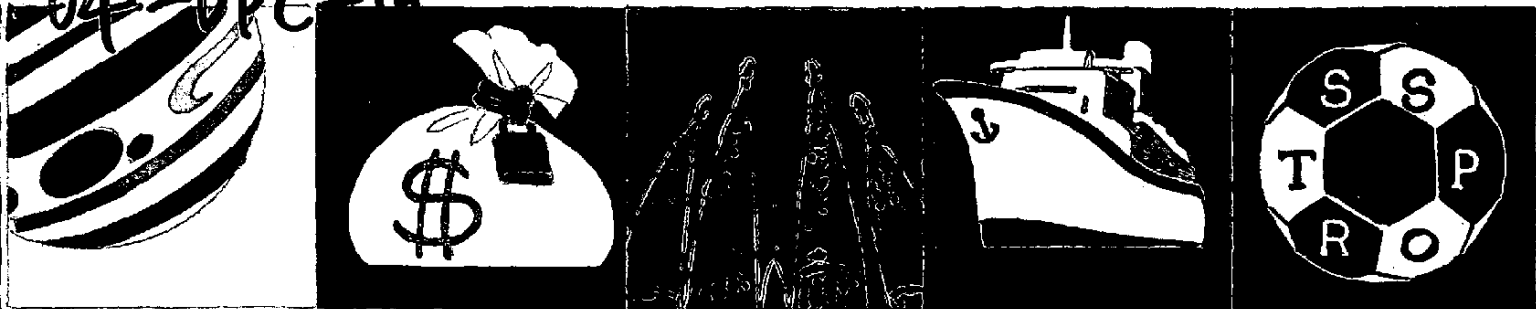
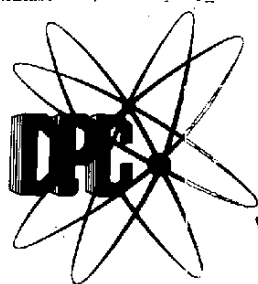


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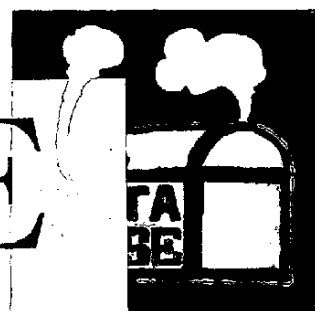


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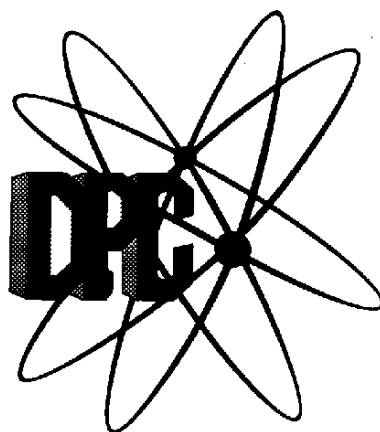


Database Promotion Center, Japan

Database Promotion Center, Japan (DPC) was established in 1984 with the information supplies, users and related industrial circles supervised by the government. DPC is a not-for-profit organization aimed at the promotion, research, production and dissemination of database services worldwide.

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Databases in Japan 1992



Database Promotion Center, Japan

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I. INTRODUCTION

1. Introduction

Living in the globally networked society of today, we are at a historic turning point in constructing a new world order for the 21st century. In Europe, the concept of a single united market led by the European Community (EC) is to be finalized at a summit scheduled for Edinburgh in December 1992. This crowns the six and a half years of preparations initiated in 1985 for the unification of the European commercial market. In certain regions of Asia and the Middle East, movements towards a new world order are underway; the long-awaited International Conference for Peace in the Middle East, the progressing dialogue between North and South Korea, and the signing of the Cease-fire Agreement in Cambodia are a few examples.

The changed attitude towards domestic matters and the booming Japanese economy, triggered by the strong yen, led to an economic situation where there was more money than one could spend and an all-time-low bank interest rate of 2.5%. This resulted in an unprecedented "bubble phenomenon," which sent stock and land prices skyrocketing. Now the bubble has burst and dismantled deficiencies in land policies, administrative measures in securities and finance, etc., taken by the government. With the above in mind, the conclusion is an unstable situation shaken by turbulent societal and economical waves surging from within and without. In order to cope with this, the role of databases, which enable us to pick up the appropriate information from a virtual torrent, ought to be valued.

The database-utilization environment in Japan now faces a big transitional phase. One of the driving forces of the transition is the dissemination of personal computer (PC) network services for Japanese PC users, with more than 1,000 operating companies and organizations throughout Japan. Along with an excess of one million subscribers, this makes up the grass

roots communication network. PC network services not only hook up members to each other but also more easily let them access databases through gateways. Thus, the scope of the database-utilization environment reaches beyond companies and government organizations, who are conventionally regarded as exclusive users, to consumers and individuals.

Databases will be further integrated and fused into many other aspects of our daily life, and at the same time extended to cover multimedia. The Palo Alto Research Center of Xerox Corporation has come up with a new concept for the computing environment of the future, dubbing it "ubiquitous computing." In an ubiquitous computing environment, they portray, computers will become so highly integrated and fused into everyday life that people may scarcely be aware of their existence. The same will certainly be true of databases. As their use extends more widely and deeply into society, they will further fuse with other data processing services and become more and more self-effacing, as is the case with transaction services of today.

What now demands attention is how distributed databases shall be incorporated into open systems. Conventional centralized processing systems use large-scale computers as hosts that intensively administer the databases. Recent systems, on the other hand, connect standalone databases accumulated in computers at multiple locations, or use available computers as if it were a single database, by exercising gateway functions. This type of system has been made possible through the down-sizing from large-scale computers to workstations and PCs, and the trend of diversification in network systems used in open systems. The Ministry of International Trade and Industry (MITI) has already addressed the issue of establishing a basic infrastructure for the Open Systems. Concurrently, this measure is the prime pillar for implementing a policy on developing an

information infrastructure in fiscal 1992.

