WHITE PAPER

Communications in Japan 1999

Ministry of Posts and Telecommunications
Japan

General Planning and Policy Division, Minister's Secretariat
3-2, Kasumigaseki 1-chome, Chiyoda-City, Tokyo 100-8798 Japan
Phone: +81-3-3504-4796 URL: http://www.mpt.go.jp/

Summary of Contents

Legend

- In this publication, "fiscal (year)" indicates the Japanese fiscal year, starting April 1 and ending next March 31.
- Following prefixes are used in this publication:

P (peta) = 10^{15}
T (tera) = 10^{12}
G (giga) = 10^{9}
M (mega) = 10^{6}
k (kilo) = 10^{3}
d (deci) = 10^{-1}
c (centi) = 10^{-2}
m (milli) = 10^{-3}
μ (micro) = 10^{-6}

As for the volume of infomation indicated in byte, the following prefixes are used:

G (giga) = 2^{30} (1,073,741,824)
M (mega) = 2^{20} (1,048,576)
K (kilo) = 2^{10} (1,024)

- Because figures used in this publication are rounded off, there may be discrepancies between the sum of figures and the total figure.
- Because percentages are also rounded off, the total of percentages may not add up to one hundred.
- Outlines of surveys referred to or used in this publication are listed at the end of the main section of this publication.
- Figures and tables without indication of sources in the information section of this publication are based on materials from MPT.

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Highlights of the 1999 White Paper "Communications in Japan"

Chapter I: Special Feature
-- Impact of the Internet on Japan

Introduction: Penetration of the Internet

- In March 1999, the number of Internet users worldwide was estimated at about 160 million.
- The number of Internet host computers around the world was estimated at about 43 million in January 1999, which is about 20 times more than in 1994.
- It is estimated that about 17 million people in Japan were Internet users in 1998. Five years after the launch of commercial Internet services, the Internet household penetration rate in Japan surpassed 10%.
- Between February 1998 and February 1999, there was a 240% rise in the total gigabytes carried on the Japan domain of the World Wide Web.

1. Recent international moves concerning the Internet

- In November 1998, the US government and the non-profit Internet Corporation for Assigned Names and Numbers (ICANN), based in the U.S., agreed that international management of domain names on the Internet would be handled mainly by ICANN.
- International frameworks for electronic commerce are being discussed at APEC and OECD meetings.
- In the U.S., the Next Generation Internet Research Act of 1998 has been approved. For the Next Generation Internet Research Program, 67 million US dollars are earmarked in the fiscal 1999 budget, while 75 million US dollars have been allocated in the fiscal 2000 budget.
- The European Commission has adopted a Directive that will require companies based in the European Union to abide by the national laws relevant to the companies' locations when conducting transactions with each other via the Internet.

2. Growing Internet business in Japan

(Unit: billion yen)

	1997	1998
Internet commerce in Japan	-	2,597.9
Products and services market	81.8	166.5
Raw materials market	-	2,431.4
Internet connection business	114.0	296.1
Internet-related business	2,555.7	3,693.9

- The size of the market for selling products and services via the Internet more than doubled in Japan between 1997 and 1998.
- The Japanese automobile and electrical machinery industries are major players in the market for raw material sales via the Internet.
- The Internet connection business offered by Internet service providers (ISPs) and others in Japan grew by about 160% between 1997 and 1998.
- In the same year, Internet-related business, such as Internet-related hardware, applications software, transaction settlement services and Internet advertisements, grew by about 40%.

3. The Internet in daily life

- According to various surveys conducted in fiscal 1998, an increasing number of Japanese women are using the Internet. A 1998 survey by the Ministry of Posts and Telecommunications (MPT), showed that new Internet users of both sexes are mostly accessing the network at home for hobbies and

entertainment.
- The MPT survey also revealed that young people who use the Internet mainly do so with the aim of making new social contacts. People aged over 50 who use the Internet generally do so for hobbies or education.
- Homemakers look to the Internet mainly to provide local information, as well as opportunities to work from home.
- Of women who work full time, 73.5% use the Internet regularly.
- The Internet is widely used in Japan for job hunting and recruitment. According to the MPT survey, in 1998, among all Internet users aged between 18 and 25 in Japan, 93.7% who were seeking jobs used the network to do so.

