In comparison, the survey showed that the telecommunications sector planned to invest 4,499.5 billion yen, up 3.0% compared with the actual amount in 1996.

3 Business Performance and Capital Investment of Broadcasting Companies

3.1 Business Performance

The general accounts of NHK (Japan Broadcasting Corporation) reveal that in fiscal 1996 the public broadcasting company's operating revenues stood at 587.6 billion yen (up 2.8% from the previous year). Of those revenues, 571.4 billion yen came from NHK's receipts from viewers' subscription fees (up 5.0% from the previous year). Operating expenses amounted to 585.3 billion yen (up 2.9% from the previous year), giving a positive balance for the year of 2.2 billion yen.

Meanwhile, the fiscal 1996 balance sheets of commercial broadcasting companies in Japan also showed positive figures. A significant increase in profit over the previous year was recorded by 193 of the terrestrial broadcasting companies and by 58 companies using either broadcasting or communications satellites, which posted total profits of 2,558.1 billion yen (up 8.5% from the previous year). Satellite broadcasters in particular recorded a remarkable rise in total profits of 16.8% from the previous year, following the inauguration of digital broadcasting via communications satellite.

In fiscal 1996, Japan's commercial operators of cable television showed total operating profits of 213.0 billion yen (up 89.3% from the previous year) for programming produced in-house and operating expenses of 219.5 billion yen (up 83.7% from the previous year). In addition, the companies' total recurring losses were reduced to 10.6 billion yen (down 15.9% from the year before).

3.2 Capital Investment

According to the MPT's Survey of Equipment Investment by the Communications Industry, conducted in March and October 1997, broadcasting companies as a whole invested 550.8 billion yen in facilities in fiscal 1996, up 78.3% from the previous year. However, planned capital investment for fiscal 1997 stood at 292.5 billion yen, down 46.9% over the actual investment amount in fiscal 1996.

4 Business Performance of Postal Services

4.1 Number of Post Offices

Post offices are located in every city, town and village in Japan. At the end of fiscal 1997, the total number of post offices was 24,693 (up 0.2% from the previous year). These comprised 1,324 ordinary post offices (up 3 from the previous year), 18,764 special post offices (up 53), and 4,605 postal agencies (down 1).

4.2 Business Performance of Postal Services

Revenues of Japan's postal services in fiscal 1996 rose 2.2% from the previous year to 2,336.2 billion yen, while operating expenses rose 3.6% to 2,241.9 billion yen, largely due to the implementation of a new postal code system. As a result, the postal services showed a profit of 94.3 billion yen in fiscal 1996, down 22.6% from the previous year.

Fig. 21 Type I Telecommunications Carriers

Categories	Number of carriers		
	Fiscal 1996	Fiscal 1997	Change
■ Telecommunications carriers			
• Type I			
NTT	1	1	0
KDD	1	1	0
NTT DoCoMo Companies	9	9	0
New carriers			
Long-distance / international carriers	5	6	1
Regional carriers	28	47	19
Satellite systems operators	4	5	1
Cellular and pocket-pager operators	90	84	-6
Total	138	153	15
• Type II			
Special (of which international carriers)	78(56)	95(67)	17(11)
General	4,510	5,776	1,266
Total	4,588	5,871	1,283
Total	4,726	6,024	1,298
■ Broadcasters			
• Terrestrial broadcasting			
NHK	1	1	0
University of the Air Foundation	1	1	0
Commercial broadcasters	266	290	24
Total	268	292	24
• Satellite broadcasting (excluding NHK)			
BS broadcasters	2	2	0
CS broadcasters			
Program supplying broadcasters			
Television	56	71	15
Sound (only)	4	5	1
Data (only)	—	1	1
Facility supplying broadcasters	2	2	0
Total	64	81	17
Total	332	373	41
■ Cable TV operators	708	729	21
■ Postal services	1	1	0

Source: MPT data

4.3 Implementation of a New Postal Code System

In February 1998, MPT inaugurated a new postal code system for all addresses in Japan. The code has seven digits and includes information that previously could not be read by automatic sorting machines. Use of the codes is expected to greatly improve the efficiency of mail services nationally.

The cost of installing some 1,500 new sorting machines for the code system is expected to reach 220.0 billion yen over ten years. However, this additional investment is likely to be recovered through greater efficiency. In the report issued by the Postal Service Council in August 1995, it was estimated that the new postal code and mail sorting system would cut costs overall by 200.0 billion yen or more, and require 8,000 fewer staff.

3 Trends in Info-Communications Services (Figs. 22 and 23)

This section covers both domestic and international info-communications services provided by companies in Japan.

1 Trends in Telecommunications Services

1.1 Telephone Services

Standard Telephone Services
As of the end of September 1997, Nippon Telegraph and Telephone Corporation (NTT) held 61.24 million telephone service contracts, down 0.5% from the previous year, representing the first decline since World War II. Three new long-distance Type I telecommunications carriers held a total of 36.8 million subscriptions (in terms of the number of ID registrations), up 8.2% over the previous year.

International Telephone Services
The total number of minutes of outgoing and incoming international calls during fiscal 1996 amounted to 3.23 billion, up 9.4% from the previous year. As in the previous year, in fiscal 1996, at 32.5% the United States accounted for the biggest share of time spent on incoming and outgoing calls from Japan, a figure that had risen by 2.5% from fiscal 1995. China and the ASEAN countries occupied the next largest shares, virtually unchanged from the previous year.

New Telephone Services
As of January 1998, seven companies provided domestic public-leased-public connections, in which leased circuits are connected to the public telecommunications network at both ends.

In April 1997, Internet telephone services were inaugurated, allowing calls to be made from a personal computer to a conventional telephone, as well as between telephones via the Internet. In August 1997, international Internet telephone services were also recognized.

Titus Communications Inc. began to operate a telephone service via cable used for television services in Kashiwa, Chiba Prefecture, in June 1997, while Suginami Cable TV Inc. began a similar service in the following month in the Suginami ward of Tokyo. Telephone relay services linked to NTT's local exchanges were started by TTNet in January 1998. As of December 1997, call-back services were provided by 88 companies in Japan, including AT&T.

Fiscal 1997 also saw the inception of a service to identify callers by displaying their telephone numbers on receivers' telephones. In January 1997, NTT began pilot operation of the service in the cities of Yokohama, Nagoya and Fukuoka. Nationwide operation of the caller identification service began in February 1998.

Fig. 22 Trends in Domestic Info-Communications

Index (End of fiscal 1986=100)

Legend:
- Telephone subscriptions
- Cellular telephone subscriptions
- Radio paging subscriptions
- ISDN circuits
- High-speed digital circuits
- Telegrams (thousands)
- NHK subscriptions
- NHK satellite broadcasting subscriptions
- Cable TV subscriptions
- Wireless-communication terminals
- Domestic mail volume (thousands)

Fiscal year (year end)

	Actual numbers	
Telephone subscriptions	46,771,699 (fiscal 1986) →	61,244,213 (September 1997)
Cellular telephone subscriptions	95,131 (fiscal 1986) →	26,084,975 (September 1997)
Radio paging subscriptions	2,487,946 (fiscal 1986) →	8,982,024 (September 1997)
ISDN circuits	1,198 (fiscal 1986) →	1,701,044 (September 1997)
High-speed digital circuits	2,225 (fiscal 1986) →	163,477 (September 1997)
Telegrams (thousands)	40,050 (fiscal 1986) →	40,198 (fiscal 1996)
NHK subscriptions	31,954,635 (fiscal 1986) →	35,816,023 (fiscal 1996)
NHK satellite broadcasting subscriptions	1,207,000 (fiscal 1986) →	8,591,000 (fiscal 1997)
Cable TV subscriptions	437,344 (fiscal 1986) →	5,000,579 (fiscal 1996)
Wireless-communication terminals	4,155,554 (fiscal 1986) →	29,211,483 (fiscal 1996)
Domestic mail volume (thousands)	18,033,930 (fiscal 1986) →	25,632,511 (fiscal 1997)

Source: MPT data

Notes:
1: The index for ISDN circuits and cable TV subscriptions is based on a value of 100 at the end of fiscal 1988; the index for NHK satellite broadcasting is based on 100 in fiscal 1989.
2: The number of ISDN circuits is the number of basic interface circuits.
3: Figures for cable TV refer to independently broadcast programming.

Fig. 23 Trends in International Info-Communications

Index (End of fiscal 1986 = 100)

Fiscal year (year end)
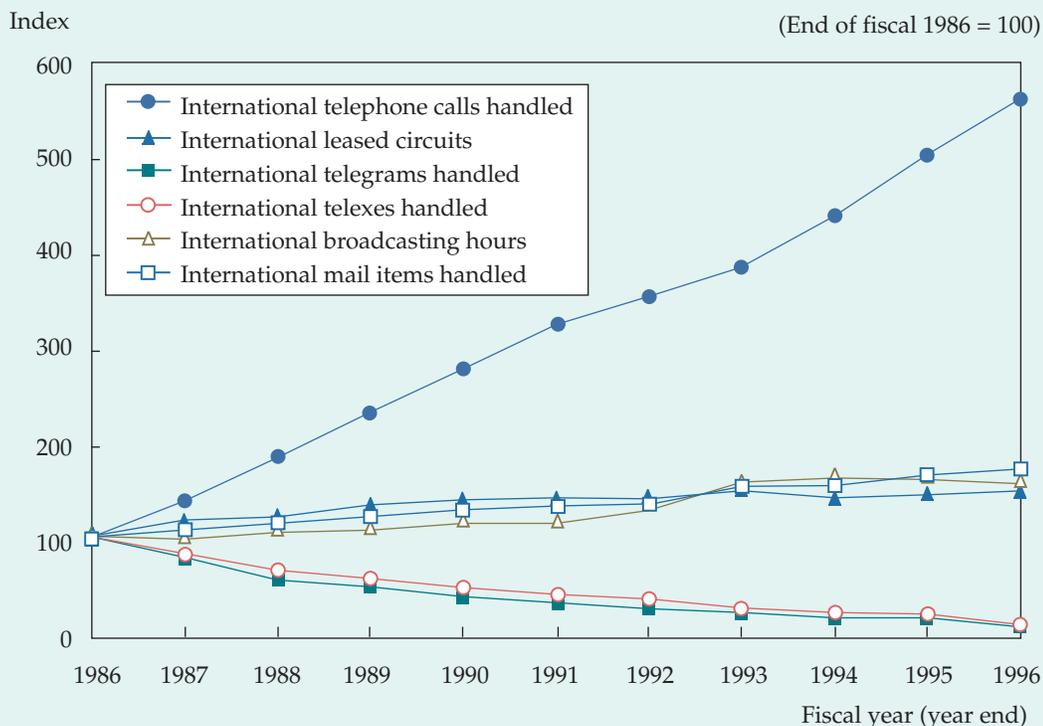
Actual numbers

International telephone calls handled (millions)	131.4 (fiscal 1986) →	763.2 (fiscal 1996)
International leased circuits	1,149 (fiscal 1986) →	1,771 (fiscal 1996)
International telexes handled (thousands)	43,790 (fiscal 1986) →	4,980 (fiscal 1996)
International telegrams handled (thousands)	1,200 (fiscal 1986) →	170 (fiscal 1996)
International broadcasting hours	40 (fiscal 1986) →	65 (fiscal 1996)
International mail items handled (millions)	242.5 (fiscal 1986) →	430.0 (fiscal 1996)

| Fiscal year (year end)	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
International telephone calls handled	100.0	140.4	188.6	238.3	285.3	332.1	359.0	392.6	447.0	510.9	569.1
International leased circuits	100.0	119.7	127.2	135.2	142.0	144.8	144.0	145.9	143.1	147.2	154.1
International telexes handled	100.0	79.3	60.7	48.7	39.3	32.5	25.4	20.5	16.1	13.3	11.4
International telegrams handled	100.0	80.8	66.7	58.3	50.8	45.8	37.5	27.5	22.5	18.1	14.2
International broadcasting hours	100.0	100.0	107.5	107.5	117.5	120.0	131.3	150.0	162.5	162.5	162.5
International mail items handled	100.0	106.3	113.7	120.2	127.2	135.1	138.0	145.0	150.9	166.6	177.3

Source: MPT data

1.2 Mobile Communications

Cellular telephone services are offered by 21 firms in Japan, including regional NTT DoCoMo companies and new providers. At the end of September 1997, these 21 companies held a total of 26.08 million subscriptions for cellular telephone services. By the end of fiscal 1997, the figure had reached 31.53 million, a 70.4% increase from the previous year **(Fig. 24)**.

