

## I-2-1 Current status

### A rapidly expanding market of the Internet business

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Growing Internet business

Within just a few years, the Internet has become popular at an explosive rate, and the Internet business has expanded rapidly as well.

Here, the "Internet business" means "business carrying out commercial transactions over a computer network that uses the TCP/IP (Transmission Control Protocol/Internet Protocol), and operations related to the construction of or commercial transactions involving such a network."

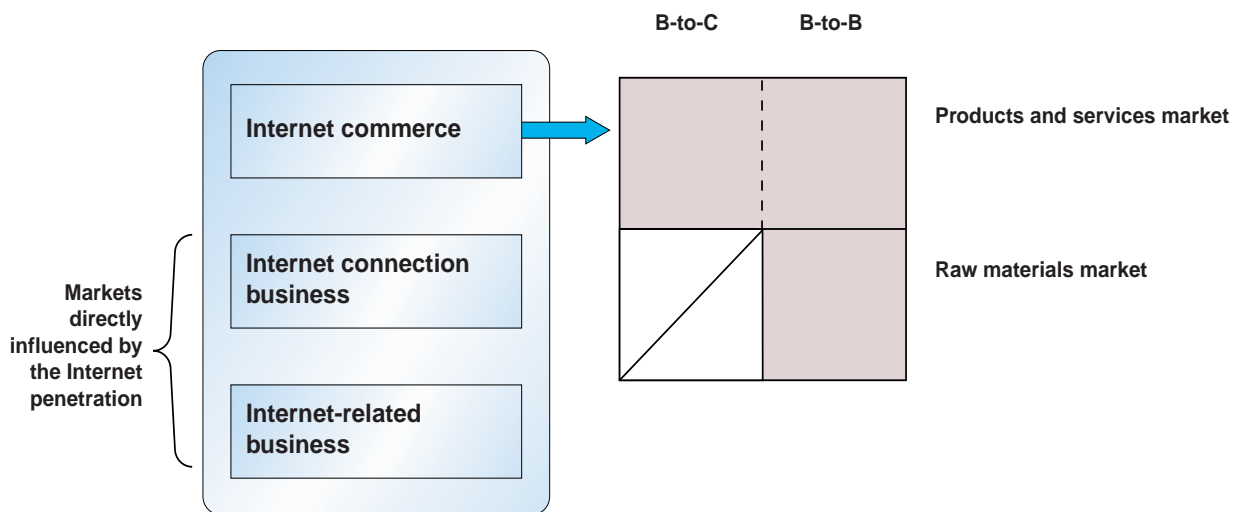
As for the Internet business, this can roughly be divided into "Internet Commerce," "Internet connection business" or "Internet-related business."

First, "Internet Commerce" can be classified as those involving the ordering and provision of goods or services as a commercial transaction over a computer network using the TCP/IP. There are the Business-to-Consumer (B-to-C) market and the Business-to-Business (B-to-B) market. Also, when breaking down the transactions, the distinction be-

tween the final products and services transactions (henceforth the "products and services market" (Refer to Endnote 3)) and the B-to-B raw materials market (henceforth the "raw materials market") can be made. According to the "Internet Commerce Survey" conducted by MPT in 1998, the B-to-C and B-to-B final products market scale during 1998 was 166.5 billion yen, double the previous year's amount (Refer to I-2-2). The raw materials market for procurement by businesses, it was estimated to be worth at least 2,431.4 billion yen (Refer to I-2-3).

For businesses being directly influenced by the Internet penetration, there are the "Internet connection business" and the other "Internet-related business," but these two are estimated to have respectively grown in 1998 to a scale worth 296.1 billion yen (2.6 times the previous year's level) (Refer to I-2-4) and 3,693.9 billion yen (1.4 times the previous year's level) (Refer to I-2-5).

Fig. Scope of Internet business



## I-2-2 The Internet commerce products and services market

### (1) Market size

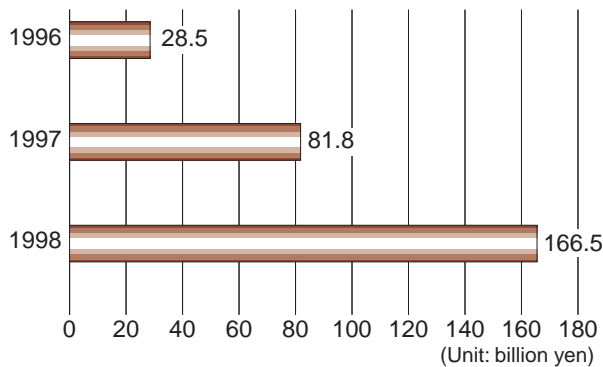
I-2

The size of the Internet commerce products and services market has grown to twice the size.

The Internet commerce products and services market doubled in 1998 to reach 166.5 billion yen, according to the "Internet Commerce Survey," thus showing how well this market is expanding (Fig. 1). In addition, the Nomura Research Institute Cy-

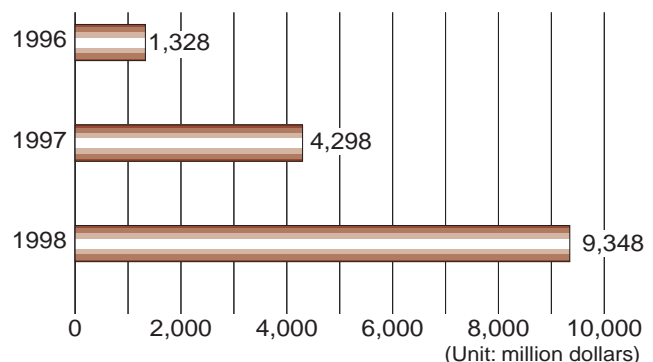
ber Business Case Bank reported that there were 13,474 businesses operating in this field at the end of December 1998, a growth of some 80% from the previous year (Refer to Endnote 4) (Fig. 2).

Fig. 1 Size of Internet commerce products and services market



Source: "Internet Commerce Survey," MPT

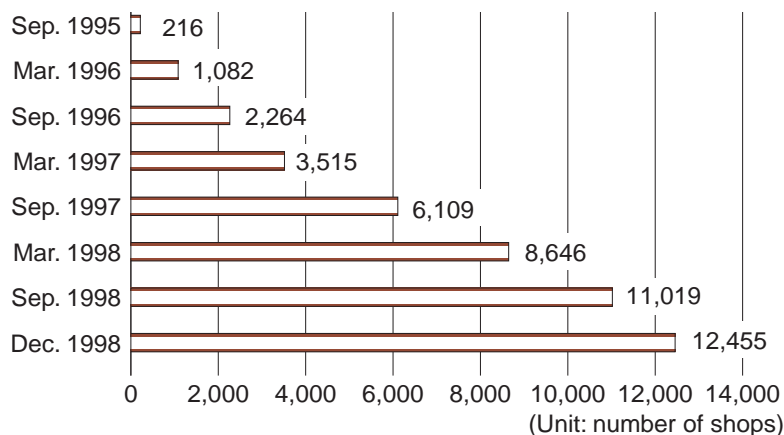
(Reference) Market size of B-to-C Internet commerce in the U.S.



Note: Figures for 1998 are estimates.

Source: IDC Inc.

Fig. 2 Number of stores operating in the Internet commerce products and services market



Note: Stores without data on date of establishment are excluded.

Sources: NRI Cyber Business Case Bank (<http://www.ccci.or.jp/cbcb/>); Center for Cyber Communities Initiative (March 19, 1999)

# Column 2 The Internet -- a “network of networks”

## A distributed management network that links computers worldwide

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Growing Internet business

The Internet is a “network of networks” that interconnects all the existing computer networks worldwide. It is unique in being, an open network that anyone can join or leave, and a distributed management network linking independent computers and networks run by administrators, and a global network without regards to geographical distance and boundaries.

Before its advent, computer networks were in a closed environment operated and managed by specific administrators, requiring permission or need to submit to monitoring upon network connection. In contrast, as a distributed management network the Internet allows various interconnections to be made without affecting individual computer operations, thus dispensing

with the need to have someone manage the entire system as one entity. As a result, while it allows users to operate and maintain things by themselves as its feature, it also allows for relatively easy Internet connections. Moreover, the Internet is global on scale and can interchange information with computers worldwide.

In addition to such technical features, the users can gain other merits, such as being able to join or leave networks at low cost and the ability for individuals to send and receive information on a global scale. The Internet is having a major effect on economic activities through providing direct contact between businesses and computers.

Fig. 1 Outline of ordinary intracompany network

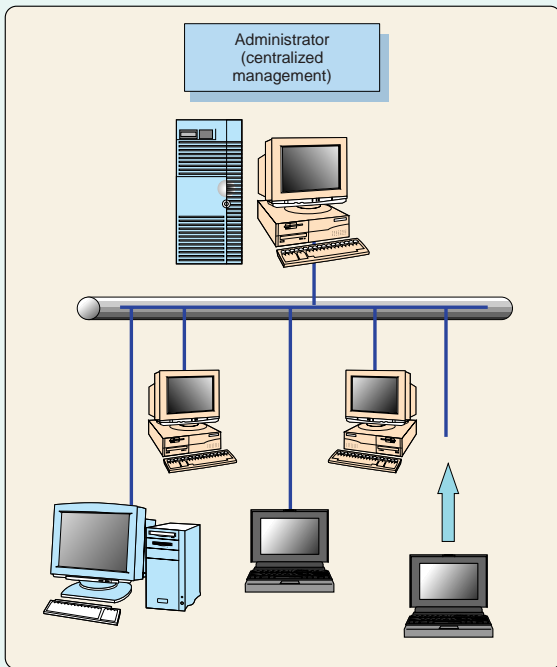
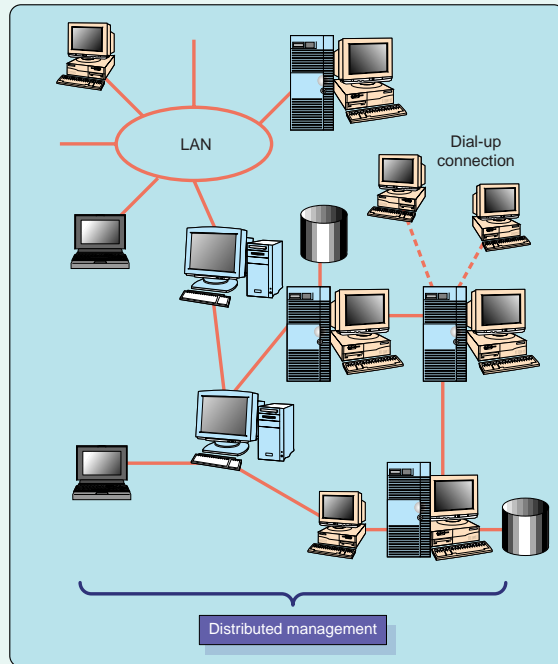


Fig. 2 Outline of the Internet



## (2) Business trends

### Polarization into many small businesses and a few big companies in terms of sales

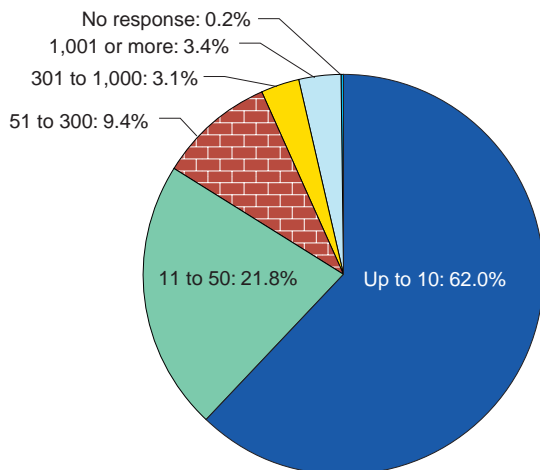
According to the “Internet Commerce Survey,” 60% of Japan-based companies offering Internet commerce products and services had no more than 10 employees, showing that many of those entering this market are small firms (Fig. 1).