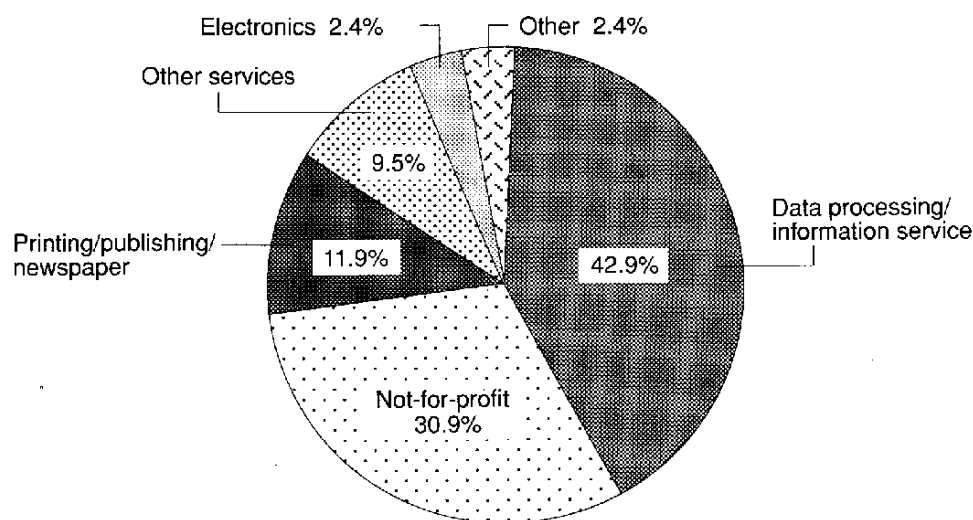
2. Trends of Database Service Industry in Japan and Europe

Database Promotion Center, Japan (DPC) conducted the "Survey of European Database Service Industries" for the first time in October 1991, in cooperation with the European Information Industry Association (EIIA). Here, we will compare the database service industries in Japan with those in Europe, taking advantage of the above mentioned survey and the "Survey of User Awareness of Database Services-Vendors," which was carried out by DPC in September 1991.

Among Japanese corporations, the largest entry to the industry comes from the "data processing/information service" with a share of 56.6%, followed by "other business-to-business services" (14.0%), "other manufacturers," including "printing/ publishing/ newspaper" (11.9%), and "public services" at 9.8% (see Figure 2-10). On the other hand, the European distribution of database service industry entry by industrial categories shows (see Figure 1-1) that the "data processing/information service" ranks atop at

42.9%, subordinating "not-for-profit organizations" (30.9%) to the second place. Not-for-profit organizations occupy a considerable ratio, a situation quite different from that of Japan. EIIA also pointed out that companies in the "printing/ publishing/ newspaper" business, who are supposedly beyond the information industry, occupied only an 11.9% share of the grand total, thus playing a less vital role for the development of database services.

The database service industry has taken in huge entries from various industrial categories, including the "data processing/information service" referred to above. These Japanese database services are mainly executed as a part of the business or as a by-product of the main business in the companies. Among the 101 companies responding to the survey, the statistics showed that sales of database services averaged 24% of the gross sales. However, companies dedicated to database services make up only 19.7% of the surveyed subjects (see Figure 1-2). A company is defined as being dedicated to database services if their database service sales amount to at least 50% of their gross sales. Nearly half of the companies recorded database service sales of less than 10% of their gross sales, which implies that companies in the Japanese database



Note: Categories of the parent business.

Figure 1-1 Breakdown by Industrial Categories of Respondents

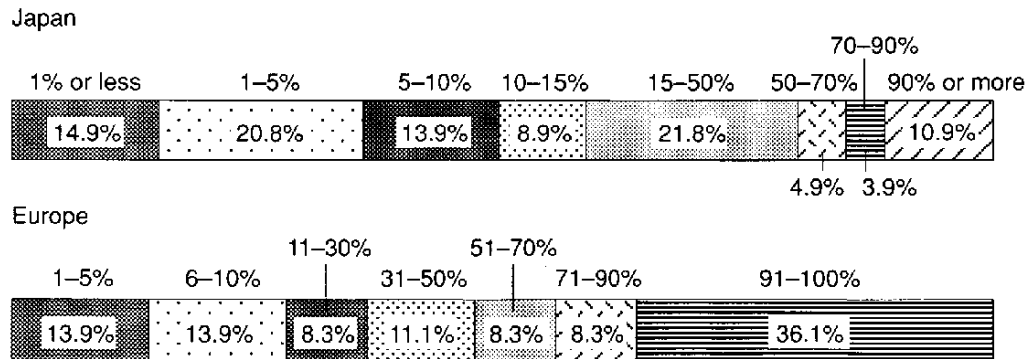


Figure 1-2 Ratio of the Sales of Database Services against Total Sales of Japanese and European Companies

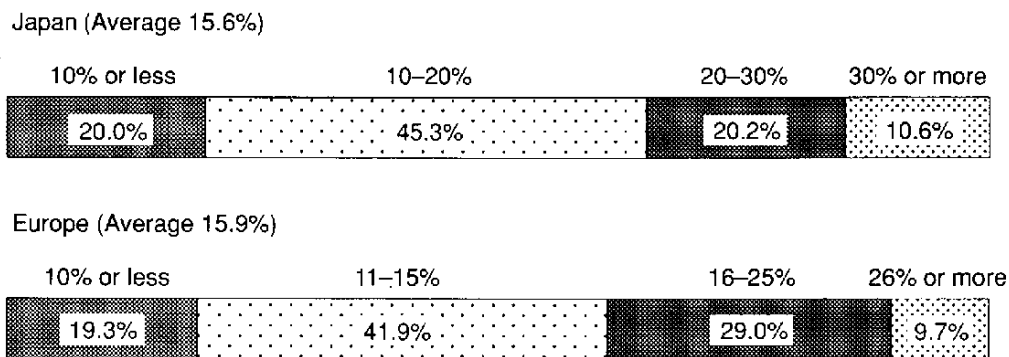


Figure 1-3 Estimated Average Growth Rate over the Next 5 Years of the Sales of Database Services

service industry are at a transitional stage, where business activity apart from database services is still very important. Despite this fact, many companies regard database services as highly prospective; currently, 41.9% of the less database-oriented companies regard databasing as "business of prime importance." Furthermore, 59.9% of all respondent companies believe that database services will grow into "business of prime importance" in the near future, which promises a good outlook for the industry.

Looking at the European market, we find that 52.7% of all European database service companies responding to the survey recorded database service sales of more than 50% of their gross sales. Adding to that, 54.8% of the respondents regarded database services as "business of prime importance." When asked about the future possibilities of database

services, 59.5% of the companies answered that it would become "business of prime importance," showing that European database service companies are ahead of their Japanese counterparts in terms of the degree of dedication.

Our forecast on the growth rate of database service market for Japanese and European companies over the next five years (see Figure 1-3) goes as follows. As for Japanese companies, the estimated growth rate is 15.6%, which is an average based on the guesswork of 95 respondents. The previous forecast was 18.6%, and the fall of 3 points presumably reflects the stagnant economy following the bursting of the "bubble economy."

The prospective growth rate on the European market is 15.9% (average based on the guesswork of 31 respondents), which is close to that of Japan. This

figure corresponds to the estimation presented by LINK Resources Corporation (LINK), being way above the prospected growth rate of North American companies (10.5%). Observing the distribution pattern of prospective growth rates, two-thirds of the responding companies predicted the market would grow at an annual rate of 11-25%. Four organizations out of six predicting an annual growth of less than 10% are not-for-profit organizations, two of which reside in European EC non-member countries. On the other hand, the three companies predicting an annual growth rate exceeding 26% all come from the private sector and are strongly interested in CD-ROM databases. It may be dangerous to draw the conclusion that this is the overall market trend in Europe, utilizing only three respondents' opinions; however, CD-ROM databases are highly likely to record big sales.