Fig. 24 Growth in Subscriptions to Cellular Telephone Services

Subscriptions
(million)

Growth rate
(%)

- New Common Carriers (NCCs)
- NTT DoCoMo Companies (NTT prior to fiscal 1991)
- Growth rate of cellular telephones

Fiscal year (year end)
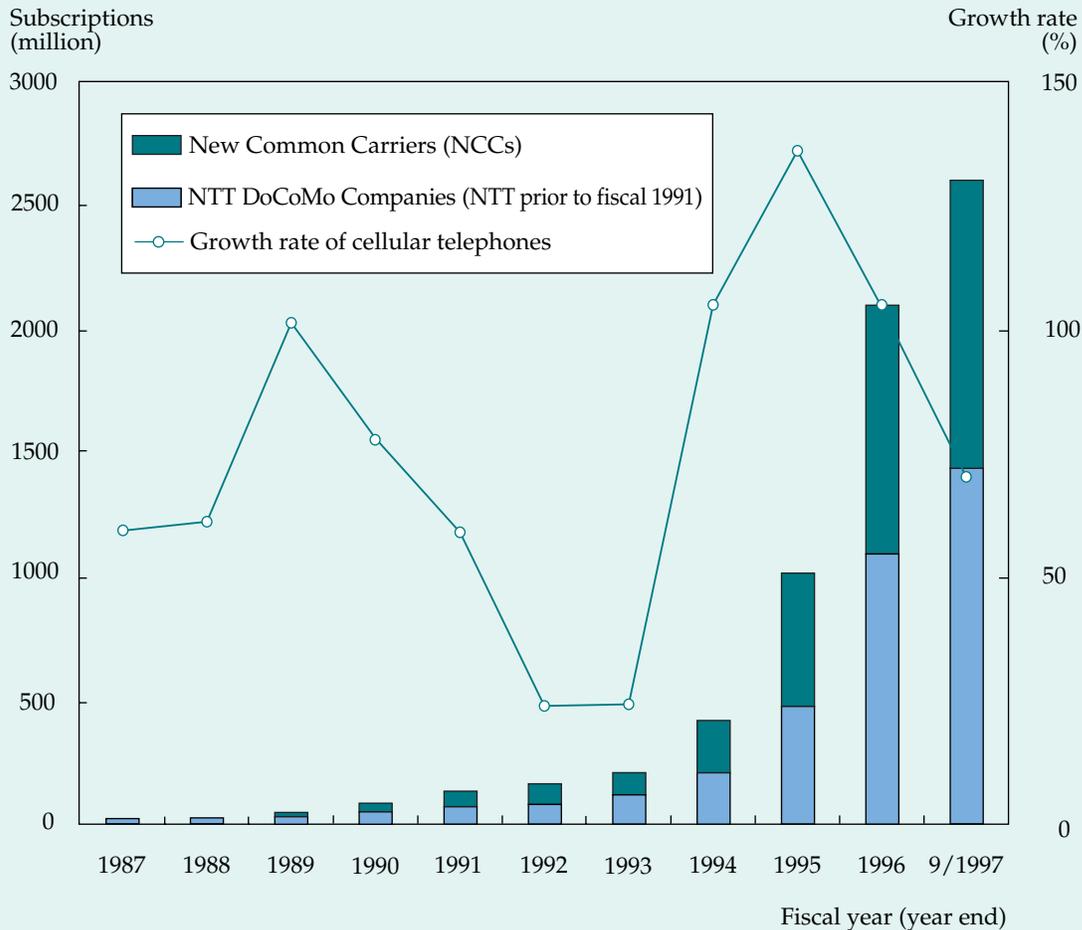
Source : Data from new common carriers, NTT and NTT DoCoMo Companies.

Actual figures

Fiscal year (year end)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	9/1997
NTT DoCoMo Companies (NTT prior to fiscal 1991)	15.1	23.9	37.8	54.9	84.6	102.7	132.2	220.6	493.6	1,096	1,441
New Common Carriers (NCCs)	−	0.4	11.1	31.9	53.2	68.5	80.9	212.5	526.8	992	1,168
Growth rate of celluar telephones	58.9	60.9	101.2	77.5	58.8	24.2	24.5	103.2	135.6	104.6	70.4

Meanwhile, the number of PHS service contracts surged to 7.07 million at the end of September 1997, up 78.4% from the previous year. However, during the latter half of the fiscal year the growth rate slowed and the total number of contracts at the end of fiscal 1997 was 6.73 million, down 4.8% from six months previously.

Radio-paging services are provided by the NTT DoCoMo companies and 31 other companies in Japan. At the end of September 1997, all these companies had a total of 8.98 million subscribers to radio-paging services, representing a fall of 15.5% from the previous year. This downward trend continued and at the end of fiscal 1997, the total number of subscribers was 7.12 million.

1.3 Services via Leased Circuits

Domestic Leased Services
High-speed digital transmission services are offered via leased circuits by NTT and 16 other companies, including both long-distance and regional carriers. By the end of September 1997, a total of 163,477 leased circuits were in use, up 67.7% from a year before. The number of circuits leased by non-NTT carriers rose by 32.3% to 23,112, representing a 14.1% share of all leased circuits, down 3.8 points from the previous year.

International Leased Services
At the end of fiscal 1996, the total number of leased circuits provided by Kokusai Denshin Denwa Co., Ltd. (KDD), International Telecom Japan Inc. (ITJ), and International Digital Communications Inc. (IDC) amounted to 1,771, up 4.7% from the previous year.

1.4 ISDN Services

Domestic ISDN Services
Use of Integrated Services Digital Network (ISDN) services rose dramatically in fiscal 1997. At the end of September 1997, there were 1,701,044 basic interface circuits in use in Japan, up 128.6% from a year before, and 27,997 primary rate interface circuits, up 102.9%. These substantial increases were due to greater household use of ISDN services with the growing use of the Internet and communications by personal computer.

International ISDN Services
Three international carriers provide international ISDN services in Japan. At the end of fiscal 1996, the total number of contracted circuits was 10,647, mostly used by businesses for international communications such as a video conferencing.

1.5 Internet Services

Internet Connections Worldwide
According to the US computer and communications company, Network Wizards, as of January 1998 there were almost 29.67 million host computers connected to the Internet worldwide, up 83.8% from a year before. Of these, about 1.17 million were in Japan **(Fig. 25)**.

Internet Services and Connections in Japan
There is increasing use of the Internet in Japan, as shown by the fact that the number of access points for Internet dial-up IP connections had reached about 4,600 nationwide at the end of January 1998. At the end of February 1998, Internet services were provided by 2,561 Type II telecommunications carriers in Japan, or about 40% of all such carriers. In addition, 15 Type I telecommunications carriers in Japan provided the same services.

Internet Services and Connections Worldwide
According to Network Wizards, as of January 1998, the United States had the largest number of host computers connected to the Internet: about 20.62 million, or 69.5% of the world total. Japan was next with about 1.17 million host computers linked to the Internet, or 3.9% of the world total, followed by Germany with 3.4%, or 1 million computers, the United Kingdom with 3.3% or 990,000 computers, and Canada with 840,000 computers, or 2.8% of the world total.

2 Trends in Broadcasting Services

2.1 Rising Number of Subscribers in Japan

At the end of December 1997, NHK had a total of 36,209,000 subscribers to all its broadcasting services. Of these, the number of general subscriptions excluding satellite broadcasting was about 27,586,000, down 0.6% from a year before. Meanwhile, the number of subscribers to NHK's services via broadcasting satellite (BS) rose 8.2% to reach about 8,623,000. Similar growth was seen in the 8.8% rise in subscriptions to BS services provided by Satellite Digital Audio Broadcasting

Fig. 25 Growth in Host Computers Connected to the Internet

Number of Host Computers
(thousand)
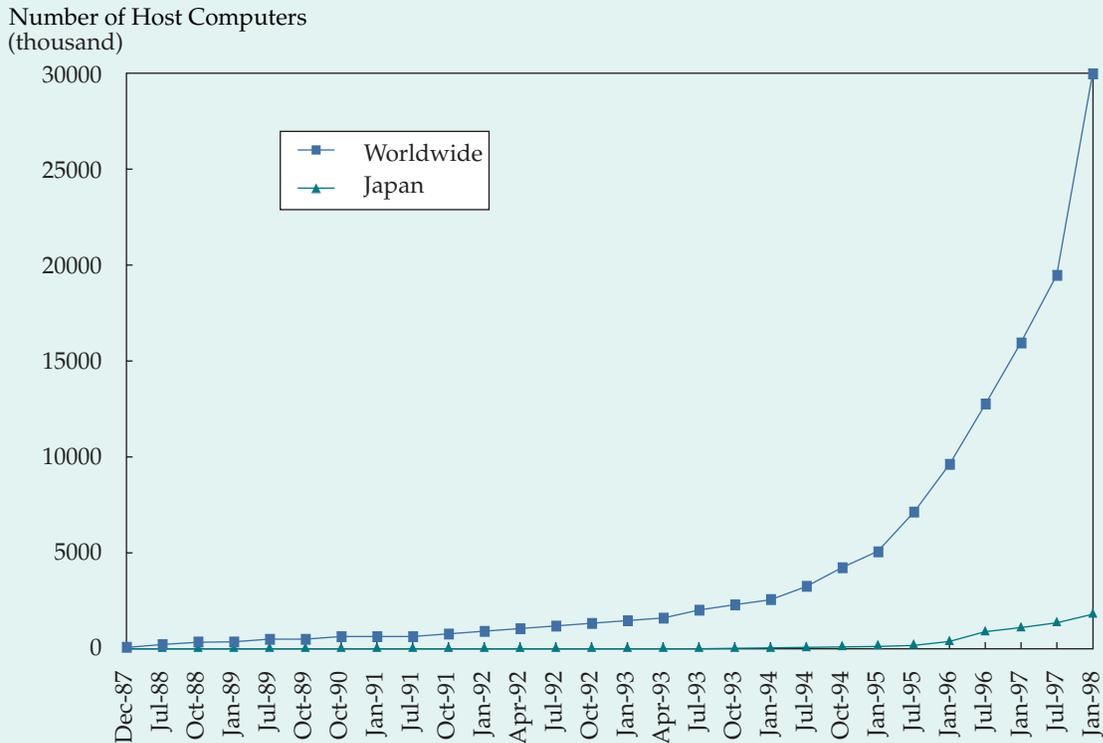
Source: Network Wizards

Co., Ltd. (SDAB), which by the end of December 1997 had about 123,000 subscribers, and the 5% rise in subscriptions held by Japan Satellite Broadcasting, Inc. (JSB) to reach about 2,362,000.

There was a dramatic increase in subscriptions to television broadcasting via communications satellites (CS) since the start of such services in Japan in August 1996. The total number of subscriptions reached about 5,330,000 at the end of December 1997, up 243.9% from a year earlier.

There has also been strong growth in cable television services. At the end of fiscal 1996, cable TV providers offering their own programs had some 5 million subscribers, up 37.5% from the previous year. Cable television now reaches over 10% of households in Japan.

2.2 Commercial Terrestrial Broadcasting

Commercial Terrestrial Television Broadcasting
Two new privately owned local television stations began broadcasting in April 1997 in Yamagata Prefecture and in Kochi Prefecture. In addition, in March 1997 the first local private television station to offer services in Tochigi Prefecture obtained permission to start building facilities.

Commercial FM Radio Broadcasting
In April 1997, the second private FM radio station to operate in Fukuoka Prefecture began broadcasting. Throughout that year, 25 new stations began broadcasting to particular communities within a prefecture, bringing the national total to 89. Also, eight such stations obtained permits to construct facilities and four stations were preparing to start operations.

Foreign Language Broadcasting
In fiscal 1997, a regional private FM radio station

was established in Fukuoka City to offer broadcasts to the area in English and other languages. It was the third station of its type in Japan, following ones in Osaka and Tokyo.

TV Text Broadcasting

At the start of fiscal 1998, NHK was providing a nationwide service on its terrestrial channels to provide text on screen during broadcasts, mainly with the aim of providing news flashes, weather reports and traffic information. In addition, 33 commercial terrestrial broadcasters provided similar services in their operational areas.

Terrestrial TV Data Multiplex Broadcasting

Meanwhile, in October 1996, television data multiplex broadcasting was expanded to allow viewers to receive related text and other information on screen with normal television broadcasts. It also lets them interact with broadcasters via telephone lines in order to shop, take part in quiz programs, and so on. The service uses the Vertical Blanking Interval (VBI) format to make use of surplus band width. In May 1997, a similar service providing news, sports and financial information was started for users of personal computers which can receive television broadcasts.

Ultra-Short Wave FM Radio Multiplex Broadcasting

Ultra-short wave FM radio multiplex broadcasting started in October 1994. By January 1998, NHK and 39 commercial broadcasters provided news, traffic information and so on through the new service.