Over half the companies surveyed (51.5%) said only one member of staff was engaged in managing the site, and 40.1% answered that between two and five people were employed in that work, thus showing that most were relatively small-scale management forces running the Internet business (Fig.

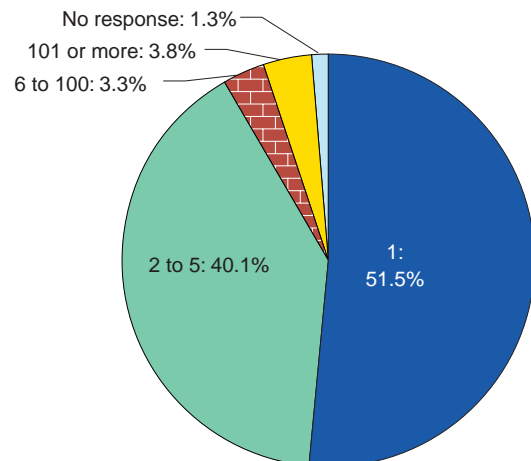
2).

Over 50% of the respondents to the survey said their total monthly sales were worth less than 100,000 yen. At the other end of the scale, 5.6% said they had sales of between 1,000,000 and 5,000,000 yen and 5.7% responded that they sold over 5,000,000 yen’s worth (Fig. 3). These figures show how the products and services market involving Internet commerce is polarized between many businesses with that are small in terms of sales and a few firms that have huge sales.

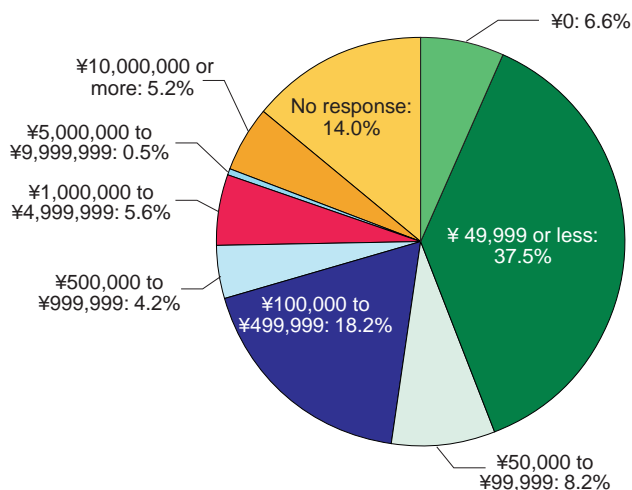
**Fig. 1** Number of employees of businesses operating in the Internet commerce in products and services field



**Fig. 2** Number of staff engaged in operating each company’s website



**Fig. 3** Average monthly revenues in the Internet commerce products and services

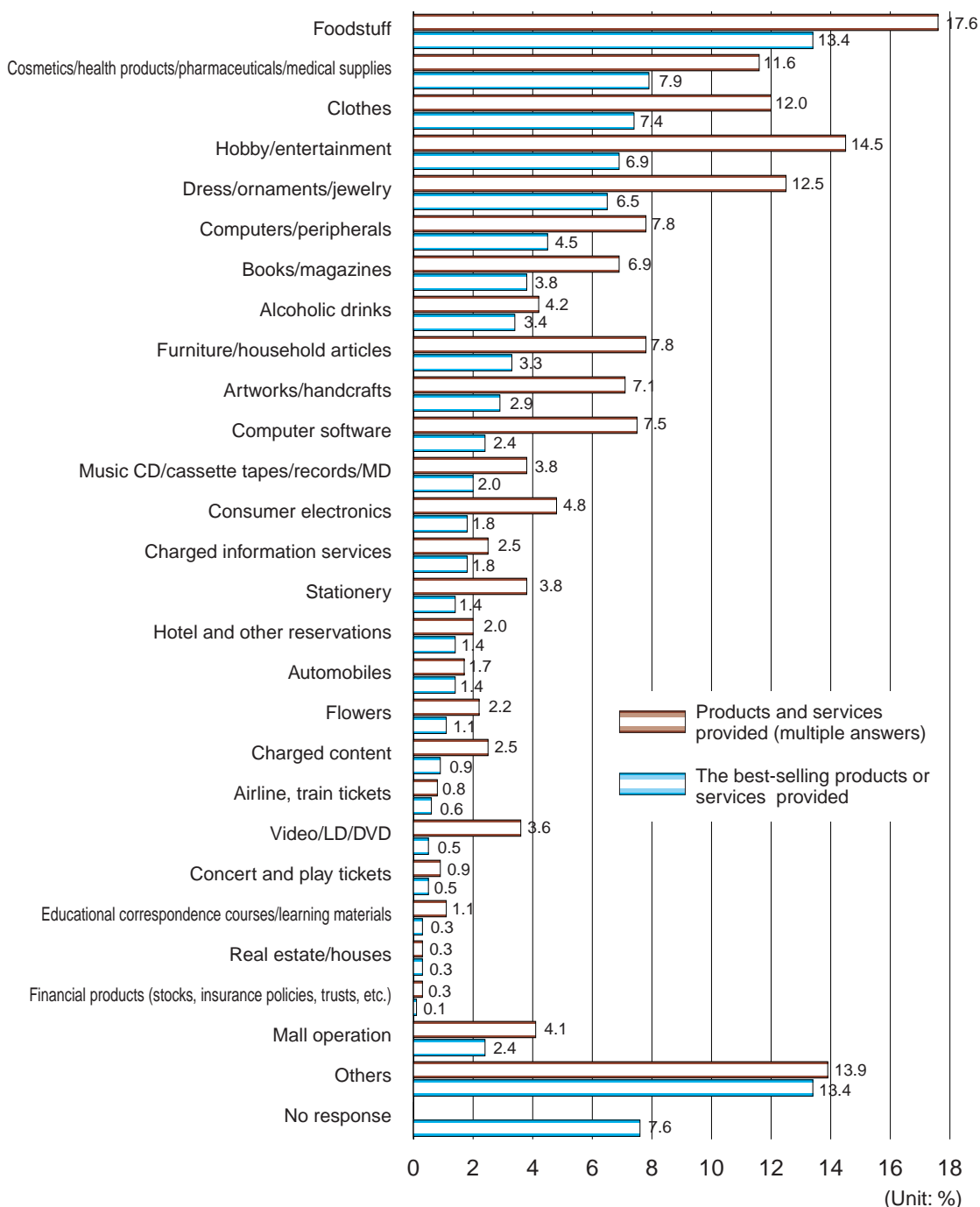


Source: “Internet Commerce Survey,” MPT.

Concerning the products and services market involving Internet commerce comprised goods and services such as food products, the most frequently answered item, and other items centered on mail order-type goods. On the other hand, goods and

services such as charged information and content download sales or various ticket reservations-type distribution business were limited, with the shops handling such items totaling sales of about 5% of the total on the market (Fig. 4).

**Fig. 4 Goods and services handled in the products and services market**



Notes: 1. Paid-for information services include: online magazines, electronic newspapers, database services, etc.

2. Paid-for content includes: music, images, video programs, etc.

Source: "Internet Commerce Survey," MPT

### (3) Problems and challenges

#### Profitability is improving, but technical problems remain.

According to the "Internet Commerce Survey," concerning the situation of the store (site) in the products and services field for the recent year, 5% more businesses reported profits on Internet commerce in 1998 compared with 1997, while 5.7% fewer businesses reported losses. Thus, the profitability of Internet commerce appears to be rising, even though one in four companies said they had not started with the aim of making a profit (Fig. 1).

As for technical problems, there was a change from 1997 when the most numerous concern was "there is no convenient and reliable account settlement method," the percentage raising this issue for 1998 having fallen by 8.0%, while the most frequent

concern now was "circuit speed is slow" at 30.2%. Other concerns were by order "cannot deal sufficiently with new technologies" (an increase by 11.3% over the previous year), "cannot manage data sufficiently such as the number of accesses," and "cannot deal adequately with technical troubles" (up 5.0% over the previous year).

As management problems, such items as "site's popularity is low" and "number of accesses has not grown as expected" related to marketing are becoming prominent, while problems such as operational costs and other operational burdens have become less so.

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Fig. 1 Profitability of Internet commerce in 1998

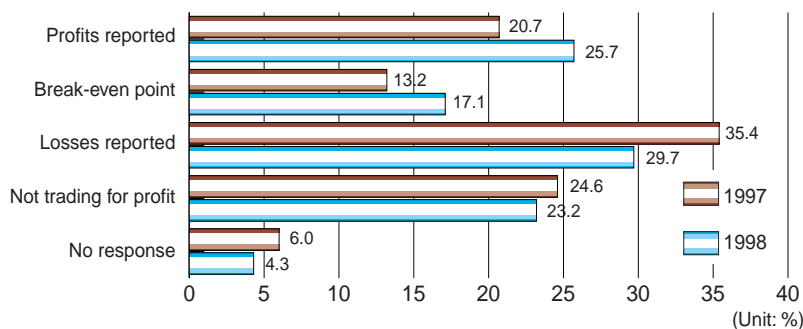
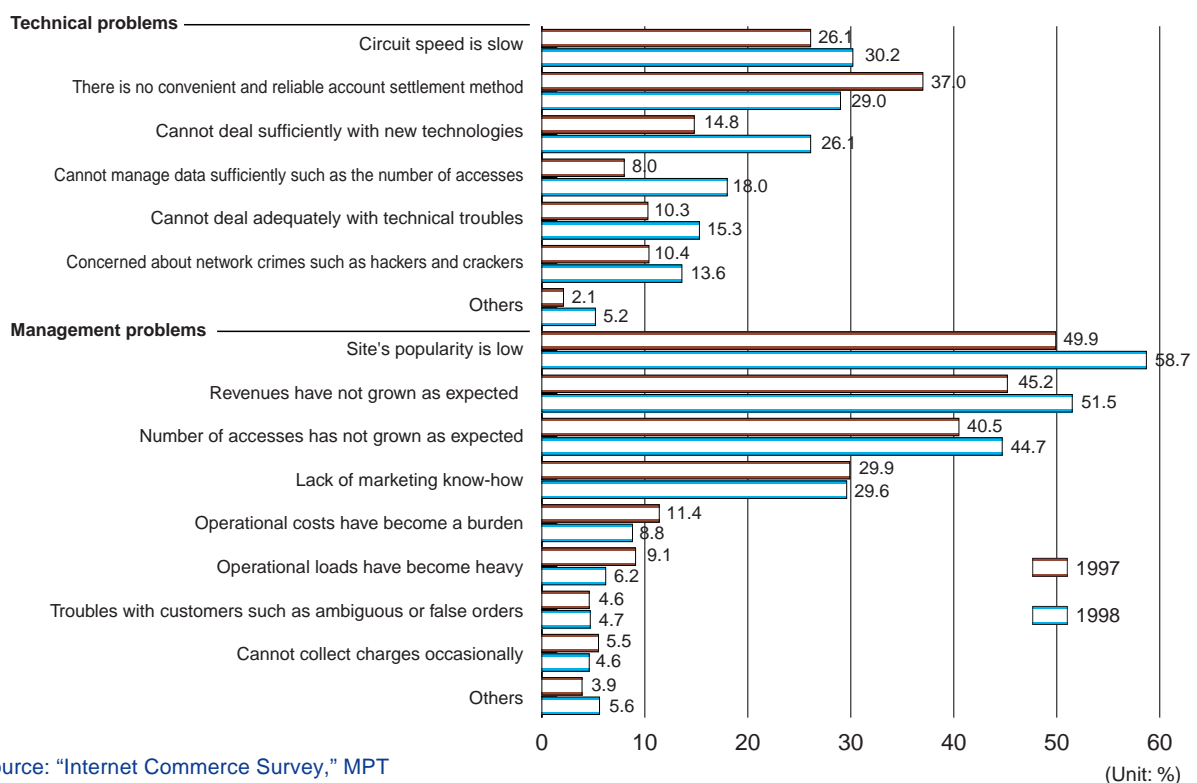


Fig. 2 Issues in the products and services field



Source: "Internet Commerce Survey," MPT

## (4) Maintenance, Repair and Operation (MRO)

### Support service for procurement of office equipment and supplies

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In the products and services field, currently the Maintenance, Repair and Operation (MRO) area is growing rapidly in the business-use Internet commerce area. MRO is the procurement by a business of products and services as expenses and indirect costs. Specifically, these are items that do not become intermediate input, such as stationery, publications, computer-related goods and office furniture. It is said that in the U.S., MRO was successful earlier than B-to-C sales to general consumers.