4. The Internet in the public sector

- Most Japanese government ministries now have Internet websites, where they offer a wide range of information and receive comments from the public.
- Among local governments, 61.5% had set up websites by the end of fiscal 1998, and the percentage is expected to reach 70% by the end of fiscal 1999.
- Among the websites of local governments around Japan, 94.5% provided information on tourist sites and local products, while 3.8% showed press releases.
- Use of the Internet in education is increasing in Japan. The Internet is used in school for distance learning and for communication between teachers and parents. In addition, universities have begun offering online courses for ordinary citizens.

5. Future outlook and challenges

(1) Improving the Internet environment
- According to an MPT study group, there is strong demand in Japan for tougher measures to protect the privacy of Internet users. In December 1998, MPT released "Guidelines on the Protection of Personal Data in Telecommunications Business."
- MPT's fiscal 1997 survey of individual users of telecommunications services found that, among all users of the Internet, 38.1% said they had been subjected to illegal or harmful information via the network.
- During 1998, the Japan Computer Emergency Response Team Co-ordination Center received 923 complaints from Internet users concerning unauthorized access to private information and other problems. This was an increase of 87.6% over the previous year. In April 1999, a bill was submitted the Diet on prohibiting unauthorized access, and technologies began to be developed to enable the tracking down of the origin of the unauthorized access.
- The Telecommunications Services Usage Survey conducted by MPT in fiscal 1998 showed that among corporate users of telecommunications services with at least 100 employees, 48.9% were concerned about the increasing transmission of computer viruses via the Internet. In June 1998, the Virus Consulting Center, non-profit organization, was established to provide information on computer viruses and how to eradicate them.

(2) Toward diffusion of the Internet
- An MPT survey in 1998 compared telecommunications charges in Düsseldorf, London, New York, Paris and Tokyo. It found that charges for the local telephone calls needed to connect to the Internet are about average in Tokyo, but that charges in New York are much lower than in the other cities. MPT will encourage the relevant charges in Japan to be reduced as much as possible.
- To encourage electronic commerce, MPT is closely studying the technological and legal aspects of introducing in Japan an electronic authentication system for documents and personal identification.
- According to a survey by the journal Nikkei Multimedia in December 1998, nearly 70% of Japanese people who shop via the Internet are worried about the protection of personal information. Services have been launched to provide secure financial transactions online.
- It is planned that every state school in Japan will be connected to the Internet by fiscal 2001. Internet service providers and telephone companies have offered specially reduced charges for schools, in response to a request from the Minister of Posts and Telecommunications.
- Only about 20% of elderly people in Japan and 30% of people with disabilities use the Internet. Measures need to be taken to increase such people's ability to use the network.

(3) Advancement of the Internet
- To accommodate the dramatic increase in Japan's Internet traffic, large-capacity wired networks are to be established as soon as possible.

- Measures are to be taken to further facilitate Internet access via mobile communications, including development of technologies to reduce interference.
- Research and development activities have been conducted on the next-generation Internet, which will enable ultra-high-speed, large capacity communications and thus advanced applications.

Chapter II: Info-communications in Japan

1. Info-communications industry

	1995	1997
Contribution to Japan's real gross domestic output	96 trillion yen	111 trillion yen
Contribution to Japan's nominal gross domestic product (GDP)	42 trillion yen	47 trillion yen
Employees	3,818,000	3,871,000

- The Japanese info-communications industry has continued to grow. In 1995, the contribution of the info-communications industry to real gross domestic output surpassed the figure for the construction industry. In 1997, it posted 111 trillion yen, accounting for 11.8% of the gross domestic output generated by all Japanese industries.
- In 1997 the contribution of the info-communications industry to nominal GDP reached 47 trillion yen, larger than the figure for the construction industry.
- The average annual growth of labor productivity in the info-communications industry from 1980 to 1997 marked a high rate of 5.2%.
- The number of employees in the info-communications industry increased only slightly between 1995 and 1997.