2.3 Satellite Broadcasting

Via Broadcasting Satellites (BS)

At the end of fiscal 1997, NHK had two BS channels and JSB had one channel offering a complete program of broadcasts. In addition, a fourth channel is operated jointly by NHK and private broadcasting companies to give a pilot service in the Hi-Vision format.

Via Communications Satellites (CS)

CS digital broadcasting started in Japan in June 1996, and fee-based broadcasting began the following October. Using the satellite JCSAT-3, a total of 103 channels were provided by 61 broadcasting companies. In addition, one company provided on-screen data broadcasting on 21

channels, while ultra-short wave broadcasting of a total of 107 channels was provided by seven companies, four of which also provided standard broadcasting.

As for broadcasting using the satellite JCSAT-4, a total of 68 channels were provided by 50 broadcasting companies. In addition, one company provided ultra-shortwave broadcasting on 29 channels, while two companies received a license for data broadcasting on 17 channels, both of which also provided standard broadcasitng.

As for broadcasting using the Superbird C satellite, standard format broadcasts were provided on a total of 90 channels by 18 companies, while one company offered ultra-shortwave broadcasting on 29 channels. Additionally, one company received a license for data broadcasting on 16 channels.

2.4 Cable Television

Growth in Facilities

At the end of fiscal 1996, companies offering their own television programs via cable had a total of 937 broadcasting facilities in Japan, up 12.9% from the previous year.

New Services

The trend towards adding value to cable TV services continued through fiscal 1997 with the inauguration of new, two-way services. Five companies began an Internet connection service, two firms started a standard telephone service and two began offering a home security service. In fiscal 1998, a cable TV provider is expected to start a digital broadcasting service.

2.5 International Broadcasting from Japan

International broadcasting from Japan is currently provided by NHK through a television service and through Radio Japan with shortwave radio programs. As well as being transmitted directly from KDD's Yamata station in Ibaraki Prefecture, Radio Japan is also broadcast indirectly through relay stations at various overseas locations.

In fiscal 1997, Radio Japan broadcast worldwide a total of 31 hours of programs in Japanese or English each day. In addition, broadcasts in 34 other languages to relevant areas of the world came to a total of 65 hours per day.

The main target areas for international television broadcasting were North America, which received broadcasts for about 5 hours 30 minutes a day, and Europe which received about 4 hours and 40 minutes of programs each day. Programs were also distributed to other areas, such as the Asia-Pacific region, South and Central America and Eastern Europe. From fiscal 1998, international television broadcasting from Japan is planned to reach almost every part of the world.

3 Trends in Postal Services

3.1 Volume of Mail

The amount of domestic mail handled in Japan in fiscal 1997 was 25.6 billion items, up 1.1% from the previous year. The volume of international mail was 439.94 million items, up 2.3%.

3.2 Usage Patterns of Postal Services

Every three years, MPT publishes a "Survey of Structures of the Mail Service." According to the September 1997 edition of the survey, private individuals accounted for 23.4% of all senders of mail in Japan, while businesses comprised 76.6%. As for recipients of mail, 73.2% were individuals and 26.8% were businesses. These relative proportions have been maintained at a similar level since 1976; however, the 1997 survey showed an increase in the number of individuals sending mail in Japan.

Five types of message or information accounted for 85% of all mail sent in Japan, according to the survey. The biggest share was taken by advertising and marketing at 26.3% of total mail sent, overtaking the 23.5% of financial transactions, which had topped the previous survey. This was followed by invitations to events or meetings at 12.0% of total mail, personal news and greetings at 11.6% and other business communications, also with 11.6%.

3.3 Regional Mail Traffic in Japan

MPT's "Survey of Postal Traffic by Destinations," issued in June 1997, showed that the amount of mail sent locally within the sender's prefecture (50.8% of total domestic mail) was almost the same as the volume of mail delivered to other prefectures in Japan (49.2%). This was a significant change from the previous survey, issued in June 1994, when the amount of local mail was about 50% larger than the amount of long-distance mail. Among Japan's 47 prefectures, those with the greatest amount of mail sent within their boundaries were Okinawa and Hokkaido.

4 Telecommunications Charges

1 Domestic Charges

According to the Bank of Japan, in the last quarter of 1997 the Corporate Service Price Index (CSPI) in Japan rose to 103.4 compared with the 1990 base value of 100, while the index of prices for domestic telecommunications services fell 13.4 points to 86.6. There was an especially dramatic fall to 40.8 in the price index for cellular telephone services **(Fig. 26)**.

During fiscal 1997, charges for cellular telephone services were lowered substantially. In the Kanto region surrounding and including Tokyo, a telephone service via the cable television system was introduced and TTNet started a relaying telephone service. This cut charges in the area to less than 10 yen for a three-minute weekday day-time call for the first time since the liberalization of Japanese telecommunications began in 1985.

2 International Charges

As shown in Fig. 27, in the October-December quarter of 1997 the Corporate Service Price Index for all forms of international telecommunications stood at 81.2, down 18.8 points from the 1990 base value. The index for international telephone charges was particularly low at 78.9 **(Fig. 27)**.

The fall in charges can be attributed to the cutting during fiscal 1997 of subscriber port charges for international frame relay services, as well as reductions in other international telecommunications charges such as those imposed by Internet gateway services.

5 Radio Wave Usage

Rise in Wireless Communications Terminals for Mobile Phone Services

At the end of fiscal 1996, there were 29.21 million terminals in Japan for wireless communications, up 68.7% from the previous year. The main reason for this increase was the tremendous rise in the number of cellular telephones, which grew by 104.6%. Of all the terminals, 93.3% were used as radio stations for mobile communications, including 71.5% used specifically for cellular telephone services.

Some terminals fulfilled other purposes, with 4.4% used as amateur radio stations, 1.3% as personal radio stations, and 0.9% as either fixed stations, broadcast stations, test stations or radar stations.

Radio Operators in Wireless Communications

In Japan, 23 qualifications are recognized for employment in the fields of general, maritime, aeronautical, land and amateur radio. The total number of radio operators holding one of these qualifications was 5,073,577 at the end of fiscal 1997.

Fig. 26 Corporate Service Price Index (Domestic Telecommunications Services)
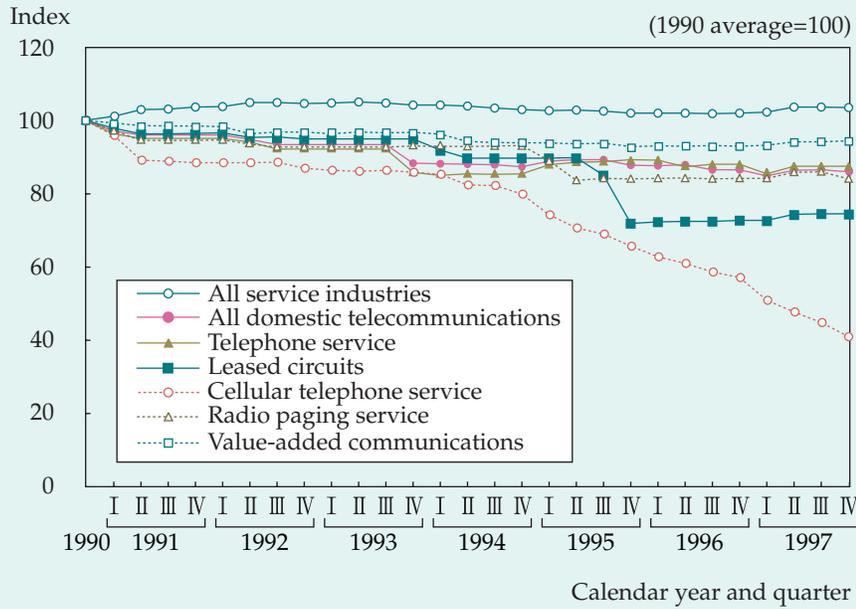
Index
(1990 average=100)

Calendar year and quarter

Source: Price Indexes Monthly, Bank of Japan
Note: The Roman numerals refer to the quarter of the calendar year.
        "Value-added communications" refer to pocket switching,
        circuit resales, e-mails, and facsimile communications

Fig. 27 Corporate Service Price Index (International Telecommunications Services)
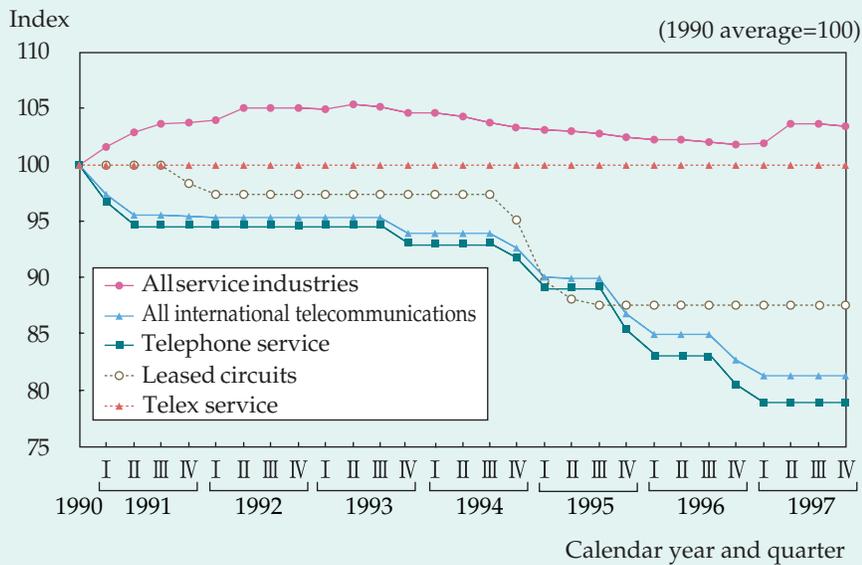
Index
(1990 average=100)

Calendar year and quarter

Source: Price Indexes Monthly, Bank of Japan
Note: The Roman numerals refer to the quarter of the calendar year

6 Census of Information Flow

1 Information Flow in Japan

1.1 Trends in Information Flow

In fiscal 1996, MPT compiled indices of changes in the national flow of information over the previous decade, using levels of fiscal 1986 as a base. The indices covered an estimate of the total amount of communications achieved through letters, telephone calls, books, newspapers and magazines, television and radio broadcasts and computer communications in Japan during a fiscal year. The amount of information in each of these media was compared using a set of conversion ratios.

The results show that the amount of all types of information distributed rose significantly over the ten-year period, by an average of about 9%. This exceeded the 3.1% average growth rate of real GDP over the same period. The rise in information flow is attributable to the rapid increase in personal media using telecommunications, as well as growing use of the Internet and media with large data transmission capacity.

1.2 Growing Information Flow in Various Types of Media

Among the media showing the highest growth rates in information flow between 1986 and 1996 were rental videos (which saw information handled rise by a factor of 30.7), cable television (10.6), personal computer software (7.4) and video software (6.0). Extremely high rates of growth were seen in television via broadcasting satellite, which recorded a growth factor of 329.4, according to the calculation methods adopted in the study.

2 Regional Trends

A regional breakdown of the volume of information transmitted during fiscal 1996 reveals that metropolitan Tokyo accounted for 20.4% of the total, with Osaka in second place at 7.3%. Kanagawa Prefecture was next with 5.9%, the Aichi Prefecture with 5.1% and Saitama Prefecture with 4.6%. These seven areas accounted for more than half the total volume of information distributed in Japan.

7 Info-Communications and the Reform of Japan's Socio-Economic Structure

1 Info-Communications in Industry

1.1 Electronic Commerce

Market Scale
According to MPT data, in Japan in fiscal 1996 total sales of goods and services ordered through the Internet by electronic commerce amounted to 28.5 billion yen, but this figure grew almost threefold to reach 81.8 billion yen in fiscal 1997 **(Fig. 29)**. MPT's Study Group on the Internet Business has estimated that in 2005, electronic commerce in Japan will be worth 1.1 trillion yen. Meanwhile, the number of companies engaged in this sector in Japan rose sharply to 6,560 as of February 1998, up 94.8% since the end of fiscal 1996.

Business Performance
According to MPT data, almost half (45.9%) of the companies engaged in electronic commerce achieved higher sales in fiscal 1997 than in the previous year, and 17.2% doubled their sales.   In contrast, only 8.6% of the businesses reported a reduction in sales.

The companies which increased their sales in fiscal 1997 were notable for their efforts to respond to clients' needs. The MPT survey showed that these companies were more likely than average to introduce new products on a trial basis, to set lower prices than competitors and to give customers

various ways to pay for goods. Additionally, these companies frequently used the Internet to solicit consumers' opinions.

Merchandise and Services

Among the merchandise and services offered through electronic commerce in fiscal 1997, computer software accounted for the largest total sales of 25.3 billion yen. This was followed by on-

line ticket reservation services at 8.6 billion yen and sales of food items at 7.8 billion yen **(Fig. 28)**. There was no significant change overall in the types of item sold through electronic commerce to customers in Japan, but a larger share was occupied by goods associated with the arts and music, and the share taken by hotel and transport reservations also increased.