#### 1. Instill Corp. (U.S.)

The E-Store run in the U.S. by Instill Corp. is a successful example of MRO. This service is an Internet-based food and beverage facilities specializing in restaurants, hotels, businesses, schools, hospitals and the like. In 1997, Instill had sales of over 180 million dollars. The company mainly acts as an intermediary for accepting orders from restaurants and such through the E-Store homepage by supplying the latest product catalog information from numerous food-related distribution companies. This enables restaurants and the like to have a much wider choice of firms from which to obtain the deliveries, and the E-Store provides data on a variety of prices and products through one-stop shopping, making procurement more efficient and less costly. For suppliers offering the products, Instill allows for simplified marketing while expanding their customer base in addition to making the order-receipt time shorter through paperless and other methods. Thus, both can benefit from increased efficiency.

#### 2. Askul Co., Ltd.

Examples of MRO in Japan include firms selling office supplies, such as Askul Co., Ltd. Conventionally, the general affairs division of a company finds out what the other divisions require in office

supplies and orders these centrally. However, in the case of the Internet sales of Askul, the ordering is made easy since the necessary item(s) can be selected each time with the click of the button on the Askul homepage, with the delivery being sent out the following day. This dispenses with the need to have some division canvass the amount of office supplies required and make calculations upon ordering, thereby making the ordering process much simpler. Today, Askul's Internet sales account for about a tenth of the total sales, at about 180 million yen per month.

#### 3. Business Co-op, Inc.

The Business Co-op, Inc. (BCoop) also offers a type of MRO as its mainstay operation. Big firms can usually get bulk discounts for the large amounts of office supplies they procure. However, this is not the case for small- and medium-sized enterprises (SMEs), making it fairly expensive in most cases to obtain such supply due to the lack of market-scale merit. BCoop noticed this point and is operating a business that procures office supplies and such items jointly upon gathering orders from numerous SMEs, with the incoming and outgoing orders being handled over the Internet. This is done through a homepage that is accessible only by member companies, which displays the latest products and prices and accepts orders at any time.

As can be seen, businesses offering MRO are not simply engaged in Internet commerce to some degree; they also use the characteristics of the Internet to the homepage act as the "link" with client firms. Thus, these businesses act either as "outsources" of some portions of the clientele firms' operations or as "efficiency improvement agents" thereof by offering value-added services that bring down the costs involved for clientele firms.

## I-2-3 Business-to-Business (B-to-B) market

### (1) Market size

**The Japanese market for online procurement of raw materials is worth at least 2.4314 trillion yen.**

Product sales by businesses over the Internet have been steadily growing over the past several years. In 1998, the online procurement of raw materials and such over the Internet between businesses grew drastically. Furthermore, with the total costs for such B-to-B dealings being huge, commercial transactions using Internet technology have become very sizable. The April 1998 report "The Emerging Digital Economy" from the U.S. Department of Commerce noted that in the U.S., Internet commerce is growing fastest among businesses; the situation in Japan is similar.

The "Internet Commerce Survey" asked major companies in each related field as well as those handling raw materials who were found on the pages of newspapers and magazines over the past two years as to whether they handled raw materials on the Internet and if so what in what amounts. As a result, it is estimated the Japanese market for online procurement of raw materials is worth at least 2.4314 trillion yen (Table).

By category, almost all buying raw materials in Japan over the Internet are manufacturers. This method of such procurement is especially used by the automobile, electrical machinery and machinery industries, which have strong "keiretsu" relations with raw materials suppliers within their busi-

ness groups, making it easier to implement a unified system for ordering through use of the Internet technology.

Although such raw materials transactions constitute a sizable portion of the entire Internet business, considering Japan's industrial scale, there is much room for expansion. According to the survey, many companies that now use the Internet just to exchange information or conduct business discussions have not yet used the Internet to make procurements. Some of these companies reported that although they were able to conduct such transactions, their counterparts were not yet ready to do so. Eventually, as these links are formed, the market is likely to grow considerably.

In Japan, the raw materials procurement system commonly uses the Extranet, a type of Internet use which restricts use to those who are registered. This could be the result of the priority that Japanese companies place on security. In addition, because there are many "keiretsu" dealings within business groups, there is little demand for use of public switched networks. In comparison, the open environment in the U.S. enables companies that have not dealt with each other before to provide estimates and proposals in attempts to gain new contracts.

**Table Raw materials transactions on the Internet by industry**

(Unit: billion yen)

Industry	Market size
Automobile	1,980.0
Electrical machinery	303.4
Machinery	91.0
Trade	32.0
Others	25.0
Total	2,431.4

Source: "Internet Commerce Survey," MPT

Related site: Emerging Digital Economy (<http://www.ecommerce.gov/emerging.htm>)



## (2) Raw materials procurement

Online procurement has also speeded up manufacturing and sales.

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There have been an increase in businesses that introduce the raw materials procurement system to improve the operational efficiency or speed up the manufacturing cycles.

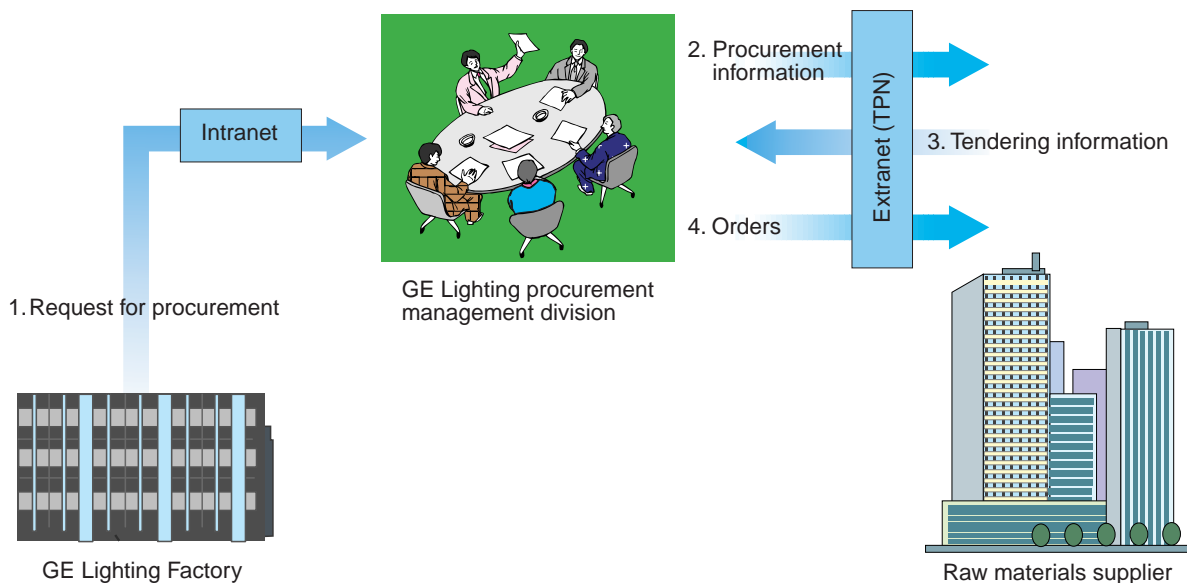
General Electric Co. (GE) of the U.S. has implemented a Trading Process Network (TPN) at its group company, GE Lighting, on a trial basis. GE Lighting has 45 factories around the world, every day its headquarters receives several hundred requests for parts to be ordered from suppliers. Before TPN, over two million blueprints had to be checked for matching specifications and took at least seven days just to get the information for parts procurement to be sent out. It was not unusual for three weeks to pass before a decision was made on which supplier to use. Since the introduction of TPN, however, the requests from various sections came in over the system, where it was also possible to obtain procurement information and transmit blueprints. The system now provides the potential suppliers with procurement information within two hours and enables the bidding to take place within seven days (Figure).

According to "The Emerging Digital Economy" from the U.S. Department of Commerce, with the introduction of TPN system, GE Lighting was able

to reduce the number of staff engaged in raw materials procurement by 60% and cut personnel costs by 30%, while shortening the procurement time by half from 18 - 23 days before to 9 - 11 days. Also, as the system allowed more suppliers to be easily contacted, procurement at favorable prices became possible, thereby cutting raw materials procurement costs by 5 - 20%. TPN is now being provided other companies as an inter-company raw materials procurement system.

Some Japanese companies are using the TCP/IP for their procurement system. At Asahi Breweries, the Extranet was implemented for raw materials procurement from the autumn of 1997. This Extranet was connected for use with can/bottle production, wrapping materials and printing companies for interactive handling of data giving and/or receiving orders. Asahi Breweries is also building an information network for use throughout the company by sections such as production, logistics and sales in addition to the procurement section; the raw materials procurement system is a portion of this comprehensive system. Through use of the comprehensive system for realization of maximized efficiency, the company aims to cut the delivery time of "Asahi Beer" products down to a minimum.