2. Communications and broadcasting business

- The number of telecommunications businesses in Japan has grown steadily.
  - In fiscal 1998, there were 179 Type I telecommunications carriers, up by 26 from fiscal 1997.
  - The total operating revenues for Type I telecommunications carriers during fiscal 1997 stood at 11,378.4 billion yen, up 10.7% from fiscal 1996.
- Stock prices for telecommunications sector have generally risen at a higher rate than the Tokyo Stock Price Index (TOPIX).
- Between 1991 and 1996, the telecommunications sector gained a higher percentage of new companies than any other industry in Japan. During 1992 to 1997, this sector has also had the lowest percentage of corporate failures among Japanese industries.

Rate of increase in the number of new companies by industry (1991-1996) and rate of business closure by industry (1992-1997)

(Unit: %)

	Rate of increase	Rate of closure
Construction	21.2	7.2
Manufacturing	-1.5	4.8
Wholesale	-3.6	9.1
Retail	7.4	4.5
Transport	8.7	5.8
Telecommunications	153.0	1.5
Services	15.2	3.8
Real estate	6.1	4.7

- Overall, the broadcasting business has seen steady growth.
  - The number of broadcasters operating in Japan at the end of fiscal 1998 was 1,149, up by 56 from fiscal 1997.
  - The operating revenues for all broadcasters totaled 2,801.9 billion yen in fiscal 1997, up 4.6% from fiscal 1996.
- The level of investment in the Japanese telecommunications and broadcasting industries has remained high.
- In the increasingly competitive market, there is a growing trend for telecommunications and

broadcasting businesses in Japan to seek mergers and tie-ups.

3. Info-communications network

- Trunk telecommunications networks have been developed and upgraded throughout Japan. In addition, some telecommunications carriers are building Internet Protocol (IP)-based networks.
- There is increasing diversity in the types of subscriber lines, following the advent of new access methods such as digital subscriber lines (DSL) and fixed wireless access (FWA) systems. These new methods were developed in response to growing demand for mobile communications and higher-speed data communications.
- At the end of fiscal 1997, there were 39.48 million terminals for wireless communications in Japan, up 35.1% from fiscal 1996.
- Across Japan, there were also 68,234 connection points for cable television service areas at the end of fiscal 1997.

4. Telecommunications service

- The number of subscribers to conventional wired telephone services in Japan has declined along with their amount of traffic; however, as a proportion of the total, the number of subscribers to services provided by new common carriers (NCCs) has increased steadily.
- The number of ISDN lines more than doubled in the twelve months up to September 1998, and the amount of traffic they carry rose dramatically.
- The number of public pay telephones in Japan at the end of fiscal 1997 was 778,470, down 2.1% from fiscal 1996.
- In 1997, international calls originating from Japan continued to outnumber incoming calls. The single country receiving the largest number of outgoing calls (21.4%) was the U.S., followed by China at 13.0%.
- In September 1998, the number of subscribers to cellular telephone services in Japan reached 36.54 million, a 40.1% increase over the previous year. The volume of traffic also rose.
- The number of PHS subscribers in Japan in September 1998 totaled 6.267 million, down 11.3% from September 1997. Nevertheless, the volume of traffic increased.
- For both domestic and international leased circuit services, demand shifted to higher-speed lines.
- Newly launched telecommunications services were mainly aimed at users of cellular and PHS telephones, focusing on data communications functions.

5. Broadcasting service

- There has been a steady rise in the number of subscribers to services provided via broadcasting and communications satellites.
- The number of subscribers to cable television totaled 14.482 million at the end of fiscal 1997, up 14.7% from fiscal 1996. More and more cable TV operators are also offering telecommunications services.
- Enrollment in the University of the Air continued to rise, reaching 67,990 students for the first term of fiscal 1998.
- In October 1998, international television broadcasting from Japan was extended to all corners of the world, except for West and Southern Africa.

6. Postal services

- There was a slight rise of 0.6% in the total number of mail items handled during fiscal 1998 compared with fiscal 1997.
- Postal services were enhanced by such measures as the launch of a new discount scheme for the bulk-mailing of all types of printed materials, including corporate brochures and catalogues as well as books, which had already enjoyed special postal rates. Fiscal 1998 saw the expansion of the service area for the "Morning 10" scheme, which guarantees delivery of mail by 10 a.m. the day after posting.