Fig. 28 Market Scale of Electronic Commerce in Japan

Fiscal 1996

Fiscal 1997

28.5 billion yen

81.8 billion yen

Others
24%
18.3 billion yen

Furniture
/Home
Electronics
/Household
Utensils
4%
3.5 billion yen

Garments
7%
5.8 billion yen

Books
/Magazines
/Stationery
9%
7.5 billion yen

Foods
10%
7.8 billion yen

Computer
Equipment
/Computer
Software
31%
25.3 billion yen

Information
Providing
Service 4%
3.4 billion yen

Reservation
Service
11%
8.6 billion yen

Source: MPT data; Fiscal 1997 figures are values at the time of the survey, January 1998.

The surveys comprise data on electronic commerce provided to ordinary consumers over the Internet; they exclude transactions in intermediate goods between businesses.

Customer Profile

MPT data show that among companies engaged in electronic commerce, 14.7% reported a rise in the number of female clients in fiscal 1997, while 4.1% said they had a larger number of clients aged 60 or more. These figures suggest that electronic commerce is gradually reaching a wider range of customers.

Paying for Goods and Services

The most common methods used by customers to pay for goods and services bought through electronic commerce was by charging purchases to a credit card, which accounted for 51.1% of transactions. However, the companies themselves mostly settled their accounts by cash transfers through banks, by postal money order and through the payment-on-delivery system. It is apparent that there is scope for greater use of credit card settlements by companies.

Promotion of Electronic Commerce

According to the MPT survey, businesses identified a number of factors that would help to promote electronic commerce in Japan. Among those factors, the highest priority was given to improving consumers' skills in operating computers and accessing the Internet (27.0% of respondents), reduction of telecommunications charges (20.1%), and developing more reliable on-line payment systems (10.3%). Consumers also gave high priority to security of payment systems, but also identified the need to protect the privacy of users, an item which the companies considered less important.

Companies engaged in electronic commerce also described ways in which they wanted the Japanese government to help promote the sector. The most important methods were identified as promoting the reduction of network service charges (named by 57.6% of respondents) and development of new payment systems such as electronic money, (51.9% of respondents).

1.2 Growth in Related Goods and Services

The growth of the Internet has not only boosted electronic commerce in Japan. It has also helped to expand related markets for equipment and connection services. According to the report of MPT's Study Group on the Internet Business, the scale of related business reached 2.7 trillion yen in fiscal 1997, of which 544 billion yen represented equipment sales, while connection services accounted for 2,125.7 billion yen.

2 Info-Communications and Local Government

2.1 On-line Information Systems in Municipalities

Meeting the Needs of Citizens in Areas of Special Risk

At the start of fiscal 1997, a total of 1,231 municipalities in Japan had been officially designated as depopulated. In addition, 1,195 were located in relatively inaccessible mountain areas, 962 in areas prone to heavy snowfall and 184 on isolated islands. In all those municipalities, network applications were used to give residents information in emergencies, as well as normal administrative information.

According to an MPT survey, citizens of these communities expressed a strong desire for local governments to provide more information services on-line. In particular, they wanted to be able to have remote access to general administrative information and procedures, as well as information on and support systems for public health, medical treatment services and welfare. In addition, respondents wanted access to on-line methods for reporting emergencies.

Local governments in the municipalities also gave priority to these uses of on-line information systems. In addition, they said such services were important because they helped to overcome the problems of depopulation, including scattered and aging communities with growing numbers of elderly people living alone, as well as insufficient access to administrative and medical services because of poor transport facilities.

Overcoming Difficult Conditions

The MPT survey showed that both citizens and local governments in areas of Japan that experience difficult conditions have clearly recognized the value of on-line information systems in helping them overcome problems. In particular, support was indicated for MPT's projects to close the gaps in access to telecommunications in Japan and to promote the use of information networks by local governments. The Ministry of Agriculture also supported the project to establish communications centers in rural communities.

The effective use of such schemes of assistance from Japan's central government and prefectural governments can contribute greatly to establishing the on-line information systems that are needed in areas subject to special risks. Achieving that aim also requires the strong support of municipal governments and residents. Because of the limited finance available to municipalities, it is also important for two or more to cooperate by pooling their resources to extend the areas covered by information systems.

2.2 Use of Computers and Networks by Prefectural Governments

In 1997, MPT surveyed Japan's 47 prefectures to discover how much they used computers and computer networks within their administrations, as well as to give information to citizens. The survey also examined the prefectures' budgets for promoting these systems.

Computers in Administration

Taking as an example the procedures for receiving a variety of taxes, the MPT survey revealed that 33 prefectures had computerized almost all procedures while a further eight prefectures had computerized 90% of them. The results were more variable for the use of computers by staff in local government offices. All staff at the Kagawa Prefectural office used computers, while in Tochigi Prefecture 97.8% of staff used them and 88.2% in Gunma Prefecture. However, in 36 prefectural administrations, computers were used by less than half the staff, indicating the slow pace of computerization.

Information Networks and Services for Local Citizens

In Gifu Prefecture, 98% of elementary, middle and high schools had access to the Internet, but in all other Japanese prefectures the ratio was below 40%.

The results were better for 17 types of on-line system to provide information to residents on topics such as local administration, public health, medical treatment and traffic conditions. Yamaguchi Prefecture had implemented 88.2% of the applications, while Osaka Prefecture and Tottori Prefecture had both implemented 82.4%. Additionally, 23 prefectures had introduced 50% or more of the applications.

Unfortunately, 31 prefectures had not implemented any systems for remote medical treatment, or telemedicine. The best result was achieved by Kochi Prefecture, which had implemented a small number of systems, followed by Wakayama Prefecture.

Prefectural Budgets for Computerization

The MPT survey showed that in fiscal 1997, 70% of prefectures had implemented schemes to support the introduction of computers and the use of computer networks. Of these, Gifu Prefecture dedicated 0.46% of its annual budget for this purpose, the highest percentage of all prefectures. However, 14 prefectures had no budget for promoting computerization and use of information networks.

Indices of Prefectures' Use of Information Systems

In order to monitor growth in this area, in fiscal 1997 MPT compiled indices to show prefectures' increasing use of computers and computer networks for administration and in providing information to residents, as well as their budgets for promoting use of the technology.

The indices show that most prefectures had higher scores for the use of computers in administration than for the use of networks for informing citizens **(Figs. 29 and 30)**. Most prefectures recorded low scores for budget allocations for computerization **(Fig. 31)**. By combining these three elements, an integrated index was devised, which shows that Gifu Prefecture was most advanced in the use of computers and information networks, with Osaka Prefecture second and Kyoto Prefecture in third place **(Fig. 32)**.

Fig. 29 Index of Local Government Use of Computers in Administration

Number of Prefectures

Mean: 13.6
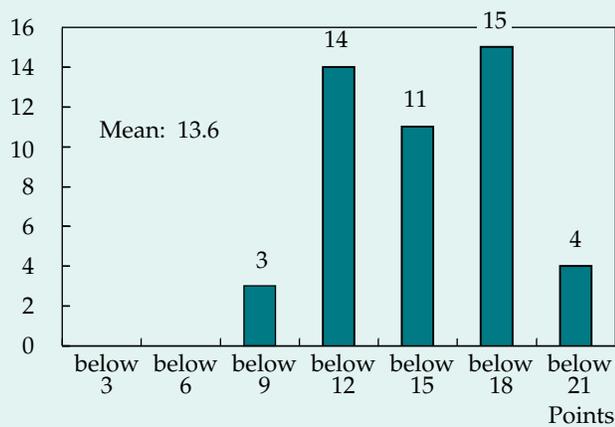
Source: MPT data

	Prefecture	Points
1	Osaka	20.8
2	Tochigi	20.3
3	Ehime	19.7
4	Gifu	18.1
5	Kagoshima	17.6
6	Niigata	17.5
6	Okayama	17.5
8	Miyazaki	17.2
8	Ishikawa	17.2
10	Kyoto	17.1

Fig. 30 Index of Local Government Use of Computers to Provide Information for Citizens

Number of Prefectures

Mean: 10.1
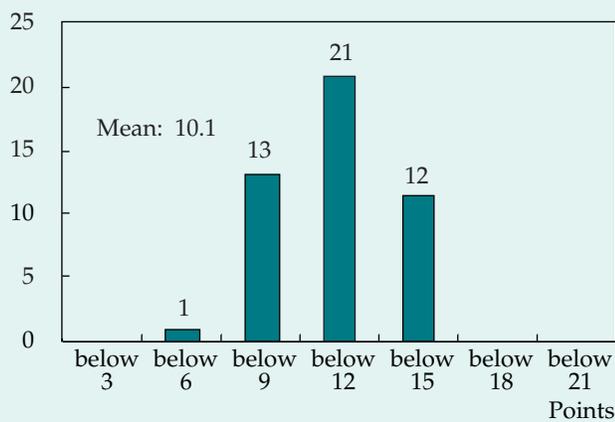
Source: MPT data

	Prefecture	Points
1	Ibaraki	14.9
2	Gifu	14.5
3	Shiga	14.1
4	Osaka	13.8
5	Aichi	13.5
6	Yamanashi	13.1
7	Saitama	13.0
8	Shizuoka	12.5
8	Oita	12.5
10	Toyama	12.1
10	Kagawa	12.1

Fig. 31   Index of Local Government Budget Allocations for Computerization

Number of Prefectures

Mean: 5.7
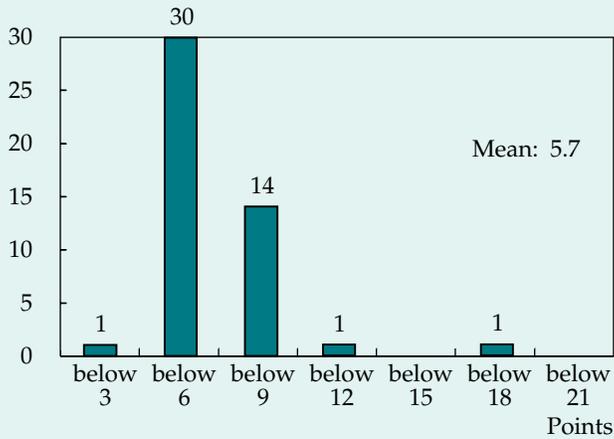
	Prefecture	Points
1	Gifu	15.7
2	Shimane	9.3
3	Hiroshima	8.3
4	Nagano	7.9
4	Kochi	7.9
6	Kyoto	7.8
7	Mie	7.7
8	Oita	7.6
9	Ibaraki	7.3
10	Aichi	7.1

(Bar chart: below 3 = 1, below 6 = 30, below 9 = 14, below 12 = 1, below 15 = 0, below 18 = 1, below 21 = 0; x-axis labeled Points)

Source: MPT data

Fig. 32 Integrated Index of Local Government Computerization

Number of Prefectures

Mean: 29.4
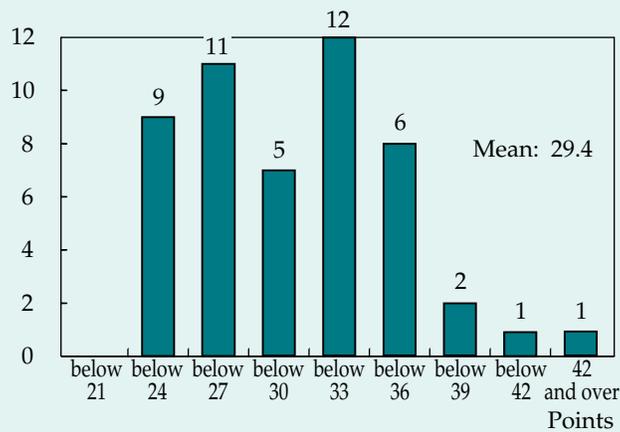
	Prefecture	Points
1	Gifu	48.3
2	Osaka	40.7
3	Kyoto	36.9
4	Ibaraki	36.3
5	Miyazaki	34.8
6	Kagoshima	34.7
7	Shiga	34.6
8	Ehime	34.1
9	Oita	33.4
10	Yamaguchi	33.2

(Bar chart: below 21 = 0, below 24 = 9, below 27 = 11, below 30 = 5, below 33 = 12, below 36 = 6, below 39 = 2, below 42 = 1, 42 and over = 1; x-axis labeled Points)

Source: MPT data
Note: This combines the indices shown in Figs. 30, 31 and 32.

8 International Trends

1 Telecommunications Services

Over the last few years, advanced telecommunications systems have been promoted in many countries around the world. In the United States, for example, the government has published a plan to implement a National Information Infrastructure by promoting the development of technologies and applications in info-communications. The U.S. Government spent about 4.6 billion dollars for that purpose between 1992 and 1996.