3. Utilization of Commercial Databases in Japan and the United States

3.1 The State of Commercial Database Utilization

Here, we will summarize the state of commercial database utilization by end users (private companies and other organizations) in Japan and the United States. This analysis is based upon the "Survey of User Awareness of Database Services" and the "Survey of User Awareness of Database Services in the United States," conducted by DPC in October 1991. This survey was conducted on 3,000 members of the U.S. Special Library Association (SLA), which boasts 13,000 librarians and information specialists.

95.2% of the surveyed American end users are taking advantage of online database services, exceeding by 28.8 points Japanese end users, for which the record stopped at 66.4%. This implies that database services have taken firm root in the American society. When classified in regard to company size, the ratio of small and medium-size businesses utilizing the services amounts to 87.0%, whereas for large companies the figure is 98.5%, and for public-service organizations 93.6%. All of those figures consider-

ably surpass their counterparts in Japan—57.4%, 70.5%, and 60.4% respectively (see Table 1-1).

Table 1-1 Utilization Ratio of Commercial Online Databases by End User in Japan and the U.S.

(%)

Country Business size	Japan	U.S.
Small/medium	57.4	87.0
Large	70.5	98.5
Public-service	60.4	93.6
Total	66.4	95.2

3.2 Contracting with Vendors

On the average, American end users take advantage of 5.3 vendors, as can be seen in Table 1-2. This is close to the situation in Japan, for which the average figure is 5.0 vendors. When classified by company size, large companies tend to utilize more vendors, averaging 6.1 vendors per company. Furthermore, 32.6% of the replying companies contract more than 10 vendors. This is presumably due to large companies' demand for a wide range of information. This demand in turn stems from multilateral business expansion, which has engendered an environment for using various kinds of information. As end users, large Japanese companies on an average contract 5.5 vendors, or 0.6 vendors less per company than their U.S. counterparts. Only 16.8% of all Japanese large-company end users contract more than 10 vendors, approximately half of that of the United States. On the contrary, 44.3% of all large Japanese end-user companies contract 1-3 vendors, exceeding their colleagues in the United States by 17.9 points. Small and medium-size businesses in Japan and the United States contract roughly the same number of vendors. On both sides, nearly half of all companies contract 1-3 vendors.

The most popular vendor in the United States is DIALOG, which is utilized by 92.2% of all end users. It is used in a wide variety of categories, disregarding company size. The following figures speak for themselves: 94.7% of all large companies utilize

Table 1-2 Number of Vendor Subscriptions by End Users

Number of vendor subscriptions Business size		(No. of companies, %)									
		1-3		4-6		7-9		More than 10		Average of vendors	
		Japan	U.S.	Japan	U.S.	Japan	U.S.	Japan	U.S.	Japan	U.S.
Small/medium		31 (47.0)	10 (50.0)	23 (34.8)	5 (25.0)	7 (10.6)	0 (0.0)	5 (7.6)	5 (25.0)	4.4	4.6
Large		145 (44.3)	34 (26.4)	84 (25.7)	41 (31.8)	43 (13.1)	12 (9.3)	55 (16.8)	42 (32.6)	5.5	6.1
Public-service		56 (69.1)	50 (50.0)	15 (18.5)	27 (27.0)	7 (8.6)	6 (6.0)	3 (3.7)	17 (17.0)	3.3	4.5
Total		232 (48.9)	94 (37.9)	122 (25.7)	73 (29.4)	57 (12.0)	17 (6.9)	63 (13.3)	64 (25.9)	5.0	5.3

Note: Figures in () are ratios of the total against companies in each vendor subscription range.

DIALOG, while the figure for small and medium-size businesses is 85.0%, and that for public-service organizations is 89.9%. As for other vendors, the ratio of end user utilization varies according to company size. Following DIALOG, large companies contract these vendors in descending order: Mead Data Central (70.2%), otherwise known as the Lexis/Nexis database, Dow Jones News Retrieval (58.0%), and Maxwell Online (30.5%). The second preference for small and medium-size businesses is CompuServe (45.0%). Database services through CompuServe mainly consist of gateway services through PC network service, offering relatively cheap utilization fees. CompuServe is to be considered as a vendor for the general public. Following CompuServe are Mead Data Central (35.0%), and Dow Jones News Industrial (30.0%).

On the Japanese market, no vendor is as outstanding as DIALOG is on the American market. Looking at utilization by database vendor, most frequently used is JOIS (48.0%), followed by Nikkei Telecom (38.9%), PATOLIS (37.9%), DIALOG (36.7%), STN International (12.1%), and G-Search (6.7%). JOIS is more utilized by small and medium-size businesses (52.2%) than by large companies (44.9%). Nikkei Telecom and PATOLIS are more frequently used by large companies, with a utilization ratio of 40.2% and 44.6%, respectively. As in the United States, DIALOG is extensively used regardless of company size.

3.3 Media for Access to Database Services

Analyzing the methods for accessing databases

in the United States reveals that online access is still the most popular means of information retrieval. 95.6% of all end users utilize online services, subsequently followed by CD-ROM (61.4%), fax (60.7%), floppy disk (FD) (28.7%), and magnetic tape (MT) media (25.7%). 98.4% of all Japanese end users use online services; however, they utilize CD-ROM much less frequently than their U.S. counterparts, recording only a 12.4% share of all access media. The reason for the infrequent use of CD-ROM lies in the following basic comments from end users: "Necessary information has not been compiled into CD-ROM yet" (35.6%), "Information is updated slowly" (26.8%). Thus, in Japan the use of CD-ROM as an access medium is still in its infancy stages.

In the United States, 61.4% of all end users utilize CD-ROM; however, 79.0% of end users say that they "consider using CD-ROM in the future." On the other hand, the use of online services has dropped to 86.0%. At present, 39.1% of the surveyed small and medium-size businesses use CD-ROM. However, this figure is expected to record a skyrocketing 71.4% share of the access media in the future. This is because CD-ROM relieves users from paying basic charges for connecting time, which is due for online services. Also, CD-ROM production costs will dwindle as the technology advances.

American end users properly know how to use these two types of media—online services and CD-ROM. When time-sensitive information such as news, equities, commodities, foreign exchange and money market information is needed, it is reached through online services; when in search for medical infor-

mation, science/technical literature, etc., CD-ROM are of main avail. In this way CD-ROM and online services complement each other, leading to further development of interconnectivity between these types of media.