7. Tariffs

- Domestic and international telecommunications charges have been falling in Japan since 1990, and this trend continued in 1998.
- In a comparison between Düsseldorf, London, New York, Paris and Tokyo conducted in 1998, MPT found that although local call charges in Tokyo are about average, the initial charge for subscribing to a wired telephone line is relatively high.
- The survey also found that cellular telephone charges in Tokyo are about average, but that charges

for digital leased circuits (for 64 kbps and 1.5 Mbps) are higher than in the other cities.
- In a 1998 comparison between Japan, France, Germany, the UK and the USA, it was found that charges for mailing letters tend to be higher than average in Japan, but the charges for mailing postcards are relatively low.

8. Technology

- According to a survey of Japanese experts in the field, Japan's international competitiveness in information technology is similar to that of European countries but has been weakening in relation to the U.S.
- Japanese investment in R&D for the info-communications sector surpassed the three trillion yen mark for the first time in fiscal 1997.

Investment in research and development

(Unit: billion yen, %)

	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
A: All Japanese industries	9,054	8,980	9,396	10,058	10,658
B: Info-communications sector	2,381	2,387	2,584	2,912	3,084
B as a percentage of A	26.3	26.6	27.5	29.0	28.9

- Forums and consortiums organized by the private sector in many countries, but dominated by U.S. companies, are establishing unofficial global standards for information technology.

9. Use of info-communications technology

- In fiscal 1998, 80.0% of large companies (with at least 300 employees) in Japan used the Internet and 83.3% used LANs.
- In 1997, US capital investment in IT was about three times that in Japan. The ratio of investment in terms of GDP showed that the U.S. invested 1.7 times more than Japan.
- In fiscal 1998, of all households in Japan, 57.7% had cellular telephones and 11.0% had access to the Internet. Despite the economic recession, Japanese households have been spending a growing amount on communications since 1994.
- Individual ownership of equipment such as cellular telephones and computers is rising in Japan, alongside ownership by businesses. In 1998, of all individual computer users in their 30s, a total of 81.4% had exclusive use of their computers. More teenagers in Japan are paying for individual phone services. In 1998, of cellular subscribers aged 15 to 19, over sixty percent paid their telephone bills themselves.
- Users of mobile communications in Japan tend to frequently switch between types of service and carrier in the so-called "churn" phenomenon. Nearly half of all users have changed their model of cellular phone since first becoming a subscriber, while more than a third have switched to a new type of service.

"Churn" phenomenon in Japan's mobile communications market

	Percentage of users
Switched to another service	38.4
Switched to another carrier	17.2
Changed model of telephone	47.2

- More and more staff at national and local government offices in Japan are regularly using computers. Almost every administrative worker in national government now has a computer at his or her desk.
- A comprehensive system of distance learning via information networks is now in place at Japanese universities. At the end of fiscal 1998, a total of 83 institutions were participating in an inter-university distance learning project that uses satellite communications.
- Telemedicine is also being promoted in Japan. In December 1998, a total of 151 pilot projects in telemedicine were in operation, while 59 had already been completed.

10. Information flow

- Between 1988 and 1997, the growth in the volume of information distributed nationwide via all types of media outpaced the growth in real GDP.
- In fiscal 1997, of all information distributed in Japan, 20.1% originated from Tokyo, the highest figure

among all prefectures.

11. Trends abroad

- In the U.S., the Telecommunications Act of 1996 and technological breakthroughs have stimulated new entries into the info-communications industry, intensifying competition and restructuring.
- In the European Union, the total liberalization of the telecommunications market in January 1998 has intensified competition among carriers.
- Some Asian countries have seen delays in the development of communications networks due to the recent regional economic crisis.
- Terrestrial digital broadcasting was launched in the U.K. and in the U.S. in 1998.
- There is a growing trend towards global mergers and tie-ups between communications and broadcasting businesses.

Chapter III: Info-communications Policies

1. Governmental measures to promote advanced info-communications

- The Working Group on Electronic Commerce, formed under the Advanced Information and Telecommunications Society Promotion Headquarters, compiled a report in June 1998 entitled "Japanese Initiatives in Promoting Electronic Commerce." The headquarters also adopted a "Y2K Action Plan" in September 1998 to tackle the potential computer problems of the arrival of the year 2000, and in November issued "Basic Guidelines on the Promotion of an Advanced Information and Telecommunications Society."
- The advancement of info-communications in Japan was one of the major items targeted by the government's April 1998 "Comprehensive Plan for Financial Revitalization" and by the November 1998 emergency economic stimulus package.
- In January 1999, a strategic plan for improving the housing standards of people in Japan and an industrial revitalization plan were approved by the Cabinet. MPT, for its part, continued with efforts to expand the use of information technology in transport systems, to digitalize broadcasting and to develop next-generation info-communications infrastructure.
- In December 1998 the Prime Minister set up a task force, consisting of personnel from various ministries, which began three projects to spread the use of information technology in government administration, as well as another project to promote the spread of information technology in education.