Fig. Procurement system of GE Lighting



Related site: GE Lighting (<http://www.ge.com/lighting/>)

### (3) Built-To-Order (BTO) sales

**Direct relationships between manufacturer and consumer can improve efficiency.**

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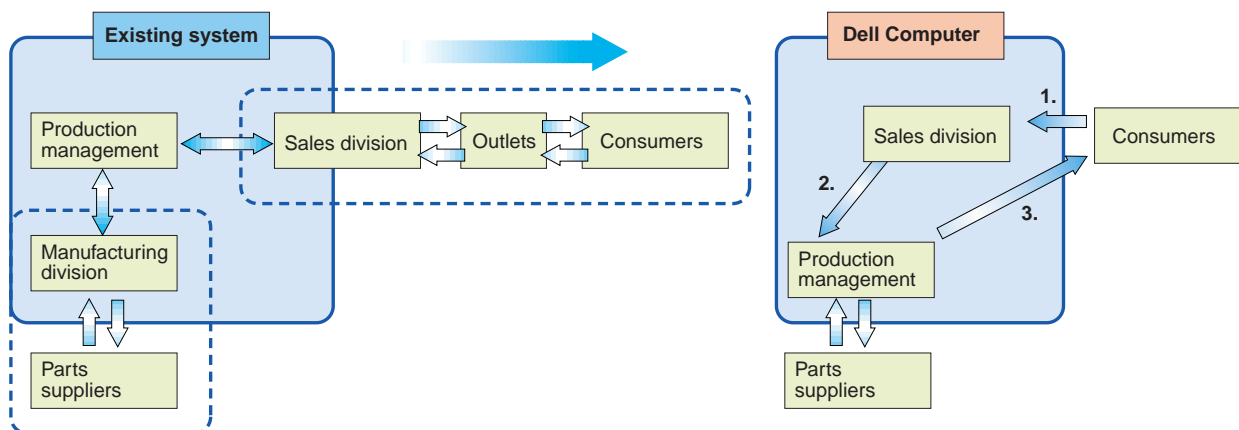
Internet commerce allows direct sales of products by the manufacturer, without the need for a physical retailer. Such direct sales not only eliminate intermediate costs; they also facilitate the Built-To-Order (BTO) production method. This has an advantage for the consumer in that a product can be made to match his or her individual needs at a reasonable cost. At the same time, manufacturers have the advantage of reduced inventories and lower costs of maintaining stock. Both sides benefit from the BTO system being able to supply the latest products.

A successful example of use of online direct sales and the BTO is Dell Computer Corporation of the U.S. Focusing on the direct sales earlier than several competitors, the company has used BTO since it was founded in 1984. It also began using the Internet commerce system to BTO in 1996. These methods allowed Dell to price its products some 10 to 15% cheaper than its competitors. In January 1997, for the first time, it made online sales of over

a million dollars a day. In the final quarter of fiscal 1998, it made the average of 14 million dollars per day. The company had total sales of about 18.2 billion dollars during the February 1998 to January 1999 period, of which about a quarter were via the Internet; the company hopes to eventually generate half of its sales in this form. Moreover, of the individual consumers who ordered via the Internet, nearly 30% said they had never seen the company's advertisements in other media, indicating the power of the Internet in reaching new markets.

Among Japanese firms, some personal computer manufacturers have been active in using direct online sales and the BTO system, and this trend is growing. However, because of the close links between companies in Japan's "keiretsu" groups, many firms find it difficult to switch from the existing sales networks to direct sales. Japan's corporate culture still needs to make adjustments to make full use of Internet commerce.

**Fig. Direct sales method by Dell Computer Corp.**



Related site: Dell Computer Corp. (<http://www.dell.com/>)

# Column 3 Contents by domain and file, overseas links

“**.co domain**” comprises 41.5%, HTML file comprises 50.7% and overseas links 4.6% of the total.

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Growing Internet business

According to “WWW Content Survey,” as of February 1999, Second-Level Domain (SLD) WWW servers with Top-Level Domain (TLD) “.jp” were divided 41.5% for “.co” (the largest number), followed by 32.2% for “.ac” and 11.1% for “.or,” showing that the domains for “.co” and “.ac” had switched places in terms of ranking (Fig. 1; as for types of domain names, refer

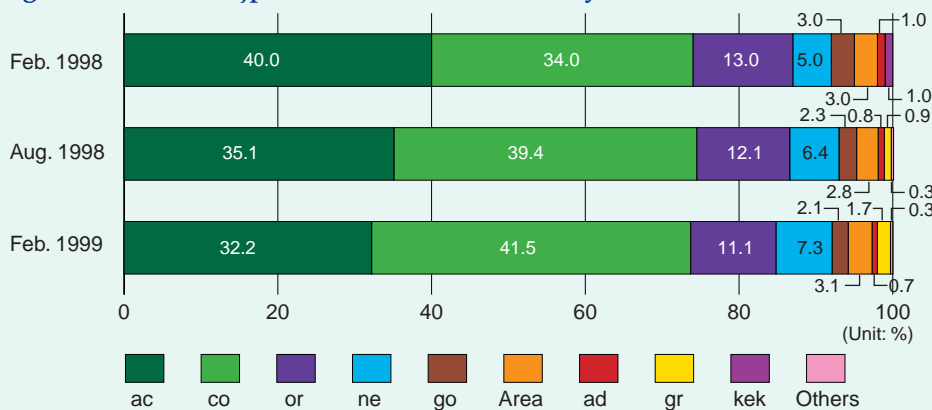
to Appendix 5).

Also, looking at the total files that can be accessed via the WWW in Japan, 50.7% were HTML files and 46.8% were image files, with the two combining to constitute 97.5% of the total. Moving picture and audio files are still very limited in number. However, looking at the total amount of information in files that can be accessed by WWW,

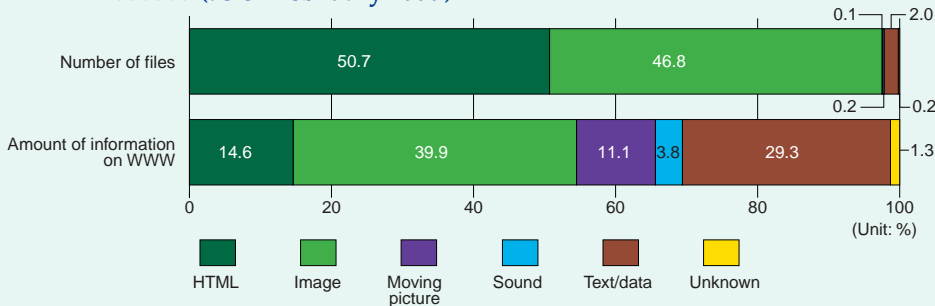
only 14.6% was included in HTML files, while text and data files (including PDF files) added up to 29.3% and moving picture and audio files took up 14.9% (Fig. 2; Refer to I-Introduction-2).

Regarding the link sites for Japanese files on WWW (HTML files), some 95.4% were linked to “.jp domain” files, illustrating that most links were domestic. Although there were 4.6% links to sites abroad, a breakdown by region shows that 82.7% were in North America, followed by 12.5% in Europe and only 2.3% of the total links in Asia, indicating that most links were with Western countries (Fig. 3).

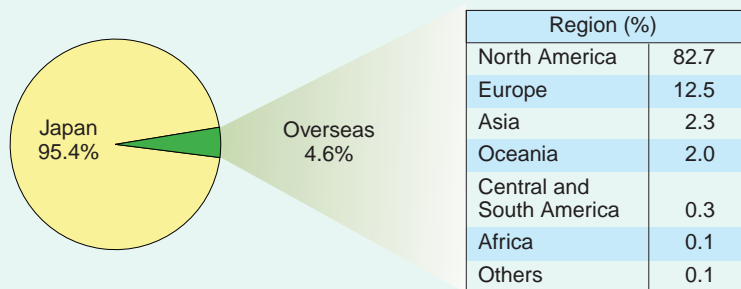
**Fig. 1** Number of “.jp” domain WWW servers by SLD



**Fig. 2** Number of files and amount of information on WWW (as of February 1999)



**Fig. 3** Linked HTML files by region (as of February 1999)



Source: “WWW Content Survey,” Institute for Posts and Telecommunications Policy, MPT

Related site: Institute for Posts and Telecommunications Policy (<http://www.iptp.go.jp>)

## I-2-4 Internet connection business

### (1) Internet service providers (ISPs)

**Monthly average price of Internet connection service is about 1,900 yen for 15 hours' use.**

According to MPT's "ISP Survey," the market size for the Internet connection business handled by Japanese Internet service providers (ISPs) in 1998 was estimated at 295.5 billion yen.

#### 1. Characteristics of ISPs

Of the ISPs surveyed, only 27.2% said Internet connection business was their mainstay operation — the rest having other mainstays (Fig. 1). Concerning the number of access points, 38.5% of the ISPs said they have only one point (Fig. 2), while 87.3% said they have several points around Japan to offer a regional service (Fig. 3).

#### 2. Status of Internet connection business

Nearly 70% of the ISPs replied that sales from Internet connection business had increased from the

previous year (Fig. 4), while over 70% replied that the number of subscribers had also risen (Fig. 5). Regarding finances, ISPs with accumulated deficits accounted for 61.0% (Fig. 6), but those in the red only in 1998 totaled 44.1% (Fig. 7). These figures suggest that the business is becoming more profitable along with the increase in revenues and subscribers.

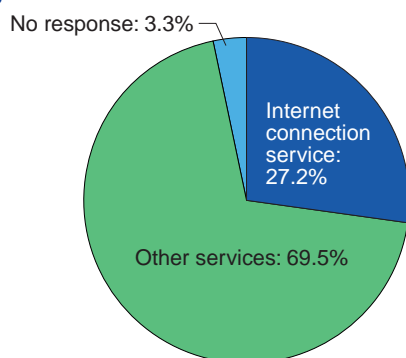
#### 3. Charges for Internet connection services

A look at the price per month of Internet connection services shows that the lowest charges for 15 hours and 50 hours of use (excluding communications costs) catering to individual users hovered around the 1,000- to 3,000-yen range. The average price was 1,884 yen per month for 15 hours, 2,602 yen per month for 50 hours (Figs. 8 and 9).

**Table Number of ISPs**

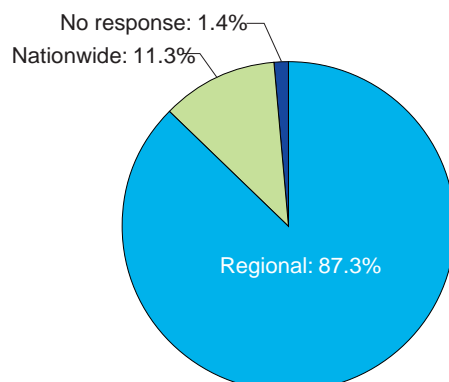
	Aug. 95	Feb. 96	Aug. 96	Feb. 97	Aug. 97	Feb. 98	Aug. 98	Feb. 99
Type I telecommunications carrier	1	1	2	5	9	15	34	49
Special Type II telecommunications carriers	8	20	25	31	37	40	42	36
General Type II telecommunications carriers	69	385	1,101	1,609	2,135	2,521	2,978	3,235
Total	78	406	1,128	1,645	2,181	2,576	3,054	3,320

**Fig. 1 Carriers' main business**

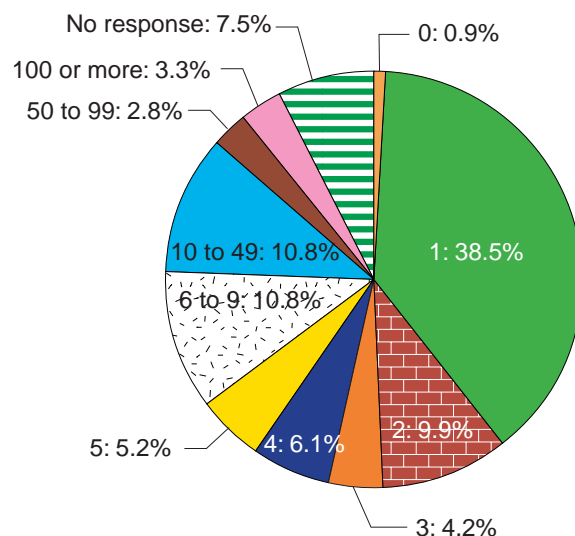


Source: MPT

**Fig. 3 Service area**

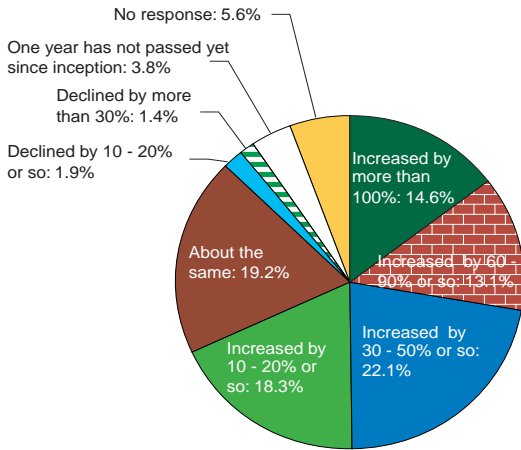


**Fig. 2 Number of access points**

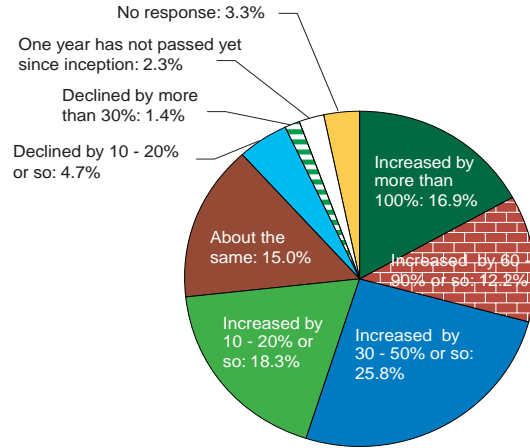


Source: Figs. 1 to 3 are based on "ISP Survey" of MPT.