In 1992, the European Union took measures to promote the development of Trans-European ISDN and various applications, with the aim of implementing a Trans-European Network. For this purpose, the EU budgeted 5.36 billion ECUs through the European Investment Bank and extended certain member countries financial assistance worth a total of 470 million ECUs through the European Economic Area Fund for Development.

In Asia, the governments of Singapore and Malaysia have made a priority of building information infrastructure so as to contribute to their countries' economic growth and with the aim of making them regional business hubs.

Meanwhile, there has also been progress in less developed countries, especially through the use of new technology to introduce telecommunications services more quickly and cheaply. However, serious gaps remain between industrialized and developing countries with regard to basic telecommunications services, and the gaps are even wider in the area of advanced systems such as the Internet. It is in the interests of all the world's citizens that these discrepancies be corrected as swiftly as possible, thus accelerating social progress and economic growth across the globe.

2 Broadcasting Services

The digitization of broadcasting started when the first digital broadcasts via satellite began in the United States in June 1994. As of March 1998, there were four satellite broadcasting companies operating in the United States, two in Canada, two in Japan and one company in each of Hong Kong, Indonesia, Malaysia, South Africa and Australia. Additionally, 11 companies offered regional services in Europe while two companies did so in South and Central America. Meanwhile, test satellite broadcasting has begun in South Korea.

In 1998, pilot projects in the digitization of terrestrial broadcasting are due to be started in the United States, the United Kingdom, Spain and Sweden.

3 Globalization

The telecommunications industry is being restructured worldwide as deregulation opens national markets and an increasing number of global alliances are forged between companies.

The broadcasting industry too is undergoing similar restructuring, in response to growing competition in global markets.

Chapter *3*

INFO-COMMUNICATIONS POLICY

1 Measures by Central Government to Promote an Advanced Information and Telecommunications Society

1 The Advanced Information and Telecommunications Society Promotion Headquarters

In August 1994, the Advanced Information and Telecommunications Society Promotion Headquarters was founded as part of the Prime Minister's office, and since then it has been active in examining ways to improve and extend info-communications in Japan.

In September 1997, the headquarters established a study group on electronic commerce and related matters to examine how to mobilize administrative resources to promote electronic commerce in Japan, as well as the development of relevant technologies. In June 1998, the study group published a report on these issues, which recommended that the government support the promotion of electronic commerce and that Japan should contribute to global cooperation in establishing international rules for such commerce.

2 Promoting the use of Computers and Information Networks in Central Government Administration

In December 1994, the Japanese Cabinet approved a "Basic Plan for Promoting Administrative Informatization," which began implementation in fiscal 1995. A revised plan was approved by the Cabinet in December 1997 with the aim of responding to the development of the Internet and the growing need for computerization in government administration.

2 MPT Measures to Promote an Advanced Information and Telecommunications Society

1 Info-Communications Vision for the 21st Century

In February 1997, MPT asked the Telecommunications Council to establish an integrated policy to enhance info-communications in Japan and to promote the development of the sector through the early years of the new century to 2010. As a result, in June 1997 the council published a report entitled "Vision21 for Info-Communications." Its main recommendations were the promotion of reform in the telecommunications and broadcasting markets, development of advanced information infrastructure and applications, promotion of creative research and development in these sectors and creation of an environment that will nurture further advances. The report also analyzed the wide-ranging socio-economic consequences of developments in info-communications.

2 The Convergence of Telecommunications and Broadcasting

In August 1998, MPT convened a study group on the convergence of telecommunications and broadcasting, which produced an interim report in June 1997. The report discussed the likely effects of advances in info-communications and identified issues that need to be tackled, such as the protection of privacy and prevention of illegal activities via networks. A final report was issued in May 1998, which said that convergence should be regarded as leading to greater diversity of services, rather than homogenization. It also emphasized the need to establish suitable new regulatory frameworks in response to convergence.

3 Promoting Info-Communications in Local Areas

Regional Program to Promote the Use of Advanced Info-Communications

In October 1996, MPT convened a study group on ways to promote the growth of advanced info-communications systems in all regions of Japan. The study group issued a final report in May 1997, which recommended that local governments should cooperate in using information networks. It also presented targets for the establishment of broad access to multimedia in at least 300 of Japan's municipalities by 2000, in a third of all municipalities by 2005 and all of them by 2010.

Encouraging Commerce through Use of Multimedia

MPT decided in fiscal 1997 to begin a project in fiscal 1998 to promote the use of multimedia and other advanced communications systems in commercial districts throughout Japan. The aim is to help revitalize commercial activity and encourage consumer spending.

4 Building Advanced Info-Communications Infrastructure

MPT continues to promote the development of a nationwide optical fiber network that will serve as basic infrastructure for the Advanced Information and Telecommunications Society of the 21st century. In November 1997, the Council of Ministers for Economic Policies decided to strive to bring forward the date of completion of the network from 2010 to 2005, through harnessing the energy and resources of the private sector.

5 Helping New Entrants into the Info-Communications Business

In May 1998, the Telecom Venture Business Fund was established by MPT. The fund allows investment partnerships to be established between private firms and the government, which will use finance from the special account of a state budget for industrial investment. The aim is to encourage investment in new entrants in the telecommunications and broadcasting business, who usually face high risks in their initial stage of operation.

6 Assisting Elderly and Disabled Citizens

Telework Centers

In fiscal 1998, MPT began subsidizing organizations and municipalities which set up telework centers for elderly and disabled citizens. The facilities give such people greater opportunities to work by means of info-telecommunications systems, or otherwise extend their active participation in society.

Subtitles and Narration on Television Broadcasts

People with hearing difficulties can have much greater access to television programs when subtitles appear on screen. Also, when extra narration is included people with poor vision can be helped to enjoy programs. Therefore, in May 1997, MPT partly revised the Broadcast Law and the Cable Television Broadcast Law to promote broadcasting with subtitles and narration features.

7 Environmental Protection

The Telecommunications Council's Report on Global Warming

MPT submitted an inquiry to the Telecommunications Council in September 1997, concerning ways in which info-communications might be used in efforts to protect the global environment. The council's interim report about global warming issues was prepared in November 1997, and a final report was issued in May 1998. It estimated that emissions of the greenhouse gas CO_2 would be significantly reduced by the greater use of info-communications. Therefore, among its eight recommendations the report listed the promotion of info-communications systems that can, for example, reduce the need for commuter traffic. It also suggested that technology should be developed to better monitor environmental data and that education on environmental issues should be promoted.

Telework by Government Employees

From October 1997, MPT initiated a program allowing staff to work from their homes or telework centers. This is the first telework program for government employees in Japan, and the expansion of such telework is expected to assist in environmental protection through reducing commuter traffic.

Telework at a MPT telework center

3 Policies to Promote the Telecommunications Industry

1 Creating Dynamism in the Telecommunications Industry

The Reorganization of NTT

Having examined ways to restructure NTT on the basis of the Cabinet's revision of the Deregulation Action Program in March 1996, in December that year MPT put forward a policy for reorganizing the carrier. This splits NTT into two regional companies covering east and west Japan, as well as a long-distance company which is allowed to enter the market for international telephone services. There is also an overall holding company which will not have operational responsibilities. These changes were made possible by revision of the Nippon Telegraph and Telephone Corporation Law in June 1997.

Interconnection Policy

In order to promote the growth of telecommunications

networks in Japan, it is important for new entrants to the market to be able to connect easily with the networks of existing carriers. In December 1996, the Telecommunications Council issued a report entitled "Basic Rules for Interconnection." Based on the report's recommendations, MPT proposed revisions to the Telecommunications Business Law Enforcement Regulations in June 1997, and the revised regulation came into effect in November 1997. Its provisions oblige Type I telecommunications carriers to allow interconnection with their services as a general principle, and it establishes systems for ensuring interconnections are made transparently, fairly and promptly.

Deregulation

Included in the emergency economic stimulus package adopted by the Cabinet in November 1997 were measures that recognized the importance of telecommunications in Japan's economy. The package proposed wide deregulation of various areas of telecommunications business, the simplification of official procedures and the abolition of the KDD Law.

In May 1997, these measures began to be implemented with the revision of the Telecommunications Business Law, making it easier to enter the Type I telecommunications sector. December 1997 saw the official approval in Japan of public-leased-public telecommunications connections, in which leased circuits are connected to the public telecommunications network at both ends. The measure resulted in the complete deregulation of leased-circuit usage, and is expected to contribute greatly to the growth of telecommunications business.

2 Advancement and Diversification of Networks

Study of the Advancement and Diversification of Networks

Between March and December 1997, an MPT study group discussed measures to promote the smooth advance and diversification of communications networks in Japan, taking into account rapidly evolving technologies and the increasingly diverse and sophisticated needs of users. The study group's final report recommended the promotion of R&D, as well as the development of new applications, through making the market more competitive.

Wireless Access Systems for Subscribers

Establishing wireless systems for access to communications networks is an effective way to introduce competition into Japan's regional telecommunications markets and prompt the rapid diffusion of multimedia applications. Such wireless systems are expected to complement the nationwide optical fiber network now under construction. In July 1997, MPT asked the Telecommunications Technology Council to study the technical conditions that would enable wireless access systems for subscribers to use applications faster than current systems. The council reported its conclusions in March 1998, and in July MPT asked the Radio Regulatory Council to discuss the revision of regulations to allow the introduction of a wireless access system using 1.9 GHz.

3 Promotion of Mobile Telecommunications

Next-Generation Mobile Communications System (IMT-2000)

In October 1996, MPT set up a study group on a Next-Generation Mobile Communications System which could transmit data at high speeds (for example, at up to 2 Mbps or simple animation), could be used worldwide with common equipment and could provide as high quality connections as fixed networks. The group prepared a report in June 1997, and in response MPT asked the Telecommunications Technology Council to investigate the technical requirements for implementing the next-generation mobile communications system. The council organized a committee to devise domestic technical standards, which is expected to report its recommendations by April 1999.

Intelligent Transport Systems (ITS)

Intelligent transport systems (ITS) use the most advanced info-communications technology to link information on traffic conditions with vehicles and their drivers. ITS can include advanced navigation systems, electronic toll collection and other systems that help to improve driving safety, optimize traffic control and make road management more efficient. In July 1996, MPT joined the National Police Agency, the Ministry of International Trade and Industry, the Ministry of Transport and the Ministry of Construction to produce an outline plan for promoting ITS in Japan over the coming 20 years.

Communications via the Stratosphere

As a less costly supplement to satellite communications, it is possible to transmit telecommunications and broadcasting signals via an airship in the Earth's stratosphere at an altitude of about 20 kilometers. In December 1996, MPT inaugurated a study group on the Implementation of a Stratospheric Wireless Relay System, and in May 1997 the group prepared a report to highlight technical issues and a development policy for promoting a "Sky-Net" system in Japan. During fiscal 1998, MPT will draw up detailed plans for development of the project.

4 Enhancing Electronic Commerce

As in fiscal 1997, MPT will continue research and development in fiscal 1998 of business applications for the next-generation Internet to promote electronic commerce. These applications will feature a higher degree of security and will meet the need for ultra-high speed and large capacity data transmissions.

5 Protecting Users of Info-Communications

Content of Computer Networks

Many complaints have been made against telecommunications carriers who provide network services when users find content they consider obscene, offensive or libelous. People also complain when networks such as the Internet are used to distribute information that is dangerous, illegal or fraudulent. The question of liability for such content has yet to be resolved. Therefore, in October 1997 MPT established a study group on the issue and in December 1997 issued guidelines on the content of information on the Internet.

Mobile Telecommunications

With the rising use of mobile communications in Japan, there has been growing concern over the effect of associated radio waves on the human body. The Telecommunications Technology Council issued guidelines on this matter in June 1990. MPT subsequently refined the guidelines, and in November 1996 asked the Telecommunications Technology Council to examine the issue further. The council's report in April 1997 recommended that government, industry and academia should cooperate in research into the effects of radio waves on humans in order to create effective guidelines on exposure.

4 Policies to Promote Broadcasting

1 The Digitization of Broadcasting

The digitization of terrestrial broadcasting not only helps to make more effective use of frequencies; it is also essential for the creation of a society that makes full use of multimedia. MPT is therefore making plans for broadcasting formats and channels in Japan, so that a digital terrestrial broadcasting system will be able to start before 2000.