2. Promotion of reform in the info-communications sector

- To promote further competition in Japan's telecommunications market, the KDD Law was abolished in July 1998. This was followed in November 1998 by revisions to tariff regulations and the classification of Type II telecommunications carriers.
- From May 1998, in order to expedite tariff setting procedures, Type I telecommunications carriers in general were made subject to a prior-notification system in setting their new telecommunications end-user tariffs, instead of having to obtain authorization from the Minister. In regional communications markets, where competition is yet to mature, a price-cap regulation was introduced.
- In May 1998, the Telecom Venture Business Fund was established with the aim of creating new info-communications businesses. Both the public and private sectors invested in the fund.

3. Network infrastructure development

- At the end of fiscal 1998, approximately 27% of the planned nationwide fiber-optic networks had been installed. Special loans were offered to telecommunications carriers for fiscal 1999 to help achieve the completion of the network by as early as 2005.
- In December 1998, MPT released basic guidelines for the introduction of a new fixed wireless access system using quasi-millimeter waveband and millimeter waveband frequencies. Introduction of the new system is expected to stimulate competition in Japan's local telecommunications markets and help satisfy the heavy demand for bandwidth to support growing multimedia services.
- In March 1999, a Task Group of the International Telecommunication Union's Radiocommunication Sector adopted a draft Recommendation on the basic parameters for radio transmission systems to be used for third-generation mobile communications systems, in a project called International Mobile Telecommunications 2000 (IMT-2000). The project aims to establish global standards that will allow people to use the same mobile phone anywhere in the world.

- To help businesses tackle the year 2000 computer problem as quickly as possible, in October 1998 MPT established a series of meetings between representatives of all sections of Japan's telecommunications industry, including carriers and manufacturers, to discuss Y2K issues in telecommunications. This was followed in March 1999 by the start of a similar series of meetings between broadcasting companies and the industrial sector on Y2K issues in broadcasting.
- Between September and December 1998, MPT decided a provisional terrestrial digital broadcasting system for television and radio and drafted a nationwide channel allotment plan, with the aim of completing the shift from analog to digital systems at all main terrestrial broadcasting stations by 2006. MPT also began practical large-scale field trials of terrestrial digital broadcasting in November 1998.
- Digital broadcasting via broadcasting satellites is scheduled to start in Japan in 2000. In July 1998, the Broadcasting Satellite System Corp. (BSAT) was authorized as a facility-supplying broadcaster by MPT, and in October 1998, 10 broadcasters were authorized as program-supplying broadcaster by MPT.

4. Promotion of research and development

- During fiscal 1998, the Japan Gigabit Network (JGN) was built for R&D purposes and 45 access points to these were set up nationwide. The network consists of ultrahigh-speed fiber-optic networks linking asynchronous transfer mode (ATM) switches nationwide and five shared-use research facilities throughout Japan.
- Government, industry and academia have jointly been promoting R&D on Stratospheric Platforms. In August 1998, the Telecommunications Advancement Organization of Japan launched the "Stratospheric Platform Project."