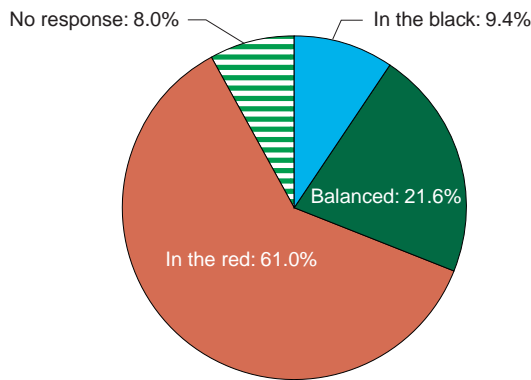
**Fig. 4 Revenues growth over the previous year**



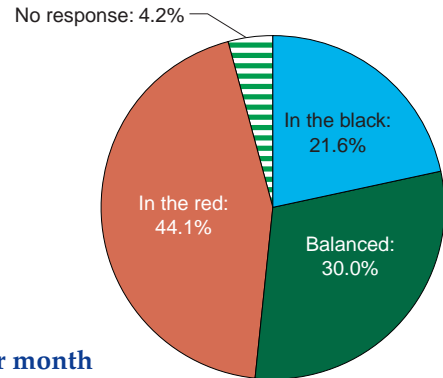
**Fig. 5 Growth of the number of subscribers over the previous year**



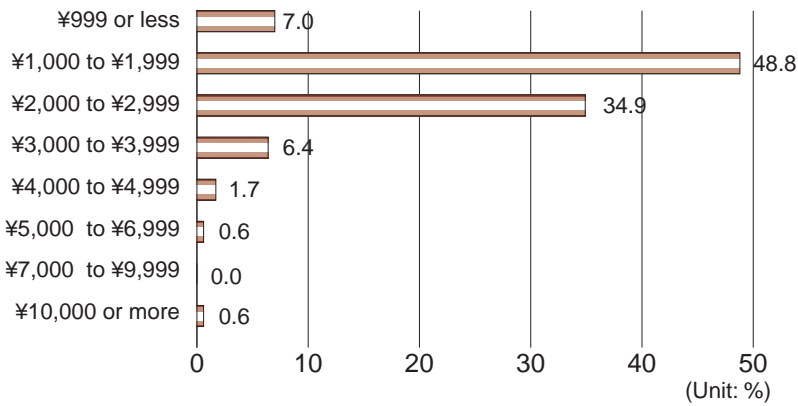
**Fig. 6 Balance sheet (accumulated figures)**



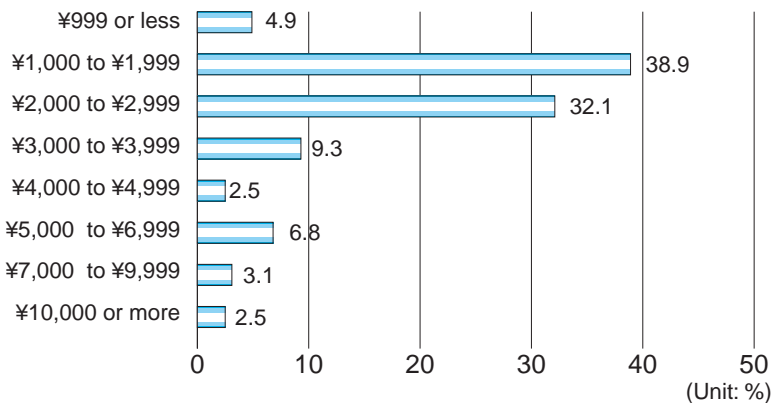
**Fig. 7 Balanced sheet (single year)**



**Fig. 8 Internet connection service charges for 15-hour use per month**



**Fig. 9 Internet connection service charges for 50-hour use per month**



Source: "ISP Survey," MPT

## (2) Internet connection services via cable TV

### 21,000 subscribers for Internet connection services provided by cable TV operators

Cable TV operators have been increasingly entering that business of providing Internet connection services. Such services over cable TV lines enable higher speeds (several hundred kbps to several Mbps, compared with conventional telephone lines at several ten kbps).

#### 1. Market size for Internet connection business

According to the "Cable TV Operators Survey," the market size for Internet connection business by those cable TV operators actually providing the services (28 operators as of November 1998) was estimated at 590 million yen for 1998.

The 21,000 subscribers to Internet connection services offered by cable TV operators are equivalent to approximately 2% of the 909,000 subscribers to broadcasting services from the same cable TV operators (although the coverage areas for the two types of services may differ.) (Table).

#### 2. Status of Internet connection business

Of the 28 cable TV operators offering Internet connection services, 24 had been in the business for less than one year as of November 1998 (Fig. 1). The average number of employees involved in this business was 8.4 people per company (Fig. 2).

#### 3. Charges for Internet connection services

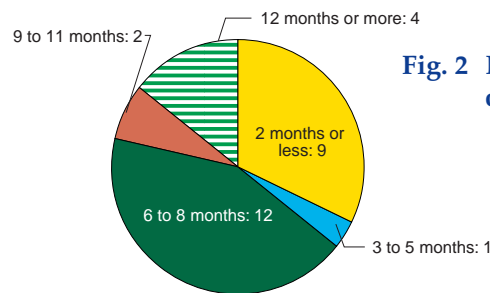
A look at the monthly charge for Internet connection services shows that the lowest charges for 15 hours and 50 hours of use (for those services offering a per-hour option) catering to individual users hovered around 5,000 yen (Figs. 4 and 5).

Since 20 of the 28 operators offer a fixed monthly rate, there is little price differential according to the number of hours used. The average charge for the 20 operators was 4,923 yen per month.

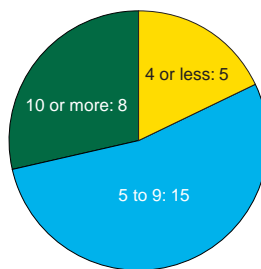
**Table Internet connection services provided by cable TV operators**

Cable TV operators offering Internet connection services	Homes passed by those operators	Subscribers to broadcast services offered by those operators	Subscribers to Internet connection services offered by those operators
28	3,862,000	909,000	21,000

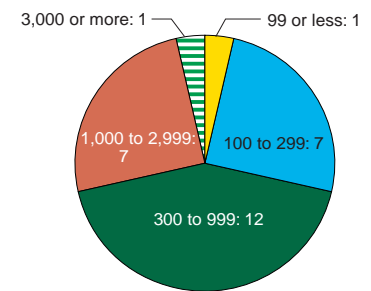
**Fig. 1 Period of Internet connection service operation in months**



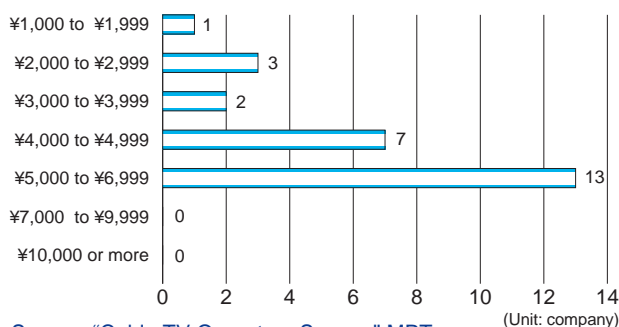
**Fig. 2 Number of employees in charge of Internet connection services**



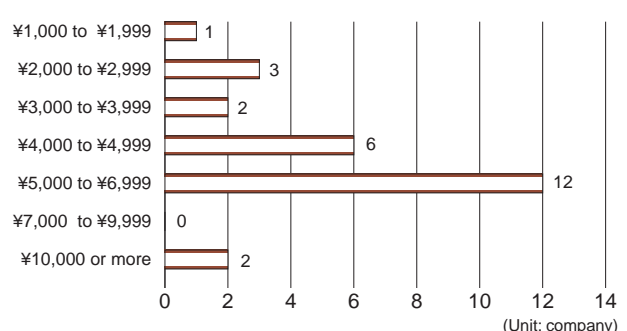
**Fig. 3 Number of subscribers to Internet connection services**



**Fig. 4 Internet connection service charges for 15-hour use per month**



**Fig. 5 Internet connection service charges for 50-hour use per month**



Source: "Cable TV Operators Survey," MPT

Related site: Configuration of Cable TV Internet ([http://www.kmn.co.jp/catv\\_guide/index.html](http://www.kmn.co.jp/catv_guide/index.html))

### (3) Internet connection services via satellite and mobile telecommunications

#### Trends for other Internet connection services operators

I-2

Recently, operators offering new types of Internet connection services have appeared, as outlined below.

##### 1. Internet connection services via satellite

Providing Internet connection via satellites enables wireless transmission of a large amount of data through satellite downlinks for the return leg of the Internet access (Internet-to-user transmissions).

To use such satellite-based Internet services, a separate ISP subscription for the initial leg of the Internet access (user-to-Internet transmissions) is required in addition to the satellite Internet services provider.

Satellite-based Internet can transmit between several hundred kbps to several Mbps of data simultaneously over a wide area within the satellite footprint.

Currently, only a few operators offer Internet services using satellites, with their services being mainly limited to corporate users. However, with the increased efficiency in satellite transponder use,

there have been moves to start up services targeting individuals, and it is thought that this will lead to an increase in the number of users.