According to the survey conducted by LINK, gross sales of CD-ROM in the United States reached \$484 million in 1990, occupying 5.1% of the American database service market. These sales are predicted to grow at an average annual rate of as much as 40.5%, and sales will amount to \$2.65 billion in 1995, or 5.5 times that of 1990. This amount would account for 17.0% of the whole market and make CD-ROM second to none but online services (62.0%), by far exceeding the share of MT (5.4%).

3.4 Degree of Satisfaction in Using Database Services

93% of the surveyed American end users expressed satisfaction in using database services; however, 64.9% of them reckoned user fees too expensive. This ratio is close to that of the Japanese end users.

In using online databases, American end users mostly gather information in two ways, namely "through the information center or library in the company" (68.4%) or "through direct, personal access to databases" (60.1%). Most large companies and public organizations access databases through the former method, with utilization rates standing at 72.2% and 73.1%, respectively. The latter method is mostly used by small and medium-size businesses at a utilization rate at 66.7%.

The proportion of company and organization personnel who can access information from databases is mirrored in the following statistics: "very few" (65.5%), "less than half" (16.1%), "about half" (7.7%), "most" (5.7%), and "all" (5.0%). Specifically, large companies tend to have special departments for information retrieval, thereby lessening the number of in-house database searchers. In contrast with this, small and medium-size businesses, rarely featuring special database search departments, incline to heigh-

ten the proportion of in-house database searchers. Regardless of company size, 65.0% of the respondents answered that they were satisfied with the proportion of their in-house database searchers.

49.7% of the Japanese end user companies also feature special departments for information retrieval within their companies and organizations. Although the number of searchers capable of information retrieval varies with the size of the company, most Japanese end users replied that the present number of database searchers available is satisfactory, in that it remains at the same level as in the United States (63.0%).

Passwords are indispensable for utilizing online database services. More than half of the surveyed American end users keep exclusive passwords for each searcher. A single password is shared by an average of 2.5 persons. In Japan, 14.0% of the end users hold an individual password, while 51.5% share a password "among less than four individuals." The average number of people using one single password stands at eight.

With respect to training and education of database searchers, more than half of the end users are taking measures, and state that "employees are sent to seminars and courses held by database vendors," or "employees learn on the job" in both Japan and the U.S.

3.5 In-house Databases

In-house databases utilized by private and public organizations for their own use is actively produced both in Japan and in the U.S. Table 1-3 indicates that, in the United States, 81.4% of the surveyed companies

Table 1-3 Ratio of Japanese and U.S. Companies with In-house Databases

		Country	
		Japan	U.S.
Business size			
Small/medium		53.3	60.0
Large		70.5	84.6
Public-service		62.7	80.4
Total		66.7	81.4

(%)

and organizations produced and retained in-house databases. Breakdown by company size shows that 84.6% of the large companies have in-house databases, while the figure for small and medium-size businesses remains at 60.0%. This figure suggests a large gap—24.6 points—between large companies and small/medium-size businesses. Comparing the retention rate of in-house databases by industry, industries in which 80% of the companies or more have installed in-house databases are arranged in the following order: manufacturers, public-service and government organizations, law firms and management consulting firms, and other business-to-business services. In this comparison, the telecommunication and database service industries provide the fewest in-house databases per company at a mere 50.0%.

The most common reason for making in-house databases is "to effectively utilize information" at a rate of 81.1%, followed by "to establish effective inventory management" (45.8%), "to establish an effective ordering system" (41.8%), "to establish an effective management system" (39.8%), and "to establish a strategic information system (SIS)" (38.3%). However, producers' intention for putting those in-house databases on the commercial market is relatively low, holding the rate in its favor at only 10.6%.

Meanwhile, in Japan 66.7% of the surveyed companies and organizations retain in-house databases. Compared to the retention rate in the United States the Japanese market lags 14.7 points, showing a considerable delay in comparison to those in the U.S. in producing in-house databases and commercial utilization of database services.

Although the gap between companies of different size is not as huge as in the U.S., it amounts to 17.2 points. 70.5% of the surveyed large companies retain in-house databases, while small and medium-size businesses stand at 53.3%. The rate at which different industrial categories retain in-house database shows, with the highest rate of usage first, "finance/insurance" (80.0%), "electric/machinery/transport equipment" (75.0%), and "oil/chemistry"

(73.0%). On the other hand, the industrial categories of "iron and steel/non-ferrous" (60.3%) and "data processing/ information service" (61.4%) remain at low rates. Retention rates classified by industry show a tendency similar to that of the United States.

The most common reason for producing in-house databases is, as for the U.S., "to effectively utilize information" (46.1%), followed by "to establish an effective management system" (39.7%), "to establish effective inventory management" (34.1%), "to establish an effective ordering system" (33.4%), and "to promote sales" (32.5%).

Only 11.4% of the responding organizations intend to put their in-house databases on the market, a rate as low as that of the United States. Originally, in-house databases are set up to improve the utilization of in-house information, and to make management and sales promotion more effective. Thus they are completely different from commercial databases, which are produced according to marketability.

4. Individual Utilization of Commercial Databases in the United States

The United States is called "the single nation where database utilization is developed." Then, how do individuals and families put databases to use in real life? DPC has conducted a survey on American PC network service users in order to investigate the actual state of database utilization in the daily lives of individuals and families. This survey is the American counterpart of the "Survey of Database Utilization through PC Network Service" for the users of NIFTY-Serve, the largest online service for PC users in Japan, under the license of CompuServe, Inc.

This survey was conducted in November 1991, taking advantage of the Bulletin Board System (BBS) of the CompuServe Information Service (CIS), the world's largest online PC network service company with approximately 890,000 users (as of October 1991). Out of 1,185 repliers to the survey, 89% were male users. As for age distribution, users in their 30s and 40s each answer for one-third of the utilization.

The conclusion is that the average database user is a businessman in the prime of his life.

Analysis of the survey indicates that users take advantage of databases mainly for business purposes. Looking at the reasons for using commercial databases, we find that utilization for research purposes ranks atop at the rate of 42%. Following thereafter are utilization for hobbies and life style (20%), and business (19%). From the above statistics, it can be concluded that nearly half of all home database utilization is related to business.

The results of the survey describe that the reasons for database utilization at home can be divided into two categories: business utilization and daily-life utilization. In the United States, commercial database utilization for business purposes is more widespread than in Japan. One reason is that most repliers are business people; however, the survey shows that a very large number of users are business people who retrieve whatever business information they want for business purposes through using online database services at home.

When asked whether they have obtained any information on Japan via CIS, 7% of the surveyed American users answered in the affirmative, stating their high level of interest in Japan. Moreover, 29% of the repliers have some experience with CD-ROM, proving the diffusion of CD-ROM on the American market.