5. Environmental preparation for info-communications advancement

- From July 1998 to February 1999, MPT hosted the "Study Group on Improper Use of Info-communications and Appropriate Handling of Complaints." MPT also issued warnings to the public to guard against telephone message services, among others, being inappropriately used.
- To make it as easy as possible for elderly people and those with disabilities to make full use of info-communications, in October 1998 MPT released guidelines on designs for telecommunications and other equipment in public places, covering such factors as accessibility and ease of use. In December the same year, MPT and the Ministry of Health and Welfare jointly established the "Study Group on ways to realize 'Information Barrier-Free' Environment."
- Also in December 1998, MPT released revised "Guidelines on the Protection of Personal Data in the Telecommunications Business" in order to keep pace with developments and the increasing diversity in telecommunications services.
- During fiscal 1997, MPT received 1,071 complaints and inquiries about telecommunications services, a 240% increase over the figure for fiscal 1996. About 40% concerned domestic telephone services.
- In October 1998, the Rules for the Enforcement of the Radio Law were revised to promote the protection of the human body from damaging effects of electromagnetic waves. The revisions will take effect in October 1999.
- In response to public demand for the use of mobile telephones to be banned in theatres, concert halls and other public places, in December 1998 MPT began accepting license applications from experimental radio stations that aim to prevent radio waves from reaching mobile telephones in such places.
- In April, an interim report was published by the MPT study group that had been set up to investigate an incident in December 1997 in which some viewers of a children's cartoon program on television suffered fits and other ill effects. In the report, and in its final report in June, the study group proposed that broadcasters should voluntarily formulate guidelines regarding the colors and speed of frame changes in broadcasts, and other potentially hazardous factors for viewers. MPT hosted the "Study Group on Broadcasting and Young People" from May through December 1998, to discuss appropriate programming and other issues.

6. Promotion of IT in the public sector

- Through a project to promote inner-city prosperity through the use of multimedia, regional projects to build local information networks and other schemes, MPT is helping local public bodies to increase the use of information technology in their regions.
- In November 1998, a law was enacted to promote research and development of technologies to help advance the use of information technology in such areas of public interest as education, transport and administrative procedures. Ministries and agencies jointly promoted the introduction of IT in the

public sector.
- A report from the Telecommunications Technology Council in February 1999 estimated that, by 2005, about 330,000 people in Japan will be employed in the market for "Intelligent Transport Systems (ITS)." The Council also estimated that this market would be worth about 60 trillion yen by fiscal 2015.

7. Measures for globalization

- The Asia-Pacific Economic Cooperation (APEC) held its Ministerial Meeting on Telecommunications and Information Industry in June 1998. The Plenipotentiary Conference of the International Telecommunication Union (ITU) was convened in Minneapolis, USA, from October to November 1998.
- During 1998, both INTELSAT (International Telecommunications Satellite Organization) and Inmarsat (International Mobile Satellite Organization) were partially privatized in order to improve their competitiveness.
- During fiscal 1997, Japan gave assistance worth a total of approximately 38 billion yen to communications projects overseas. Of this amount, 6.9 billion yen was contributed as grant aid.
- To keep pace with ongoing globalization in the telecommunications sector, in March 1999 MPT simplified its system for certifying conformity with technical regulations regarding radio equipment, such as cellular telephones.

8. Promoting use of the post office network

- From February to March 1999, an experiment was conducted in Sapporo with the aim of improving the One-Stop Administration Services that use the post office network to give people easier access to a range of government services. From March 1999, another round of experiments began in 12 more cities and towns around Japan.
- As part of an "open network" scheme for Postal Savings, ATM cash dispensers at post offices had online connection with 386 financial institutions as of 31 March 1999.
- Postal savings accounts were included in the debit card service that began in Japan from January 1999, allowing users to make direct payments from their bank accounts without the need for cash. As of 31 March 1999, the Japan Debit Card Promotion Association had a membership of 923 financial institutions, as well as the branches of 104 retailers and other firms across Japan.

9. Informatization of postal administrative work

- In April 1998, MPT formulated a five-year plan detailing measures to increase the use of information technology in its administrative work between fiscal 1998 and fiscal 2002.
- In fiscal 1998, MPT began accepting official applications and notifications through the information network. By the end of the year, of 319 application or notification procedures under MPT's jurisdiction, 219 (68.7%) were accepted online.

10. Other policy measures

- MPT has promoted various measures to use info-communications to help preserve the global environment. In May 1998, the Telecommunications Council estimated that emissions of carbon dioxide in Japan could be cut significantly through the reduction of commuter traffic and more efficient use of transport brought about by the use of teleworking and ITS.
- Heavy rains and flooding in parts of Japan during fiscal 1998 caused substantial damage to terrestrial telecommunications networks. Based on the lessons learned from this experience, in March 1999 the Regional Bureaus of Telecommunications and other regional MPT offices were equipped with stocks of satellite mobile telephones that can be rented out free-of-charge during emergencies when wired networks might be down.