Satellite Broadcasting

In October 1997, MPT held an official inquiry into new entrants into the broadcasting business via broadcasting satellite (BS), in preparation for the opening of a digital broadcasting service via the Second Launched BS-4 satellite by the year 2000. In February 1998 the ministry also mapped out

broadcasting formats for BS broadcasting in response to a report from the Telecommunications Technology Council and submitted proposals to the Radio Regulatory Council concerning legal revisions, such as a change in the Basic Plan for Broadcast Propagation. In line with these measures, in fiscal 1998 MPT is due to select which new entrants it will license as BS broadcasters.

Cable Television

Meanwhile, in December 1996 MPT outlined technical standards for a digital transmission mode of cable television which can coexist with the current analog mode. In July 1998, a company providing cable television in Japan began digital broadcasting using the new mode. Since 1997, MPT has also been researching the optimum technical conditions for a cable TV system using

full digital transmission instead of a mixture of analog and digital methods, to satisfy growing demand for faster and larger capacity systems.

2 Improving Content for Multi-Channel Broadcasting

Various projects have been carried out to improve broadcasting content in recognition of the importance of the advent of multi-channel broadcasting and the advance of globalization. In response to a report from an MPT study group, in May 1997 the ministry amended the provisions of the Broadcast Law and the Cable Television Broadcast Law so as to cope with new trends such as multi-channel broadcasting. These revisions also aimed to contribute to the healthy growth of broadcasting in Japan by such measures as strengthening the authority of the Council on Broadcasting Content.

3 International Broadcasting

The growth of international broadcasting can do a great deal to expand international exchanges and understanding. Therefore, the Japanese government supports efforts such as those of NHK to extend its broadcasts to almost all parts of the world during fiscal 1998.

4 Promotion of Broadcast Programming

In September 1996 MPT formed a Study Group for Promoting Broadcast Programming which examined policies on how to finance the creation of programs in Japan and how to distribute them to other countries. A report was issued in May 1997.

5 Deregulation of Broadcasting Business

Multi-channel CS Digital Broadcasting
March 1998 saw an easing of regulations that had been designed to prevent one company from managing many television stations providing digital broadcasts via communications satellite (CS). The minimum ratio of investment in a CS digital broadcaster which gave voting rights on its board of management was raised from 10% to 33%. Moreover, the maximum number of television programs that could be provided by one supplier

Digital terrestrial broadcasting antenna for experimental purposes

was raised from twelve to an unlimited number transmissible via four transponders.

Pay-to-View CS Digital Broadcasting
From November 1997, pay-to-view programs have been able to be transmitted in Japan via CS digital broadcasting simply by companies notifying MPT, rather than requiring prior approval. In addition, the notification procedures were simplified. This easing of regulations is aimed at promoting competition.

Cable Television
In February 1998, Type I telecommunications carriers which also provide cable television became exempt from restrictions on their ratio of foreign capital and prohibitions on non-Japanese nationals becoming executive officers or directors. In addition, from September 1998, usage of wireless systems will be authorized as a supplementary means to extend the networks of cable television stations.

5 Promoting Use of the Post Office Network

## 1 The Post Office Network and the Community

Post Office Vision Toward the Year of 2010

In response to an inquiry from MPT in February 1997, the Postal Service Council published a report in July 1997 entitled "Post Office Vision Toward the Year of 2010: Infrastructure for Citizen's Lifestyle - A Base for Information, Peace of Mind, and Human Relations," concerning the future status of Japan's post office network and ways to expand its contribution to society as a whole. The report concluded that post offices have a unique position as infrastructure that is accessible to all citizens, and thus able to act as a basis for information and communications, including in times of emergency. The report also proposed ways to enhance the performance of post offices by, for example, allowing their premises to be used by community groups or to provide some administrative services for local governments.

Post Offices and Multimedia

MPT has looked into various ways in which multimedia and information networks can be used to improve post office services. As a result, it has opened homepages on the Internet providing services such as information on postal savings and life insurance. In 1998, the ministry is due to expand the services available through these homepages, including the inauguration of English versions for the convenience of foreign residents.

Meanwhile, from November 1997 to January 1998 an experimental "One-Stop Government Services" began to be provided through post offices in Tokyo's Taito Ward, as well as in the city of Okazaki in Aichi Prefecture and in Taketomi in Okinawa Prefecture. The trial system aimed to let users make on-line applications for various local government services from information terminals installed in post offices.

電子郵便局 (Electronic Post Office)　郵便 (Postal Services)　郵便貯金 (Postal Savings)

お知らせ (News)　簡易保険 (Postal Life Insurance)　その他CD-ROM (Other CD-ROMs)

お客さまの声 (Customers' Comments)

ご覧になりたいメニューにさわってください。　総合案内 (General Information)　わからない時はここを押してネ　使い方
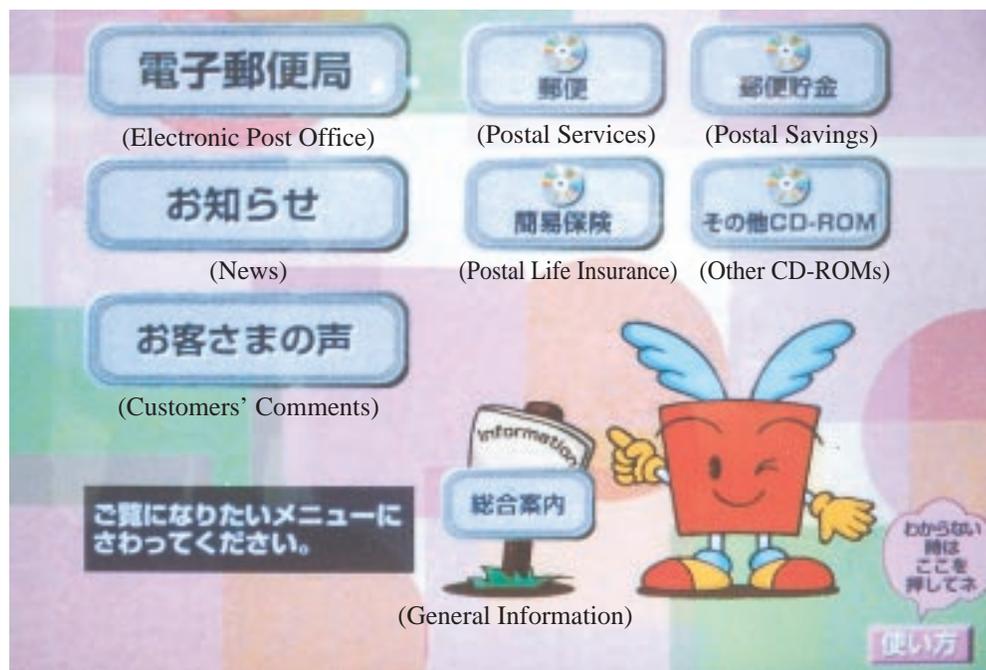
Main menu for the Electronic Post Office

Supporting the Elderly at Home

In August 1997, MPT put into operation the "Himawari Service" to help support elderly people in their homes. The service mainly targets people aged 70 or more living alone in sparsely populated areas. It uses post office delivery staff to keep an eye on elderly people and provide friendly conversation when delivering or collecting mail. In addition, the staff can take orders for the delivery of daily necessities, in cooperation with local welfare associations, and from time to time they bring letters written specially to the elderly residents by local primary school pupils.

Postal Savings and Insurance as a Basis for Japan's Economy

Post office savings accounts have long played a central role in mobilizing finance for the development of Japan. Postal saving funds form a major part of treasury investment and loans. In addition, life insurance schemes provided through post offices offer not only a vital service to citizens; they also provide further funds for public investment.

2 Plan for Postal Information Infrastructure (PII)

At the start of fiscal 1998, MPT outlined a plan to create a new national Postal Information Infrastructure (PII) over the target period of five years from fiscal 1998 to fiscal 2002. The planned PII is based on proposals from the business sector and local government, and is in line with the Cabinet's overall goal of intensifying the use of computer networks in administration. It is envisaged that the PII will provide a fully integrated network for postal savings and banks and the expansion of on-line administrative services, as well as promotion of R&D in relevant fields.

6 International Responses to the Globalization of Info-Communications

1 The G7 Targets Info-Communications

In June 1997, the 23rd summit of the Group of Eight (G8) industrialized nations, including Japan, was held in Denver in the United States. The Denver Summit Statement by G7 included matters in the field of info-communications, such as support for an agreement to liberalize trade in information technology equipment and basic telecommunications services, as well as a call for action to promote the development of electronic commerce.

Additionally, a joint statement at Denver by the G7 plus Russia described the need for action on issues such as using computer and telecommunications technology in the fight against international terrorism and organized crime, as well as developing means to prevent terrorists from attacking electronic infrastructure.

2 Japan's Participation in International Organizations

The World Trade Organization (WTO)

As a member of the WTO, Japan played a leading part in negotiation of the Basic Telecommunications Agreement, concluded after lengthy debate on 15 February 1997. Under the agreement, 69 WTO member countries pledged to further liberalize telecommunications markets. Japan was one of the first nations to ratify the agreement, which came into effect on 5 February 1998.

The International Telecommunication Union (ITU)

Japan has been a member of the ITU and its predecessor organization since 1879, and has consistently taken an active part in ITU activities, such as by hosting in 1994 the first ITU Plenipotentiary Conference to be held in Asia. In fiscal 1997 also, Japan participated in many important ITU events, such as the World Radiocommunication Conference (WRC-97), which took place in Geneva, Switzerland, between October and November 1997. Among the primary themes of WRC-97 were the review of technical standards for broadcasting satellites, as well as the allocation of frequencies for new satellite communications systems.

In March 1998, Japan also took part in the meeting in Geneva of the ITU's World Telecommunications Policy Forum, a venue at which high level policy-makers are able to discuss issues of global significance in telecommunications. The subject of the latest meeting was trade in telecommunications services, including the urgent need to reform the international accounting and settlement system. Also in March, the ITU's World Telecommunications Development Conference was held in Malta. Japan made important contributions to its discussions, including a proposal that the ITU should inaugurate a worldwide technology development program. The program would bring together governments and the private sector to create systems and equipment that best match the needs of rural areas in developing countries, and thus help them to achieve a universal service for their citizens.

The Asia-Pacific Telecommunity (APT)
Japan has also been active in promoting the development of telecommunications at a regional level, mainly through its activities as a member of the Asia-Pacific Telecommunity (APT). In June 1997, a meeting was held in Bangkok between telecommunications administrations of APT member countries, as well as associate members, to discuss ways to promote development of an Asia-Pacific Information Infrastructure (AII). The meeting adopted an AII Action Plan in addition to 14 pilot projects. These included seven projects proposed by Japan, such as schemes to provide training to remote locations via the Internet, opportunities for telework, and the testing of a next-generation system of electronic commerce.

3 Promotion of International Cooperation

Info-communications is essential infrastructure for every nation's economic and social progress. However, building that infrastructure takes a lot of resources in terms of money, technology and trained personnel. In all those areas, it is increasingly important for industrialized countries to assist developing ones so that they can enjoy the full potential of info-communications. Japan continues to play its part in that effort, and to make a major contribution to the development of the info-communications sector in developing countries through such means as Official Development Assistance (ODA). For example, in fiscal 1997, a total of 689 people from countries around the world were invited to participate in training courses in Japan on technical and management aspects of telecommunications and broadcasting.

7 Technological Development and Standardization for the 21st Century

1 Promotion of Technological Development in Info-Communications

Research and Development in Info-Communications Technology
In September 1996, MPT asked the Telecommunications Technology Council to review its proposals for promoting technological development in info-communications in line with the government's Science and Technology Basic Plan, published in July 1996. As a result, in April 1997, the council issued a revised version of its Master Plan for Research and Development in Info-Communications Technology (2nd Edition).

Since fiscal 1996, MPT has also encouraged R&D in info-communications through inviting academic bodies and private organizations to apply for MPT funds. In fiscal 1998, MPT began to assist projects on technology that can establish international standards, as well as projects to develop technology to meet local needs in the regions of Japan.

Promoting R&D in Info-Communications
MPT convened in October 1996 a study group on how to promote fundamental research in the info-communications sector in preparation for the demands of the new century. The study group's final report, issued in May 1997, identified important areas for research, such as the creation of user-friendly communications systems, as well as recommending an improved evaluation system for

R&D.

2 Promotion of Standardization

In an era of global competition, it has become vital to establish worldwide technical standards in telecommunications, and to develop systems and equipment that meet those standards. In April 1997, MPT received a report on these issues from the Telecommunications Technology Council. The report described ten areas in which standardization is a priority, and outlined the role of the government and the private sector in promoting standardization.

Seamless Technology

Meanwhile, in August 1996, the MPT convened the Study Group on Seamless Communications Technology, which reported in April 1997. The group examined how to improve the interface between different types of media that are now relatively difficult to interconnect, such as CATV and the Internet. It aimed to find ways to standardize signals and other factors that would help to create seamless systems of info-communications.