5. Trends of In-house Databases

The information society is rapidly maturing, and the importance of SIS (Strategic Information System) establishment has greatly increased. The SIS movement got activated in 1985, when communication services became liberalized. This upward surge is reflected in the production of in-house databases available in restricted environments such as companies, government agencies, and schools. According to the "Survey of User Awareness of Database Services," both large companies and small/medium-size businesses enjoyed a double-digit growth in the

production of databases after 1985. Also, 1985 came to be a turning point for small and medium-size businesses, which are heavily influenced by SIS to equip themselves with tools for strategic management. The "Law of Adjusting Retail Business Operations by Large-scale Retail Stores" was modified, which eased many restrictions and led to tough competition among companies wanting to expand the networks among manufacturers, wholesalers, and retailers in the distribution industry. It is also expected that SIS hereafter will play a crucial part in the financial and travel industries, as applicable regulations are due for relaxation. Today, SIS can no longer be a special maneuver for companies to succeed in business competition in advance. Rather, companies equipped with SIS are presently supposed to compete with each other to gain as much market share as possible. Thus, high-quality in-house databases are becoming essential in order to survive this competition.

On the other hand, the competitive environment of today with its rapid changes requires quick adaption to the growing information systems, which as a result leads to preserve competitiveness. With the above in mind, it is clear that the information society is undergoing no less than a paradigm shift, called "downsizing." This aims at managing information where it is obtained and processed, a completely different concept from the conventional, centralized information processing system in which a large-scale computer is in control. It is also a paradigm shift into computerization, aiming for more economical handling as well as sensitivity to environmental changes. This new trend has already reflected itself on the market. According to the Nikkei Watcher on IBM published in September 1990, PC sales finally exceeded that of large-scale computers as of 1990. This indicates that the so-called downsizing phenomenon is underway even in Japan.

Downsizing has an enormous effect on the production of in-house databases. Apart from conventional, mainframe-oriented databases, the production of distributed in-house databases available on PCs is expected to rise sharply. These types of

databases are becoming increasingly available in various fields.

Another trend is the expansion of new businesses that apply database utilization for managerial purposes. With database-related technology under development, the flow of information has begun to reach down to personal-use level. Consequently, information networks have enabled customers to search for goods through databases. Examples of such new businesses are second-hand car retail services by Japan Total Network (JTN) and silver-market databases. Stork Corp., a catering company, has set up a database containing data on each customer's lunch menu. The possibilities seem endless. These new businesses are worthy of attention, because they differ from conventional commercial database businesses in that they do not sell information itself as a commodity.

6. The State of Database Production Outside Tokyo

In developing a regional database service industry, promotional bodies have gradually been established in each area. In July 1991 Shikoku Database Promotion Association, the very first database promotion organization in the Shikoku area, was set up. This forum was backed by 107 organizations, responding to the appeal from forerunners such as Shikoku Electric Power Company, Inc., Shikoku Railway Company, the Shikoku Economic Federation, the Shikoku Bureau of International Trade and Industry, etc. In October 1991, a planning and administrative committee was set up within the Forum, offering seminars on database utilization, opening up lecture meetings, and compiling the Shikoku Database Directory.

Meanwhile, in the Tohoku district, an uncultivated area as well, plans are to found an institute for database promotion. Setting up the Study Committee for Promoting Computerization of the Tohoku Area is now being reviewed by a cooperative body backed by both the public and the private sector. The commission is supposed to take office in 1992.

The local area organizations which DPC supports are scattered over the following five districts: Hokkaido, Tokai/Hokuriku, Kansai, Chugoku, and Shikoku. When the Tohoku area has been developed, only two districts will remain: the Kanto and Kyushu districts.

The latest topic on regional database promotion is The Hokkaido Shimbun starting a news database service—accessible for a fee—in December 1991. The newspaper company opened a cutting-edge news station, the DOSHIN AURORA NET, in March 1990, which supplies news, electronic mail services, etc. The recently commenced database service may well be likened to news retrieval services. Similarly, The Kahoku Shimpō-Press in Tohoku is planning to start a news retrieval service, scheduled for August 1992. Many other news agencies, for example The Chunichi Shimbun, are racing to get their database services on the right track.

The promotion organizations of each respective area are at hard work; the Hokkaido Database Promotion Association has compiled the Database Directory 1991, and the KANSAI INSTITUTE OF INFORMATION SYSTEMS published the "Study on Database Services in Regions," a publication supported by MITI. The Tokai-Hokuriku Database Promotion Association set up a fact-finding tour to investigate the American database service industry; 18 people joined the tour.

According to the MITI Survey of Selected Service Industries, the database service industry in 1990 encompassed 327 companies with a sales total of ¥188.6 billion. These figures correspond to the 13% increase from 1989 in number of companies and the 19% sales increase. Most characteristic is that the Tokyo area, in which 46% of the companies reside, achieved an outstanding 84% of the total sales. This degree of centralization has not changed much in the past few years. In the Tokyo area, sales per company run up to ¥926 million, about six times as much as the national average excluding Tokyo. However, sales per company in Tokyo area dropped by 3% from the previous year, while that in local areas increased by

12%, indicating the strenuous efforts of local companies and its consequences.

As for database utilization, password registration at the TEIKOKU DATABANK (COSMONET), Tokyo Shoko Research, Ltd., and The Nihon Keizai Shimbun, Inc. shows that 48.2% of all passwords origin from the Tokyo area, explaining the dissemination of information needs to local areas.

7. What's New in Database Technology and Legal Issues

Subjects related to new database trends are distributed databases, open systems, multimedia databases, and object-oriented databases, all recent technological development trends. In addition to that, we will introduce some of the latest activities in telecommunication and PC network service for utilizing online databases. Furthermore, in regard to issues on database-related regulations, we will sum up the following issues as database-related new movements: intellectual property rights and the legal protection of databases, telecommunication and PC network services to use online databases via gateway services and the laws applicable to privacy, as well as security issues.

7.1 Database-related Technology Trends

The mainstream of today is a systematic transition from centralized information management systems, in which a large-scale computer plays a core role, to new information management systems supposed to operate in network environments. In these new systems, the idea is that workstations and PCs linked to the same network should be able to process the same information at the same time.

In conventional computing environments, IBM-based operating systems have been utilized. However, this is gradually changing, and soon we will see networks with an open system architecture. To smoothly pass through this transition phase, a UNIX-based, distributed database system is required. The popular term "downsizing" refers to overcoming this

obstacle.

The release in 1991 of Microsoft Windows 3.0, a multimedia operating system for the PC, initiated the multimedia boom and full-scale dissemination of multimedia databases using CD-ROM.

Examples of multimedia applications are electronically-controlled publishing processes such as DTP (Desk Top Publishing) or multimedia publication systems taking advantage of media such as CD-ROM or CD-I. Multimedia, in a broad sense of the word, can also be said to encompass car navigation systems showing the traffic location of the automobile via an on-board display unit. These navigation systems are aided by CD-ROM maps and a Global Positioning System (GPS), using military satellites launched by the U.S. Department of Defense for confirming the present position.