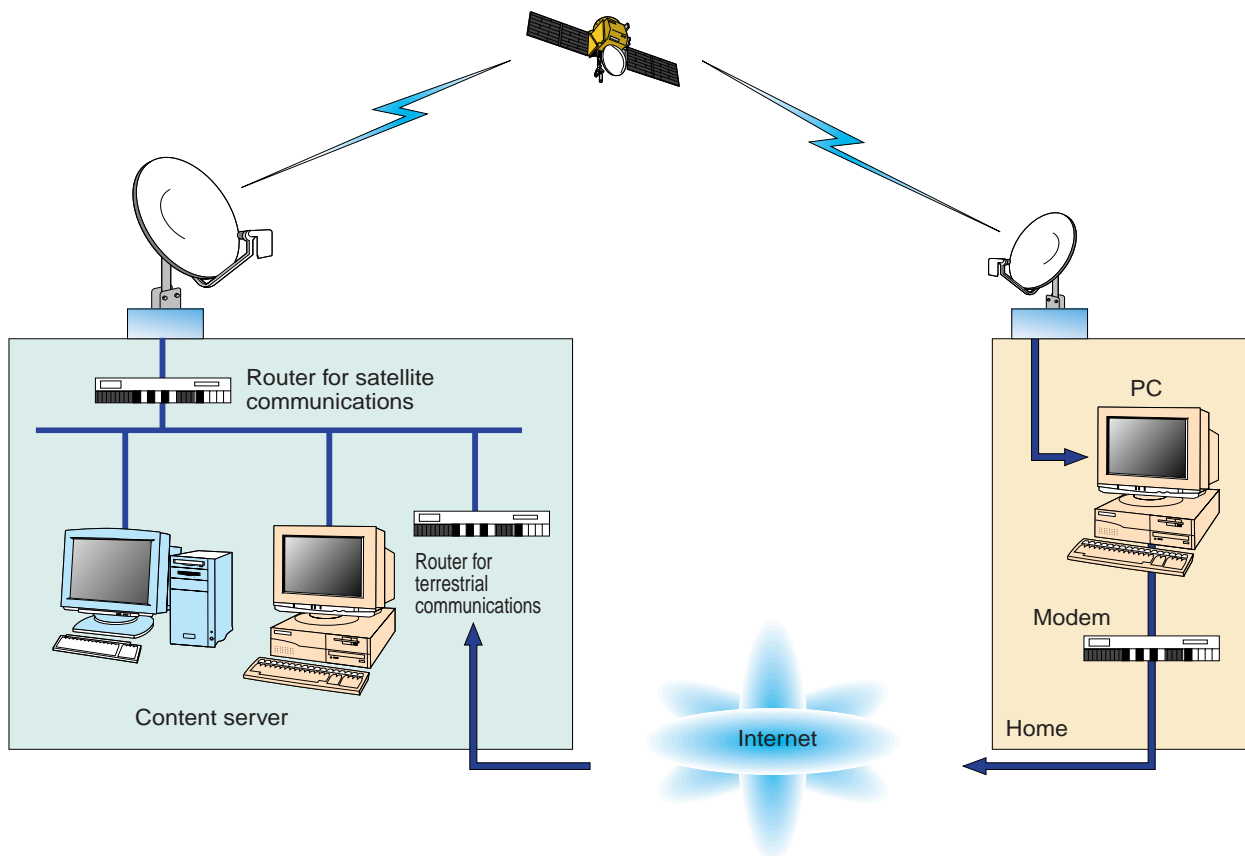
##### 2. Internet connection services by mobile communications carriers

Conventionally, Internet connection services offered by mobile communications carriers have been limited to connecting the user with a certain ISP, as a subsidiary service to the mobile communications business.

These carriers offered Internet connection services by sending the user's data to a designated phone number offered by the carrier over the switched circuit network (or packet transmissions network) to connect with an access point of a specified ISP.

However, with increased data transmission speeds and improved liquid crystal display (LCD) monitors for mobile communications terminals, higher value-added services have become possible, leading carriers to being offering direct Internet connection services from the latter half of 1998.

Fig. Satellite-based Internet



Growing Internet business

## I-2-5 Related businesses

### (1) Market size

**Internet-related business in Japan grew by 44.5% in 1998.**

Internet-related businesses refer to all areas related to the Internet apart from the Internet commerce and Internet connection services referred to in I-2-1. According to MPT's "Internet-related Business Survey" (conducted in December 1998), in 1998 the market in Japan was worth 3,693.9 billion yen, up 44.5% over the previous year.

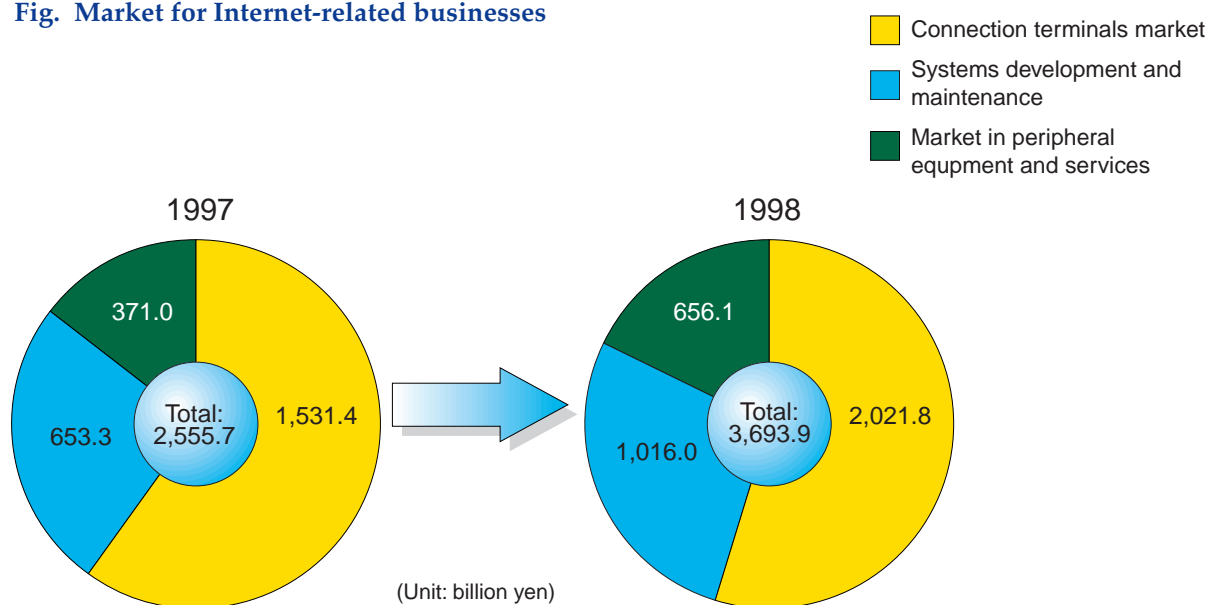
Internet-related businesses comprise:

- 1) the connection terminals market (Refer to Endnote 5), including personal computers and other equipment (Refer to I-2-5-(2));
- 2) systems development and maintenance (Refer to Endnote 6), including Internet-related software and hardware other than terminals (Refer to I-2-5-(2)); and
- 3) the market in peripheral equipment and services (Refer to Endnote 7), including transac-

tion settlement services (Refer to I-2-5-(4)), advertising (Refer to I-2-5-(6)), telecommunications for connection to ISPs, and logistical services such as delivery of items ordered via Internet commerce.

All areas of Japan's Internet-related business are growing, and this trend is expected to continue with the rising use of the Internet at work and in the home. Currently, the Internet connection terminal market is the largest of the three, at 2,021.8 billion yen in 1998, up 32.0% over the previous year. However, peripheral businesses showed the fastest growth, rising by 78.4% over the previous year. This is thought to be the result of the surge in Internet commerce, leading to greater expenditure on related advertisement, settlement, delivery and other services.

**Fig. Market for Internet-related businesses**



Sources: "Internet-related Business Survey," MPT; "1998 Advertising Expenditures on Major Internet Sites," Dentsu Inc.



## (2) Equipment

The Japanese Internet-related equipment market totaled nearly three trillion yen in 1998.

According to the "Internet-related Business Survey," the Internet connection terminal market grew to 2,021.8 billion yen in 1998, up 32.0% over the previous year (Fig. 1). The main cause of this growth is thought to be a large increase in Internet users in Japan. Meanwhile, the market size in 1998 for the Internet-related equipment other than terminals was 932.1 billion yen (Table 1), with the Internet-related equipment market amounting to 2,953.9 billion yen in 1998.

As Internet users increase, so do vary the types

Fig. 1 Internet connection terminal market

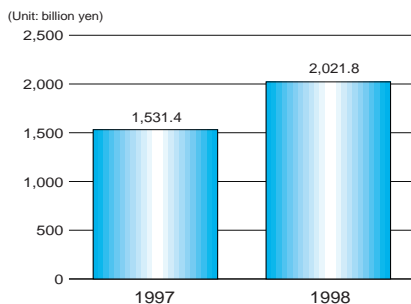


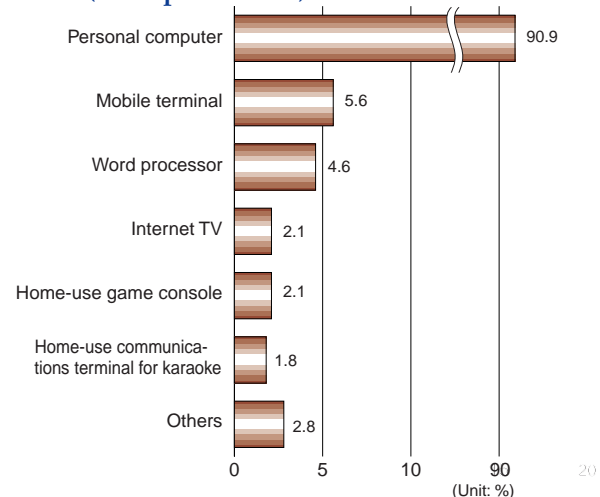
Table 1 Market of Internet-related equipment other than terminals

	1998
Mid-range computer	431.4
Workstation	136.1
LAN-related peripherals	364.7
Total	932.1

Source: Fig. 1 and Table 1 are based on "Internet-related Business Survey," MPT.

of terminals to be hooked up to the Internet. Of those terminals, personal computers account for nearly 90%, with mobile terminals, word processors, car navigation systems, telephones and other devices taking up the rest (Fig. 2 and Table 2). For instance, "Dreamcast," a home-use game console from SEGA Enterprises, Ltd., is equipped with an Internet connection function. According to SEGA, 500,000 units were shipped by the end of 1998 since its release on November 30, 1998, and more than 100,000 Dreamcast users accessed the Internet.

Fig. 2 Terminals used for Internet access (multiple choices)



Note: 285 households responded to this question.

Source: "The 1997 Communications Usage Trend Survey (Household Section)," MPT

Table 2 Major products with built-in Internet access functionality

Types of terminal	Products	Access speed	Price	Internet access charge	ISP	Value-added services
Internet TV	"WebTV," "NCTV"	56 kbps 10 Mbps (when accessed through cable TV networks)	¥45,000 to 55,000 (WebTV)	¥2,000 per month for the initial 15 hours, and beyond that it is an additional charge of ¥5 per minute (WebTV)	One can choose an ISP from a group of designated ISPs.	"WebTV Plus," a service integrating TV broadcasting and the Internet
Internet telephone	NTT's multimedia telephone "Telesse"	64 kbps (when using INS Net-64)	¥80,000	To be billed for the connection charge by an ISP	One has to sign up with an ISP.	Touch screen
Internet car navigation system	Models by Sony Corp., Pioneer Electronic Corp., Matsushita Electric Industrial Co., Ltd. and other manufacturers	9.6 kbps (when using cellular telephone)	About ¥100,000 (without the monitor) to 350,000 (with the monitor), excluding connection adapters	To be billed for the connection charge by an ISP	One has to sign up with an ISP.	Information service concerning one's travel destination, weather, entertainment, etc.
Game console	"Dreamcast" by SEGA	33.6 kbps	¥29,800	¥5 per minute, in addition to the communications charge	The ISP designated by SEGA, or an ISP of one's choosing	Online, interactive game-playing via the Internet
Mobile terminal	"i-Mode" by NTT DoCoMo	9.6 kbps	¥35,900	¥300 per month, in addition to the basic charge and communications charge	No need to sign up with an ISP	Mobile banking, ticket reservation, etc.