8 Space Communications Policy

1 Research and Development of Advanced Space Communications Technology

Engineering Test Satellite VIII

Work on building Japan's Engineering Test Satellite VIII (ETS-VIII) started in fiscal 1998, with the aim of launching the satellite in fiscal 2002. The purpose of ETS-VIII is to help develop the technology needed for mobile multimedia satellite communications systems, as well as mobile multimedia satellite broadcasting systems.

Ultra-High-Data-Rate Communications Technology Satellite

The purpose of the satellite, which it is aimed to launch in fiscal 2002, is to establish satellite communications technology with a transmission capacity of about 1 gigabit per second. This would allow satellite communications to be seamlessly connected to the terrestrial optical fiber networks.

The technology will also make a large contribution to the building of the Global Information Infrastructure, as well as enabling users to gain faster access to networks such as the Internet.

2 International Development of Satellite Communications Applications

As part of a G7 project to develop a Global Interoperability for Broadband Network (G7 GIBN Pilot Project), in fiscal 1997 MPT supported participation in tests of high data-rate satellite communications between Japan and Europe, Japan and the United States and Japan and South Korea. MPT also promoted the development of domestic application experiments. All these efforts were prompted by the Satellite Communications Application Experiments Promotion Conference, established by MPT in October 1997 in cooperation with industry and the academic world.

9 Safeguarding Communities from Natural Disasters

1 MPT Measures in Emergencies

Like every other part of government, MPT must play its part in helping people in Japan at times of natural disasters or other emergencies. With regard to postal services, MPT provides support by giving ready-franked postcards to disaster victims, and by not charging postage on relief goods, money orders or mail sent to victims of a disaster. It also puts priority on helping people to get swift access to their post office savings or to settle claims under the postal insurance system, as well as to distributing funds from charitable accounts. If the need arises, MPT can take further measures, including the free provision of mobile telephones in disaster areas.

2 The Post Office and Disaster Prevention

Local Bases of Information

Since almost everyone in Japan lives within a short walk of a post office, it is clear that they can play an important role as centers of information and support in times of emergency. In fiscal 1997, MPT began tests of a system to link terminals at local post offices to the computer networks of local governments, enabling post offices to function as bases for essential information that are most likely to be accessible to the public, even if disaster strikes. As of February 1998, a total of 983 municipalities in Japan had agreed to link with local post offices to provide emergency support.

MPT Emergency Management System

Because of the importance of post offices in disaster prevention, MPT is building the MPT Emergency Management System, which, through a computer network, can quickly provide reports on the operational status of post offices in emergencies. The system will be implemented fully in fiscal 1998.

3 Earthquake Prediction Using Info-Communications

Space Geodesy Technology

In fiscal 1995, MPT completed a system to monitor movements in the Earth's crust that could cause earthquakes in Tokyo and surrounding areas. Using Very Long Baseline Interferometry (VLBI) and Satellite Laser Ranging (SLR), as developed by the Communications Research Laboratory, the observation system can show crust deformations to an accuracy of just a few millimeters. In fiscal 1997, the ministry continued to refine the monitoring system, including through the use of real-time VLBI equipment with the highest performance standard in the world.

Appendix

1 DOMESTIC COMMUNICATIONS VOLUME

(FY end)

	1993	1994	1995	1996	1997
Total number of mail items (millions)	24,351	23,912	24,663	25,358	25,633
Total number of telephone calls (millions)	79,443	83,261	84,710	88,229	–
Total number of telegrams (millions)	45.0	43.3	41.4	40.2	–
Daily average television broadcasting hours	20.10	19.95	20.47	20.95	20.12
Telephone subscriptions (thousands)	58,830	59,936	60,798	61,259	61,244*
High-speed digital circuits	26,438	39,951	71,111	127,755	163,477*
Radio paging subscriptions (thousands)	8,070	9,350	10,610	10,080	8,980*
Cellular telephone subscriptions (thousands)	2,131	4,331	10,204	20,880	26,090*

Sources: MPT and NTT data; *Programing Statistics*, The National Association of Commercial Broadcasters in Japan.
Notes: The number of telephone calls is an estimate based on special surveys.
　　　The figures of 1993 are the average of 120 companies, those of 1994 are the average of 121 companies, those of 1995 & 1996 are the average of 124 companies, and those of 1997 are the average of 126 companies.
　　　An asterisk (*) indicates data as of the end of September 1997.

2 INTERNATIONAL COMMUNICATIONS VOLUME

(FY end)

	1992	1993	1994	1995	1996
Total number of mail items (millions)	334.6	345.4	366.0	403.7	429.7
Total number of telephone calls (millions)	481.4	526.5	599.4	683.2	761.2
Total number of telegrams (millions)	0.4	0.3	0.3	0.2	0.2
Total number of telex calls (millions)	11.1	9.0	7.1	5.8	5.0
Total number of leased circuits	1,654	1,676	1,644	1,691	1,771
Overseas broadcasting (hours per day)	53	60	65	65	65

Source: MPT
Note: International telephone calls, telexes, and telegrams include calls relayed.

3 TELEPHONE SUBSCRIBER TRAFFIC

(FY end)

	1992	1993	1994	1995	1996
Number of calls (million calls)					
Local calls	50,391	51,282	52,860	52,192	52,672
Within 100 km	20,182	21,143	22,786	24,635	27,187
Over 100 km	6,676	7,017	7,614	7,883	8,370
Total	77,250	79,443	83,261	84,710	88,229
Hours of calls (million hours)					
Local calls	2,140	2,181	2,227	2,180	2,166
Within 100 km	1,133	1,179	1,249	1,240	1,227
Over 100 km	413	433	465	469	468
Total	3,686	3,794	3,941	3,888	3,862

4 NUMBER OF PUBLIC TELEPHONES

(FY end)

Type	1993	1994	1995	1996	1997*
Outside public telephones	786,123	801,934	800,518	795,101	**786,278**
	(776,375)	(801,909)	(800,518)	(795,101)	**(786,278)**
In-store public telephones	35,168	40	0	0	**0**
Total	821,291	801,974	800,518	795,101	**786,278**

Notes: Figures in parentheses show the number of telephones that take telephone cards.
　　　An asterisk (*) indicates data as of the end of September.

5 NUMBER OF CIRCUITS FOR HIGH-SPEED DIGITAL TRANSMISSION SERVICES

(As of September 30)

	1996	1997
High-speed digital transmission services	97,465	**163,477**
Satellite digital leased circuit services	6	**4**
Satellite video communications services	7	**3**
TV broadcasting relay (number of terminal circuits)	752	**769**
Image transmission services	3,470	**2,150**
Wireless leased services (number of subscriptions)	479	**481**

6 NUMBER OF CONTRACTS FOR CIRCUIT-SWITCHING SERVICES AND PACKET-SWITCHING SERVICES

(FY end)

	Circuit-switching services	Packet-switching services
1993	6,292	410,543 (370,833)
1994	4,948	447,479 (410,739)
1995	4,447	465,881 (432,457)
1996	3,865	476,609 (444,788)
1997*	**3,691**	**479,715 (448,946)**

Notes: Figures in parentheses show the portion of Type II services.
　　　An asterisk (*) indicates data as of the end of September.

7 INTERNATIONAL LEASED CIRCUITS

(FY end)

	1992	1993	1994	1995	1996
Voice- grade circuits	435	328	285	189	**190**
Telegraph circuits	268	245	212	185	**164**
Medium- and high- speed code transmission circuits	951	1,103	1,147	1,317	**1,417**
Total	1,654	1,676	1,644	1,691	**1,771**

8 NUMBER OF GENERAL TYPE II TELECOMMUNICATIONS CARRIERS BY SERVICE TYPE

(FY end; number of companies)

	0 300 600 900 1,200 1,500 1,800 2,100 2,400 2,700 3,000 3,300	
Voice transmission services	1996 ▬	2,023
	1997 ▬	**2,394**
Image transmission services	▬	482
	▬	**660**
Data transmission services	▬	2,194
	▬	**3,012**
Complex services	▬	734
	▬	**1,100**

9 REPRESENTATIVE USES OF RADIO FREQUENCIES

Frequency	Wavelength	Name	Typical uses
3 kHz-	100 km	Very low frequency (VLF)	
30 kHz-	10 km	Low frequency (LF)	Maritime and Aeronautical radio beacons Decca (Radio navigation)
300 kHz-	1 km	Medium frequency (MF)	Maritime and Aeronautical radio beacons Maritime communications Medium-wave broadcasting (AM Radio broadcasting)
3,000 kHz- (3 MHz)	100 m	High frequency (HF)	Maritime and Aeronautical communications Shortwave broadcasting International broadcasting Citizen band
30 MHz-	10 m	Very high frequency (VHF)	Air traffic control communications Coastal wireless telephones TV broadcasting FM radio broadcasting Anti-disaster administrative radio system Radio paging Land mobile communications Amateur radio
300 MHz-	1 m	Ultra-high frequency (UHF)	Aircraft telephones TV broadcasting Anti-disaster administrative radio system Mobile/car phones PHS Land mobile communications Cordless telephones VICS (Vehicle information and communications system) GPS (Global positioning system) Amateur radio
3,000 MHz- (3 GHz)	10 cm	Super-high frequency (SHF)	Radar Radio astronomy Satellite broadcasting Telecommunications business/microwave relay for public services Broadcasting program relay Satellite communications
30 GHz-	1cm	Extremely high frequency (EHF) (Millimeter wave)	Radar Radio astronomy Central anti-disaster radio system Satellite communications Citizen radio Automobile radar system
300 GHz-	1mm	Sub-millimeter wave	Optical communications system
3THz (3,000GHz)	0.1mm	Optical range frequency band	

Note: The following terminology is not standard, but generally refers to the frequencies shown :
   Quasi-microwave = 1-3 GHz
   Microwave = 3-10 GHz
   Quasi-millimeter wave = 10-30 GHz
   Millimeter wave = 30-300 GHz

10 NUMBER OF RADIO STATIONS

(FY end; thousands of terminals)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Land mobile stations	1,066	1,197	1,452	1,916	2,581	3,497	4,098	5,051	7,770	14,192	**25,975**
Cellular telephones	95	151	243	490	868	1,378	1,713	2,131	4,331	10,204	**20,877**
Multichannel access (MCA) systems	112	159	235	338	460	569	659	741	819	880	**853**
Other land mobile stations	859	887	974	1,088	1,252	1,550	1,726	2,179	2,620	3,108	**4,245**
Convenience radio stations	2,038	2,164	2,268	2,321	2,410	2,473	2,506	1,641	1,325	1,173	**1,102**
Amateur radio stations	749	825	917	1,027	1,101	1,203	1,283	1,326	1,364	1,350	**1,296**
Other radio stations	303	295	318	347	376	401	406	374	375	601	**838**
Total	4,156	4,481	4,955	5,611	6,468	7,574	8,293	8,392	10,834	17,316	**29,211**

11 DAILY COMMERCIAL BROADCAST PROGRAMING: FACTS AND FIGURES

(October 1997–March 1998 averages)

	Radio		Television	
Type of program	Broadcasting time (minutes)	Percent of total	Broadcasting time (minutes)	Percent of total
News	181	12.9	248	19.6
Education (school coursework, etc.)	37	2.7	152	12.0
Culture and education	202	14.4	322	25.4
Entertainment	951	68.0	496	39.2
Advertisements	19	1.4	32	2.5
Others	8	0.6	16	1.3
Total	1,399	100.0	1,267	100.0

Source: *Programing Statistics*, The National Association of Commercial Broadcasters in Japan
Note: Figures are averaged from statistics on 97 AM, HF, and VHF radio broadcasters, and 126 TV broadcasters.