Recently, object-oriented systems have entered the limelight in the fields of multimedia database production, software development, etc. Behind the scenes there is a defined lack of software engineers, and heightened productivity and reliability in software development is imminent.

7.2 Legal Issues Concerning Databases

There are presently a lot of problems to be solved concerning the development of database production and services. Specifically, there are a variety of international issues on how to protect the rights of database developers and how to cope with illegal access to information contained in databases. As for measures taken to illegal access to databases, it is important for information system developers to technically secure the safety and reliability of databases. However, and needless to say, a system must be formulated to legally cope with malpractices against database services.

With respect to database copyright protection, the definition of intellectual property is now being discussed at World Intellectual Property Organization (WIPO) and the GATT Uruguay round. Internationally cooperative efforts will be necessary to establish integrated worldwide rules for database protection.

Since the 1970s, the number of databases containing information on individuals in the hands of private enterprises and public organizations has increased rapidly. As a result, these databases are exposed to the menace of various types of malfeasances. As a measure against such malpractices, provisions of the Civil Code have so far been applied; henceforth, however, the Copyright Law, the Unfair Competition Prevention Law, and the Criminal Penal Code will be considered whether to apply to the cases.

In addition to the above, a crucial point is how to balance between the following two issues: presentation/prevalence of individual information data incorporated in commercial databases, and protection of privacy.

Regarding the security issue, a group led by the Japan Information Processing Development Center (JIPDEC) is engaged in setting up guidelines and hosting symposiums on the issue, trying to spread the concept domestically. Overseas, OECD is now determining a set of standards called Information System Security Guidelines.

One of many recent movements concerning database protection is the establishment of the Japan Reprographic Rights Center (JRRC).

This institute was established on September 30, 1991, since the two major founder groups, the Copyright Council of the Academic Societies, supported by the Federation of Economic Organization, and the Copyright Council of Publishers, supported mainly by publishing companies, had long gridlocked on the issue whether to include "Publisher's Rights" in a law to protect publishing companies.

What the institute is trying to do is to retain the sole duplication rights of copyrighted publications with the copyright holders, to give permission to copy the publications, and to charge a copying fee. The institute is supposed to establish duplication regulations for entrusted copyrighted publications to exercise the holders' rights. With these regulations, the institute is obliged to draw up permission contracts with private companies, universities, research institutes, and libraries.

II. THE CURRENT STATE OF COMMERCIAL DATABASES

1. Trends of Database Service Market

1.1 Definitions and Classifications of Databases

Since there are not any international criteria for the definition and the classification of databases, comparing database markets on an international basis is difficult in terms of size, etc.

As one of the leading database market research companies, LINK defines database services as "electronic information services" through which information is offered in electronic form or on electronic media. In Japan, the Reformed Copyright Law of 1987 defines databases as "aggregates of papers, numerals, graphics, and other information, formed in a manner to enable search using computers."

Be that as it may, database-related communications technology and media are rapidly being improved and standardized, and information provision and utilization is becoming quite diversified. Thus, databases must be defined and classified in a broader sense.

Databases are divided into two types, i.e., commercial databases available to anyone ready to pay the usage cost, and in-house databases produced by private and public organizations for their own use. In this section, we will look at the state of commercial databases. For information on in-house databases, refer to "I. Introduction."

Apart from the classification above, databases are also classified by characteristics as being either reference databases or factual databases. Reference databases are sometimes referred to as "text databases," and include bibliographical entries and abstracts of original information on articles and papers. These databases serve as guides to original information. On the other hand, factual databases, also called "source databases," stores this original information.

Factual databases contain either text, numeric, image or audio-visual information. The number of these databases is expected to increase together with the advancement of multimedia technology.

1.2 Trends of Database Service Industry Sales

Since 1973, MITI annually conducts a survey regarding the size of the database service industry market. This survey is designated MITI statistics, and is called the "Survey of Selected Service Industries." The survey clarifies the market trends of the information service industry, the leasing industry, and the advertising industry. In addition to the above three industries, MITI surveys many other industries, such as the credit card industry, the fitness/golf club industry and the funeral service industry.

According to the above statistics, the database service industry plays a key role among information service industries. The 1990 edition of the "Survey of Selected Service Industries" (issued in December 1991) accounts for the total sales of ¥5.88 trillion of the whole information service industry. In recent years, sales have gone up at a dramatic pace, or by ¥1 trillion per year (see Table 2-1).

In 1990, database sales totaled ¥188.6 billion, which marks an increase by 2 points compared to the sales of ¥157.6 billion in 1989. Viewing this in five-year increments, database sales totaled ¥14.4 billion in 1975, ¥44.1 billion in 1980, ¥100.8 billion in 1985, and ¥188.6 billion in 1990 (see Figure 2-1).

1.3 Distribution of Databases by Category

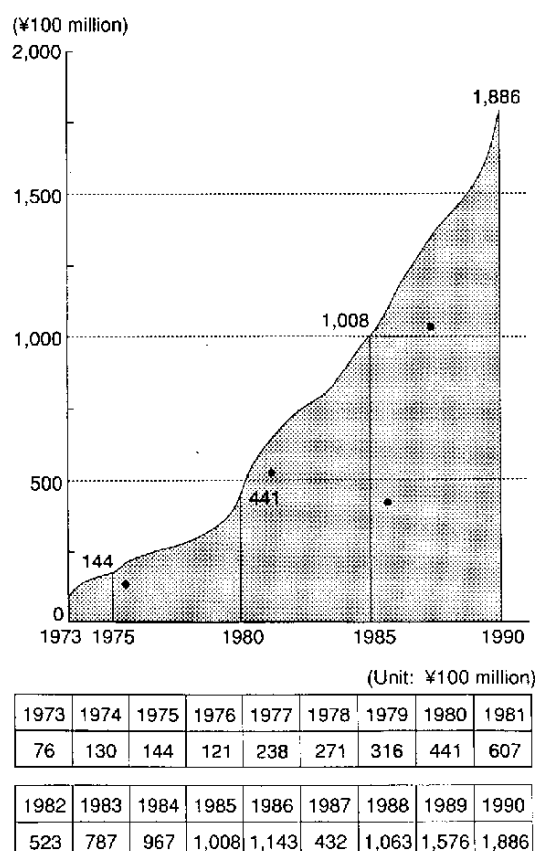
(1) The Number of Databases Exceeds 2,300

The distribution of databases is listed in MITI's "Database Directory," which has been issued annually since 1982. All databases available in Japan are listed in this reference guide. According to the 1990 edition of "Database Directory" (issued in October 1991), the actual number of databases available in Japan is 2,354.