Source: Relevant materials

### (3) Authentication

#### Ensuring the security and reliability of electronic commerce

Because Internet commerce enables financial transactions without the need for face-to-face communication between parties, concerns have mounted over its security and reliability. There is strong demand for the implementation of methods that authenticate the identity of the person at the other end of the line, and that protect communications and electronic files from being intercepted or altered in transmission. Authentication is a key method for achieving these aims.

Authentication has become possible through the invention of several encryption technologies. Of these, the “public-key cryptosystem” (Refer to I-Column-4) is now used mainly. The following is an example of how the system is used to authenticate transactions between an online shop and a customer.

- 1) The shop and the customer both apply for a “public-key certificate” from a certification authority (CA).
- 2) If the CA finds the applicants’ identities authentic, it issues each with a public key certificate.
- 3) The shop and the customer attach their own

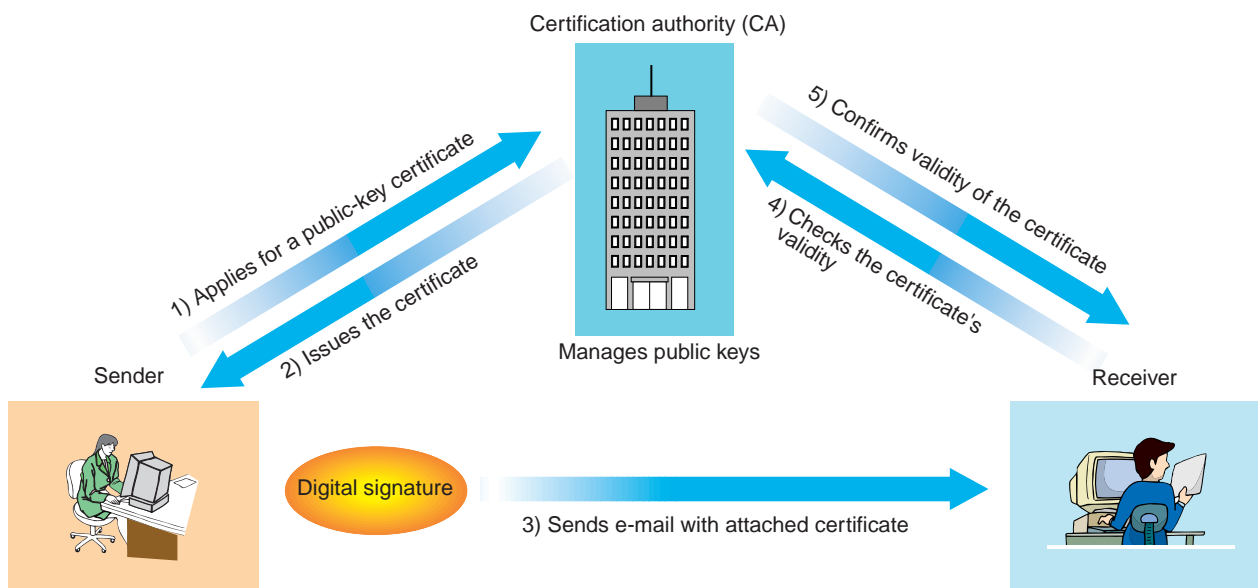
certificates to e-mail messages for conducting transactions over the Internet — from the placing of orders to delivery arrangements.

- 4), 5) Referring to the attached certificate, the party receiving a message can confirm with the CA whether the sender’s identity is authentic and the message has been received unchanged.

In an electronic authentication service, the involvement of an independent third party, such as a CA, helps to ensure a high level of security and reliability in Internet commerce.

To guarantee their fairness, CAs must meet a range of requirements, including the adoption of advanced security systems. Currently, there are four commercial CAs in Japan, and the authentication market is relatively small. However, demand for electronic authentication is expected to grow with the rise in Internet commerce. The four existing CAs were all established by large Japanese corporations from a range of major sectors, indicating that Japanese business as a whole sees a rosy future for electronic authentication services.

Fig. Electronic authentication service



Note: In some cases, credit card companies and banks handle the transactions up to user registration, and commission authentication service providers to issue public-key certificates.

## (4) Settlement of transactions

### Ways to pay for goods bought online

Internet commerce allows orders to be placed or accepted via an Internet homepage, through which payment for goods and service can also sometimes be made. The simplest method for completing online transactions is to input a credit card number. Security applications, such as Secure Sockets Layer (SSL) or Secure Electronic Transaction (SET) which use authentication (Refer to I-2-5-(3)), are often used to encrypt the information being transmitted to ensure the security of transactions.

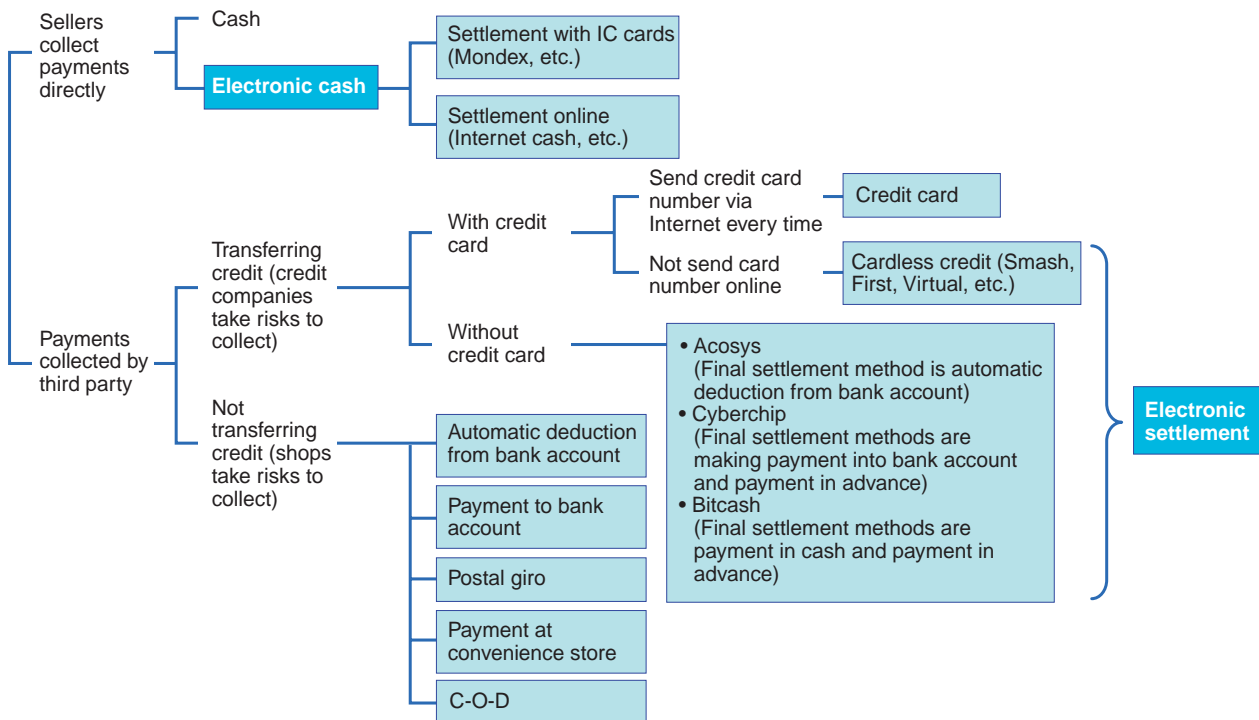
In addition, it is possible to make online payments from a credit card company or other financial institution without directly sending account numbers over the Internet. This involves the use of post, phone or facsimile to complete prior registration of the card or account number with the operators of online settlement services, who then issue each user with a password for personal authentication in dealings over the Internet. Under this system, after a buyer has ordered goods online,

payment from the credit card company or financial institution is made to the seller through the settlement services operator. Alternatively, the settlement services operator can be paid beforehand, and upon the buyer's receipt of merchandise, the payment is transferred to the seller.

Although still at the development stage, "electronic money" for Internet transactions is being tested as another way to pay for goods bought online, without needing to use credit card companies or other financial institutions. Meanwhile, however, since many users are still reluctant to transmit private information over the Internet, in reality many Internet commerce transactions are settled through such methods as postal transfers of cash, or cash-on-delivery. (Trends in the development of electronic money are discussed at I-5-2-(3)).

Furthermore, the use of settlement services for transactions between businesses in Japan is very rare.

Fig. Classification of transaction settlement



## (5) Financial services

### Managing personal finances online

The Internet can also be used to access personal financial services: mainly online banking and securities transactions.

Internet banking connects the home computers to banks online to receive services, such as checking the balance of one's bank account, or authorizing payments from it. In Japan, telephone banking for personal customers began as early as 1979, and banking services via home computers started in 1995. Two years later, the Internet began to be used to provide online banking. As of January 1999, six city banks and 21 major regional banks in Japan offered balance checking services over the Internet, while five of the city banks and 10 of the major regional banks also offered fund transfer services. In addition, some member banks of the Second Association of Regional Banks and Credit Associations provide similar online services.

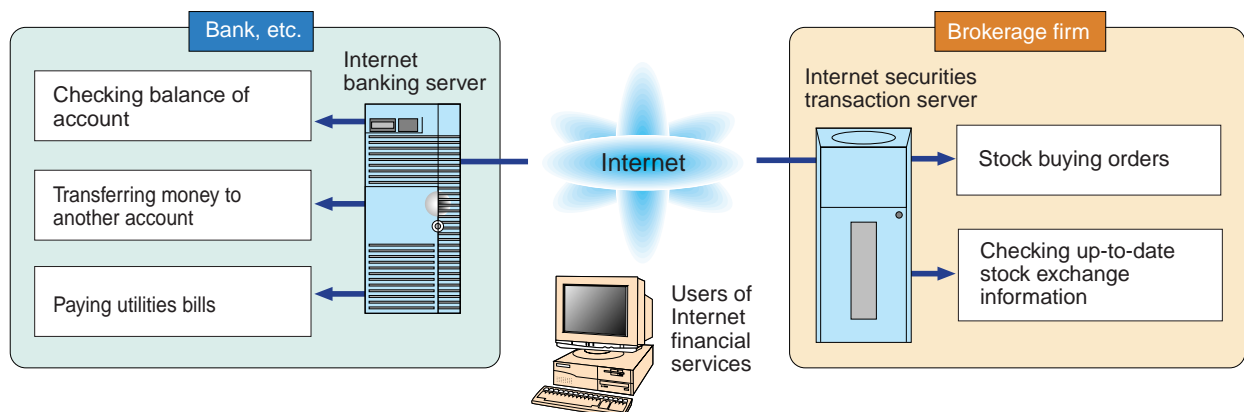
Securities transactions over the Internet started in Japan in April 1997, and by January 1999, such services were offered by 19 securities firms, allowing clients to check market trends from home via

the Internet and quickly send out orders for stock transactions. For some of the 19 firms, online accounts already represent about 20% of all the accounts they handle.