12 NUMBER OF NHK BROADCAST RECEPTION CONTRACTS

(FY end)

	1992	1993	1994	1995	1996
Contracts with owners of black-and-white TVs	1,126,167	1,039,792	970,555	865,815	**799,631**
Contracts with owners of color TVs	28,205,722	27,798,686	27,475,680	27,136,595	**26,844,744**
Color-TV satellite reception contracts	4,969,729	5,814,583	6,528,065	7,316,236	**8,109,762**
Black-and-white-TV satellite reception contracts	30,111	34,902	38,602	42,552	**46,092**
Satellite reception contracts with owners of TVs in poor-reception areas and in trains and other modes of transport	12,312	13,045	14,267	16,097	**15,794**
Total	34,344,041	34,701,008	35,027,169	35,377,295	**35,816,023**

Regions to which broadcasts are made	Region-specific broadcasting: Europe, North America, Central America, Africa, the Middle East and North Africa, South America, Hawaii, Russian Far East, Northern Asia, Central Asia, Southern Asia, Australia and New Zealand, Southeast Asia, Southwest Asia, the Philippines and Indonesia, East Asia, and North Korea (17 regions in total)
	General broadcasting: Worldwide
Broadcast time	Region-specific broadcasting: 34 hours per day
	General broadcasting: 31 hours per day
Languages Used	Region-specific broadcasting: English, German, French, Swedish, Italian, Spanish, Portuguese, Russian, Chinese, Indonesian, Malay, Thai, Burmese, Vietnamese, Hindi, Urdu, Bengali, Arabic, Swahili, Korean, and Farsi (Persian) (21 languages in total)
	General broadcasting: English and Japanese (2 languages in total)
Domestic transmitting stations	KDD Yamata Transmitting Station 7-300 kW and 4-100 kW transmitters (11 in total)
Relay broadcasting	Moyabi Relay Station, Gabon (leased service) 10 hours per day (8 hours to Europe and the Middle East and North Africa; 2 hours to South Africa)
	Sackville Relay Station, Canada (via a mutual exchange agreement and leased service) 8 hours per day (4 hours to eastern and south central areas of North America, 4 hours to central and western areas of North America)
	Montsinery Relay Station, French Guiana (service via a mutual exchange agreement) 7.5 hours per day (2 hours to Central America, 3.5 hours to eastern area of South America, 2 hours to western area of South America)
	Ekara Relay Station, Sri Lanka (leased service) 10 hours per day (6 hours to South Asia, 4 hours to the Middle East and North Africa)
	Skelton Relay Staition, the United Kingdom (leased service) 10 hours per day (to Europe)
	Kranji Relay Station, Singapore (via a mutual exchange agreement and leased service) 14 hours per day (8 hours to Indo-China, 6 hours to Oceania)
	Ascension Relay Station (via a mutual exchange agreement and leased service) 6.5 hours per day (3.5 hours to Central Africa, 2.5 hours to West Africa, 0.5 hours to East Africa)
Shortwave international broadcasting	Kranji Relay Station, Singapore (via mutual exchange agreement and leased service) 14 hours per day (8 hours to Indo-China, 6 hours to Oceania)
Video international broadcasting	Regions to which broadcasts are made and broadcast time 5.5 hours per day (to North America), $4\frac{2}{3}$ hours per day (to Europe)
	Language used Japanese, English (to North America and Europe)
	Satellite used GE-2 (to North America), ASTRA 1-D (to Europe)

Note: Overseas broadcasting is transmitted around the world from Japan via shortwave by NHK's Radio Japan service under the requirements of the Broadcast Law. Programing consists of news, programs on Japan, and entertainment. In addition, special programs are directed specifically to Japanese nationals overseas during emergency conditions brought on by war, internal strife, coup d'état, or major natural disasters. Broadcasts utilize the 6-, 7-, 9-, 11-, 12-, 13-, 15-, 17-, and 21 MHz frequency bands.

## 14 NUMBER OF CABLE TV BROADCASTING FACILITIES

(FY end)

	1992	1993	1994	1995	1996
Licensed facilities (501 drop terminals or more)	1,371	1,491	1,623	1,738	**1,819**
Facilities requiring notification only (51–500 drop terminals)	30,400	31,599	32,747	33,782	**34,736**
Small facilities (50 drop terminals or less)	24,666	25,860	27,236	28,443	**29,917**
Total	56,437	58,950	61,606	63,963	**66,272**
Total number of subscribers	8,344,188	9,228,095	10,254,744	11,004,653	**12,629,438**

Note: Facilities that have 50 drop terminals or less but produce original programs are included in the category of facilities requiring notification only.

15 NUMBER OF CABLE TV BROADCASTING FACILITIES SUPPLYING ORIGINAL PROGRAMING

(FY end)

Year	Value
1992	563 (1,871)
1993	625 (2,422)
1994	740 (3,143)
1995	830 (3,637)
1996	**937(5,001)**

Notes: These figures exclude those broadcasters which are not actually in operation.
  Figures include cable TV broadcasters supplying original programing via channel leasing.
  Figures in parentheses show the number of subscribers in thousands.

16 NUMBER OF MAIL ITEMS HANDLED

(FY end; thousands)

		1993	1994	1995	1996	1997
Domestic	Letter-post items	23,949,999	23,534,035	24,262,872	24,971,279	**25,306,542**
	Parcels	400,535	377,509	400,183	386,422	**325,969**
	Subtotal	24,350,534	23,911,544	24,663,055	25,357,701	**25,632,511**
International (items sent)	Letter-post items	121,451	117,041	114,869	119,520	**122,001**
	Parcels	3,008	2,942	2,915	2,874	**2,627**
	EMS	4,055	4,497	4,992	5,431	**5,993**
	Subtotal	128,514	124,480	122,776	127,825	**130,621**
Total		24,479,048	24,036,024	24,785,831	25,485,526	**25,763,132**

17 INTERNATIONAL MAIL VOLUME BY REGION

(FY 1996; %)

Region	Sent			Received		
	Letter-post items	Parcels	EMS	Letter-post items	Parcels	EMS
Asia	30.5	41.7	65.0	21.7	33.0	58.1
North America	33.4	27.7	16.6	47.5	46.1	37.1
Europe	24.2	15.4	13.0	25.7	16.2	2.4
Central and South America	4.1	8.6	1.7	1.5	1.1	1.3
Oceania	6.4	5.7	2.7	3.3	3.3	0.7
Africa	1.4	0.9	1.0	0.3	0.2	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

18 NUMBER OF POST OFFICES

(FY end)

	1993	1994	1995	1996	**1997**
Ordinary post offices					
Collection and delivery post offices	1,268	1,267	1,260	1,262	**1,265**
Non-collection-delivery post offices	60	60	59	59	**59**
Subtotal	1,328	1,327	1,319	1,321	**1,324**
Special post offices	—	—	—	—	**—**
Collection and delivery post offices	3,721	3,697	3,692	3,682	**3,655**
Non-collection-delivery post offices	14,754	14,878	14,962	15,029	**15,109**
Subtotal	18,475	18,575	18,654	18,711	**18,764**
Postal agencies	4,616	4,619	4,614	4,606	**4,605**
Total	24,419	24,521	24,587	24,638	**24,693**

19 SUBSECTOR REVENUES IN THE COMMUNICATIONS INDUSTRY

(FY end; ¥ million; number of companies)

	1996 Records	1997 Targets
Telecommunications companies		
Type I telecommunications carriers	12,122,644 (136)	13,322,717 (136)
NTT and KDD	6,693,744 (2)	6,783,410 (2)
New common carriers	5,428,900 (134)	6,539,307 (134)
Type II telecommunications carriers	749,900 (362)	857,718 (362)
Special Type II carriers	602,339 (44)	697,400 (44)
General Type II carriers	147,561 (318)	160,318 (318)
Total	12,872,544 (498)	14,180,435 (498)
Total excluding NTT and KDD	6,178,800 (496)	7,397,025 (496)
Broadcasting companies (including NHK)		
Commercial broadcasters	2,544,501 (290)	2,626,064 (290)
Cable TV operators	127,312 (199)	152,101 (199)
Subtotal	2,671,813 (489)	2,778,165 (489)
NHK	587,613	610,997
Total	3,259,426 (490)	3,389,162 (490)
Total communications industry	16,131,970 (988)	17,569,597 (988)

Source: *Survey of the Communications Industry*
Note: Figures in parentheses show the number of companies responding to the survey.

20 FACILITIES INVESTMENT IN THE COMMUNICATIONS INDUSTRY

(FY end; ¥ million; number of companies)

	1993 Records	1994 Records	1995 Records	1996 Records	1997 Revised targets
Telecommunications companies					
Type I telecommunications carriers	2,638,096	2,670,930	3,308,492	4,121,863	4,283,396
	(106)	(117)	(132)	(138)	(137)
NTT companies and KDD	1,936,150	1,897,988	2,026,375	2,059,029	2,016,100
	(2)	(2)	(2)	(2)	(2)
New common carriers	701,946	772,942	1,282,117	2,062,834	2,267,296
	(104)	(115)	(130)	(136)	(135)
Type II telecommunications carriers	188,221	207,555	198,003	246,489	216,182
	(432)	(325)	(301)	(374)	(374)
Special Type II carriers	163,936	184,515	175,613	222,402	189,249
	(33)	(30)	(44)	(57)	(57)
General Type II carriers	24,285	23,040	22,390	24,087	26,933
	(399)	(295)	(257)	(317)	(317)
Total	2,826,317	2,878,485	3,506,495	4,368,352	4,499,578
	(538)	(442)	(433)	(512)	(511)
Total excluding NTT companies and KDD	890,167	980,497	1,480,120	2,309,323	2,483,478
	(536)	(440)	(431)	(510)	(509)
Broadcasting companies (including NHK)					
Commercial broadcasters	132,227	110,057	203,270	415,315	124,325
	(210)	(207)	(276)	(289)	(289)
Cable TV companies	68,971	46,547	45,825	72,510	103,586
	(213)	(225)	(257)	(207)	(207)
Subtotal	201,198	156,604	249,095	487,825	227,911
	(423)	(432)	(533)	(496)	(496)
NHK	58,766	59,556	59,797	62,984	64,669
Total	259,964	216,160	308,892	550,809	292,580
	(424)	(433)	(534)	(497)	(497)
Total communications industry	3,086,281	3,094,645	3,815,387	4,919,161	4,792,158
	(962)	(875)	(967)	(1,009)	(1,008)

Source: *Survey of Equipment Investments in the Communications Industry*
Note: Figures in parentheses show the number of companies responding to the survey.

21 ACCEPTANCE OF POSTAL SERVICE TRAINEES BY MPT

(FY end)

Origin	1993	1994	1995	1996	1997
Asia and Oceania	18	33	35	65	89
Middle East and Africa	9	13	16	16	14
Central and South America	2	2	2	0	3
UNDP and UPU Programs	0	2	0	0	6
APPU Staff Exchange	11	11	11	11	11
Others	2	5	4	16	13
Total	42	66	68	108	**136**

Note: UNDP=United Nations Development Program, UPU=Universal Postal Union, APPU=Asia-Pacific Postal Union

22 ACCEPTANCE OF TELECOMMUNICATIONS TRAINEES BY MPT

(FY end)

Origin	1993	1994	1995	1996	1997
Asia and Oceania	147	103	136	177	280
Middle East and Africa	65	74	98	81	87
Central and South America	85	76	70	80	57
UN Programs (ITU, etc.)	0	0	0	0	0
APT Program	57	82	114	113	165
Others	59	43	28	23	26
Total	413	378	446	474	**615**

Note: ITU=International Telecommunications Union, APT=Asia-Pacific Telecommunity

23 ACCEPTANCE OF BROADCAST TRAINEES BY MPT

(FY end)

Origin	1993	1994	1995	1996	1997
Asia and Oceania	49	19	57	35	35
Middle East and Africa	23	31	31	26	25
Central and South America	24	31	13	9	12
UN Programs (ITU, etc.)	0	0	0	0	0
Others	0	4	0	1	2
Total	96	85	101	71	**74**

Note: ITU=International Telecommunications Union

24 NUMBER OF EXPERTS DISPATCHED ABROAD

(FY end)

	1993	1994	1995	1996	1997
Via JICA:					
to the Asia-Pacific region	62	74	77	72	71
to the Near and Middle East and Africa	20	26	19	15	12
to Latin America	47	51	47	34	14
to Eastern Europe and Central Asia	0	2	2	1	1
to international organizations	8	10	6	4	12
Via UNDP/ITU	2	0	0	0	0
Via APT	0	2	0	0	0
Via UPU	1	2	2	2	3
Total	140	167	153	128	113

Notes: The figures include both experts newly dispatched in the year shown and those remaining from the previous year (including those whose term ended during the year shown).

Experts are sent to government communications agencies, public corporations, and training institutions of developing nations to provide guidance in communications project planning, operations, and maintenance and to instruct local staff, for the purpose of contributing to the economic, social, and personnel development of these nations.

25 YEN LOANS FOR COMMUNICATIONS PROJECTS
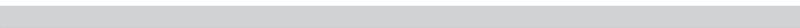
(FY end; ¥ million)

1993	55,719	(10)
1994	17,620	(2)
1995	23,227	(3)
1996	45,570	(6)
1997	**31,092**	**(4)**

Notes: Annual amounts were determined by diplomatic agreement.

Figures in parentheses show the number of projects.

26 GRANTS FOR COMMUNICATIONS PROJECTS

(FY end; ¥ million)
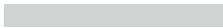
1993	9,927	(13)
1994	3,326	(6)
1995	4,939	(7)
1996	8,097	(9)
1997	**3,684**	**(5)**
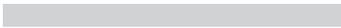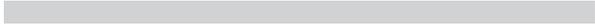
Notes: Annual amounts were determined by diplomatic agreement.

Figures in parentheses show the number of grants.