Table 2-1 Annual Sales by Various Information Service Sectors

Classification	1989			1990		
	Annual sales (¥1 million)	Ratio (%)	Increase from the previous year (%)	Annual sales (¥1 million)	Ratio (%)	Increase from the previous year (%)
Total	4,351,430	100.0	132.0	5,876,496	100.0	135.0
Data processing	745,218	17.1	117.3	963,333	16.4	129.3
Online information processing	445,097	10.2	124.7	648,791	11.0	145.8
VAN	141,287	3.2	144.1	203,400	3.5	144.0
Data processing	303,811	7.0	117.4	445,391	7.6	146.6
Offline information processing	300,121	6.9	107.8	314,542	5.4	104.8
Software development and programming	2,512,535	57.7	139.7	3,461,689	58.9	137.8
Software development	2,159,326	49.6	138.7	2,909,581	49.5	134.7
Sales of software products	353,209	8.1	145.9	552,107	9.4	156.3
Data entry	166,375	3.8	101.6	204,434	3.5	122.9
Machine time sales	39,024	0.9	158.0	53,628	0.9	137.4
Facility management services	214,663	4.9	125.0	275,830	4.7	128.5
Database service	157,620	3.6	148.3	188,618	3.2	119.7
Online	109,223	2.5	154.4	129,009	2.2	118.1
Offline	48,397	1.1	136.0	59,610	1.0	123.2
Various types of research	204,150	4.7	135.6	260,935	4.4	127.8
Market research	110,309	2.5	126.2	132,937	2.3	120.5
Other research	93,841	2.2	148.6	127,998	2.2	136.4
Miscellaneous services	311,846	7.2	126.7	468,029	8.0	150.1

Source: "Survey of Selected Service Industries", MITI, July, 1991



Note: In 1987, business classification standards were partly revised, which caused "Information Supply Service" to be renamed "Database Service." Accordingly, the graph was drawn up using estimated values in case of statistics, which are shown as points in the graph.

Source: "Survey of Selected Service Industries," MITI.

Figure 2-1 Transition of the Annual Sales of Database Industry

This is five times that of the 1982 figure of 456, when the directory was first issued, and twice that of five years ago, in 1985.

Some databases are offered by multiple distributors. These "duplicate" databases are also listed in the "Database Directory," making up a total of 3,313 listed databases in the 1990 issue. For simplicity, we will in this section only refer to the actual, or normalized, number of databases (see Figure 2-2).

(2) 34% of the Available Databases are Japanese

Distribution of Japanese databases is steadily increasing, and in 1990, 34.3% (808 databases) of all available databases were Japanese.

Since 1986, the proportion of Japanese databases has grown at annual ratios of 20%, 24%, and 27% in each respective year. In 1989, the growth ratio exceeded 30%, and the current growth ratio is expected to approximate 35%. It is difficult to produce databases; therefore, this steady increase must result from an increasing interest in Japanese

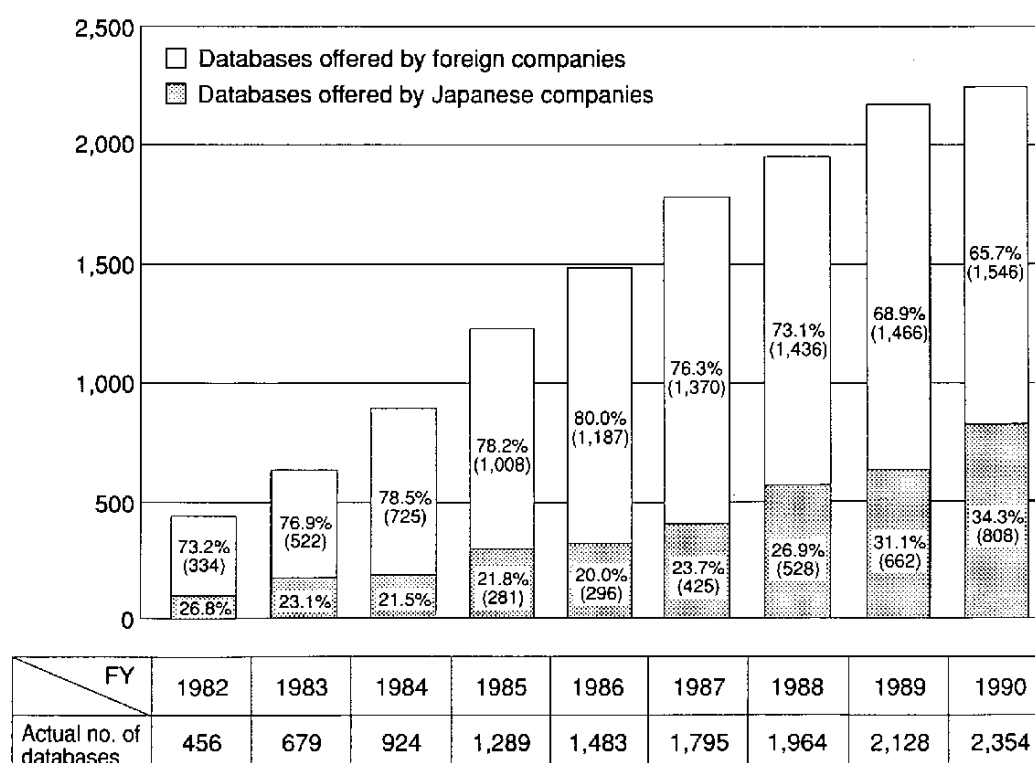
databases.

(3) Utilization by Category

The information on databases listed in the "Database Directory" is divided into four main categories; "general," "natural science/technology," "humanities," and "business." In 1990, the "business," at 38%, accounted for the largest share of total database utilization, followed by "natural science/technology" at 31%.