According to the 1998 "Survey of Usage Trends in Financial Online Services" conducted by a Japanese advertising agency, Dentsu Inc., 49.6% of all Japanese Internet users gathering financial information access websites to do so. However, the survey also showed that only 5.8% of Internet users in Japan used the Internet for online banking and just 3.1% for securities transactions.

A growing trend is the use of online financial services linked to software for managing household spending or payments in Internet commerce. Already in the U.S., financial institutions have appeared that operate only online, such as Security First Network Bank, NetB@nk and E\*trade. In future, financial services via the Internet are also expected to become a new force in Japan's financial sector.

Fig. Internet financial services



## (6) Advertising

### From targeting the many to a market of individuals

I-2

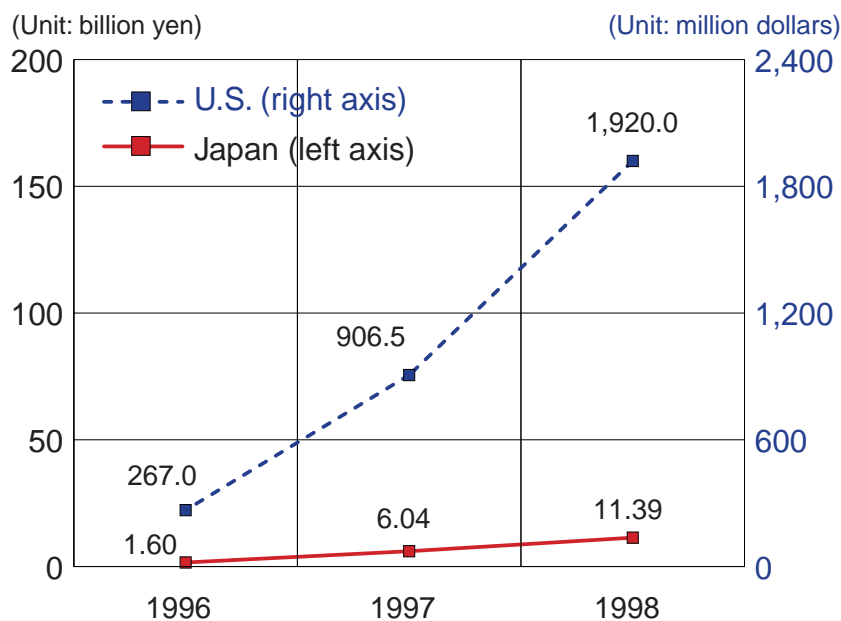
Internet advertising is defined as commercial advertisements carried online through such means as homepage banners and e-mail magazines. According to a survey by Dentsu Inc., in 1998 the Japanese market for Internet advertising was worth an estimated 11.39 billion yen. This was almost double the 6.04 billion yen of 1997. Although small compared with the market as a whole, Internet advertising has been growing rapidly in Japan. According to the Internet Advertising Bureau of the U.S., the U.S. Internet advertising market in 1997 was worth 906.5 million dollars, with the 1998 figure estimated at 1,920 million dollars (Fig.).

Since the beginning of widespread Internet use, homepages have often been used for corporate public relations activities. However, the Internet is increasingly being seen as an active advertising medium for the promotion of sales. The network is thus gaining attention as a new advertisement outlet, and especially in the area of banners on the "portal sites" through which people initially gain

access to the World Wide Web. These entryways are usually equipped with various items such as a search engine, news updates, online shopping and postings of other types of frequently updated information. The access rate to portal sites is high, and so it is very effective to place advertising banners upon them. From January to September 1998, the top five money-making advertising locations in the U.S. were all Internet portal sites, according to a survey by InterMedia Advertising Solutions.

In addition to usage of Internet sites that are accessed by large numbers of users, there is also a growing trend toward placing advertisements on sites that target people with specific interests. The Internet is rich in such locations; for example, chat rooms and other community sites that attract particular types of visitor, making them effective for advertising focused on certain groups (Refer to I-3-2-(1)). Meanwhile, on portal sites too, advertising is increasingly being tailored to fit user preferences.

Fig. Comparison of the Japanese and U.S. Internet advertising markets



Sources: "Advertising Revenues for Major Websites in 1996, 1997 and 1998," Dentsu Inc.; "Advertising Revenue Reporting Program," Internet Advertising Bureau of the U.S.

Related sites: Internet Advertising Bureau of the U.S. (<http://www.iab.net/>); Dentsu Inc. (<http://www.dentsu.co.jp/DHP/DOG/news/>)

## (7) Training

### Using the network to take training anywhere

In Japan, most companies and institutions usually gather people together to undergo training program at the same time and place. However, this can cause difficulties when a firm's branches are scattered or if it does not have central training facilities, and when employees have to travel away from their work locations. Because online training systems can help avoid such problems and reduce

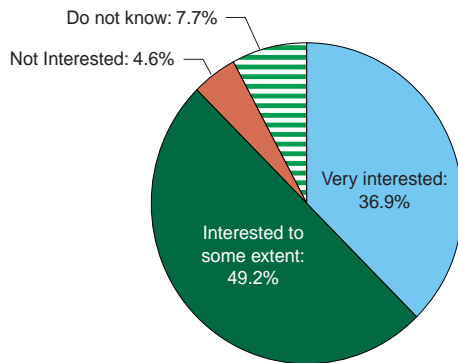
costs, as well as providing training on demand, companies and other organizations are beginning to introduce them (Fig. 1). In particular, with the spread of personal computers and local area networks (LANs) that permit improved access via the Internet to educational content, web based training (WBT) is attracting a lot of attention in Japan and some firms have already adopted it (Fig. 2).

Companies' use of WBT has been increasing in the U.S., where the use of the Internet is already very extensive. Meanwhile, several dozens of companies in Japan have developed and marketed WBT systems, including the "Virtual Campus" system released by Nihon Unisys, Ltd. in September 1998. This system is designed for ease of use with simple mouse operation and provides explanations and progress tests through voice and image guidance. Users can also ask questions and exchange information through chat rooms through e-mail. The "Virtual Campus" offers not only usual applications, such as word processing, but also study materials that are specially tailored to meet clients' needs. For instance, Nihon Unisys developed a special application for a mail-order company that not only provides sales staff with thorough knowledge of their products, but also acts as a manual in dealing with customers by telephone

while accessing the Internet for product information from the computer installed on each employee's desk.

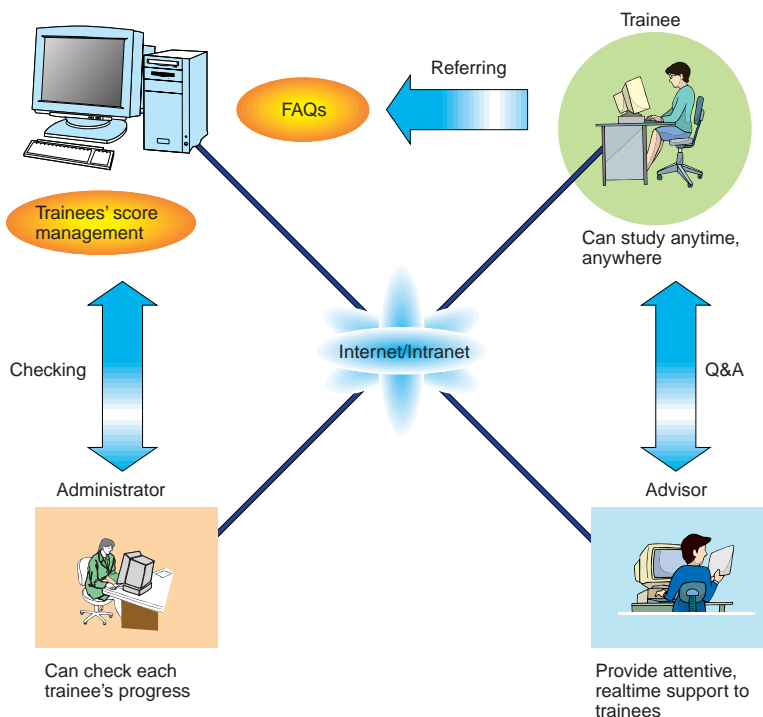
Hitachi, Ltd. and ASCII Corp. jointly developed another WBT system called "NET-T." This transmits via the Internet study materials to client companies' servers, and staff can then access the materials through their Intranet. Courses are offered on how to use computers, English language, finance and accounting, business management and other topics. Since November 1998, "NET-T" has also offered practical corporate management seminars taught by business consultants. The target users are company owners and managers, who can repeatedly take classes at home at any time through home computers connected to the Internet.

Fig. 1 Interest in WBT



Source: "Online Human Resources Development Survey," PHOENIX Promotion Council Secretariat

Fig. 2 Outline of WBT



Related sites: VirtualCampus (<http://www.unisys.co.jp/VIRTUALCAMPUS/>); NET-T (<http://navi.uz.ascii.co.jp/nbt/>)

## (8) Internet telephony

### Low-priced long-distance/international phone services via the Internet

I-2

Internet telephony, allowing interactive voice communications via the network, was originally possible only through computers connected to the Internet. Until recently, the system could not be used to send or receive calls using ordinary subscriber phones. However, following the liberalization of interconnections of both ends of leased circuits with public switched networks, commercial Internet telephony services were started in Japan in October 1996 for domestic phone calls and in August 1997 for international phone calls. For this service, 1) the voice data sent from subscriber phones via public switched telephone networks are converted into packet data at a gateway; 2) the packet data are sent over the Internet to another gateway near the called party, and 3) the data are converted back into the original voice data and sent to the called party via the public switched telephone network (Fig. 1).

The merit of Internet telephony is the low cost of long-distance or international phone calls. This is because there is no need to pay transmission charges for using the Internet, with the only cost being generated between the subscriber phones and the gateways to the Internet. Most Japanese Type I telecommunications carriers charge 240 yen for a daytime three-minute call between Japan and the U.S., while Internet telephony only costs around 75 to 135 yen (as of January 1999, Fig. 2). But Internet telephony also has disadvantages: compared with ordinary phone lines, the sound quality is worse, there can be transmission delays and intermittent disconnections occur.

The Internet facsimile transmission service is not as seriously affected by transmission quality and produces results close to those of transmissions via ordinary phone lines.

Fig. 1 System of Internet telephony

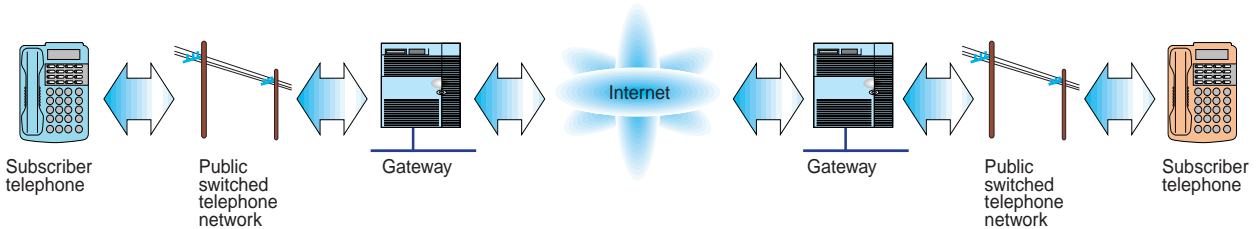


Fig. 2 Comparison of daytime 3-minute telephone call rates between Japan and the U.S. (January 1999)