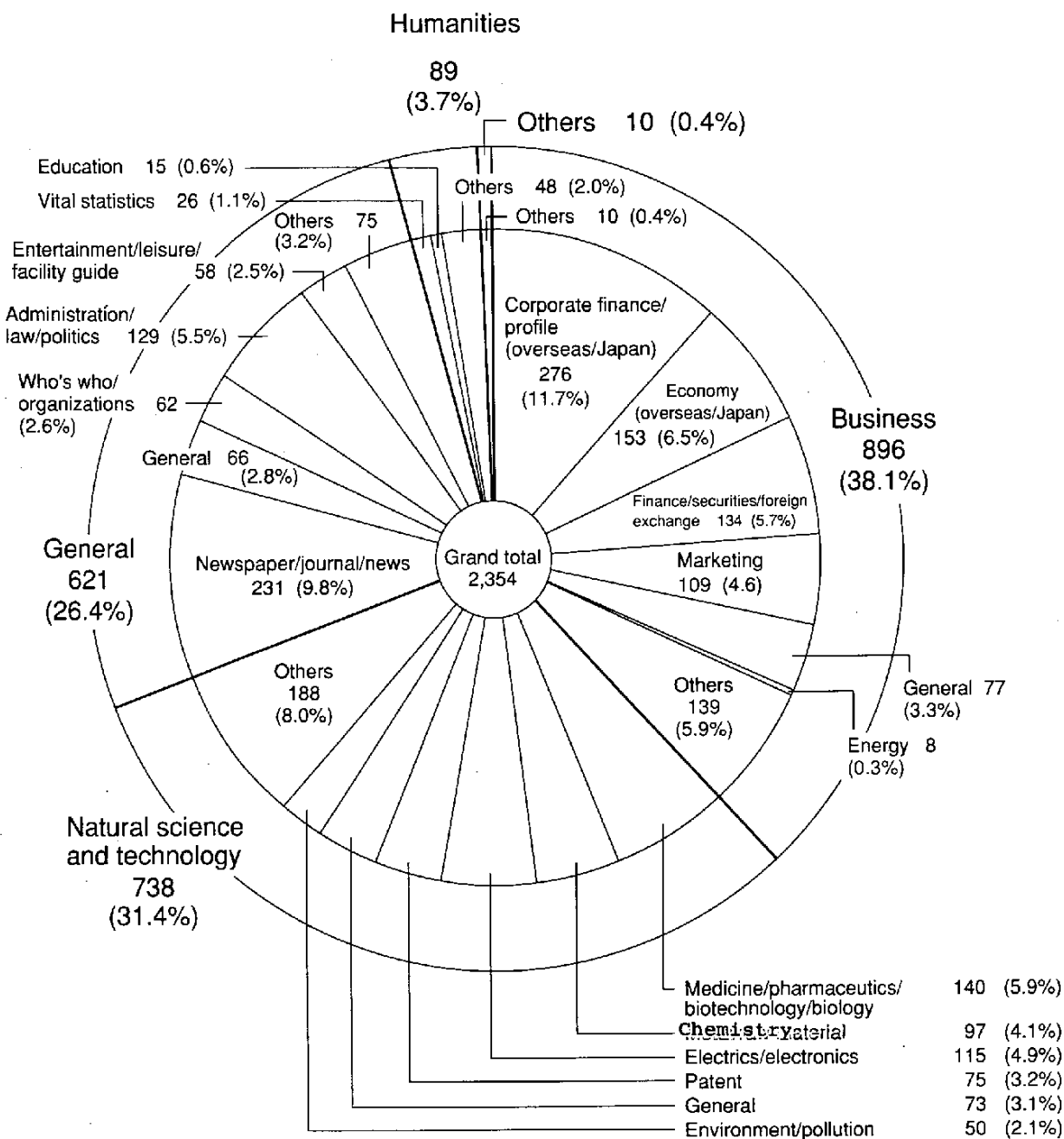
The "newspaper/journal/news" and "who's who/organizations" fall under "general"; however, these databases are mostly used for business purposes, and if these are included in the "business," more than half (51%) of all database utilization is for the purpose of business (see Figure 2-3, 2-4, and 2-5). For the last five years, when including these two categories, the "business" has always amounted to more than a 50% ratio of all database utilization (see Table 2-2).

The directory also lists subcategories of the above mentioned four main categories, and thus provides a more explicit view of the information



Source: "Database Directory," MITI

Figure 2-2 Databases Accessible in Japan



Source: "Database Directory," MITI, 1991

Figure 2-3 Distribution of Databases by Category

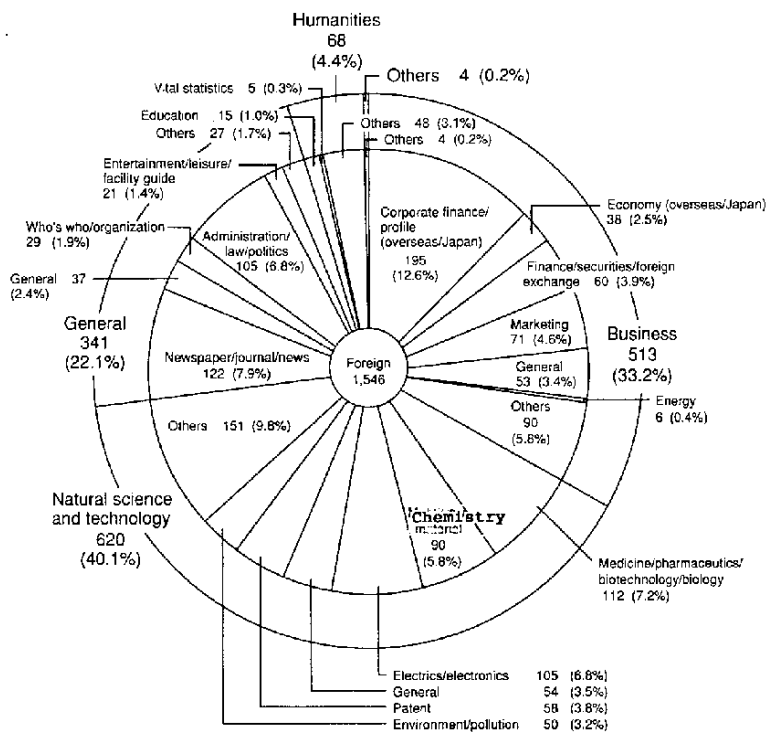
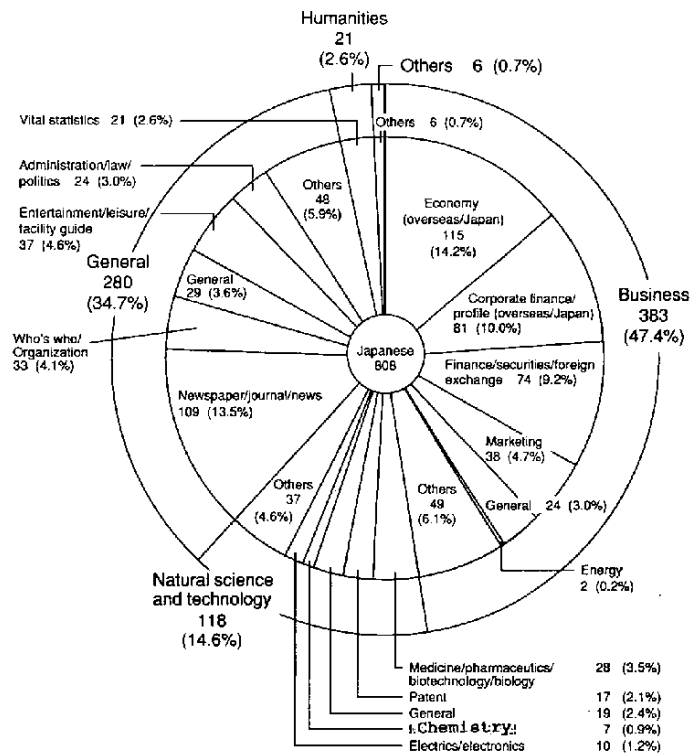


Figure 2-5 Distribution of Foreign Databases by Category

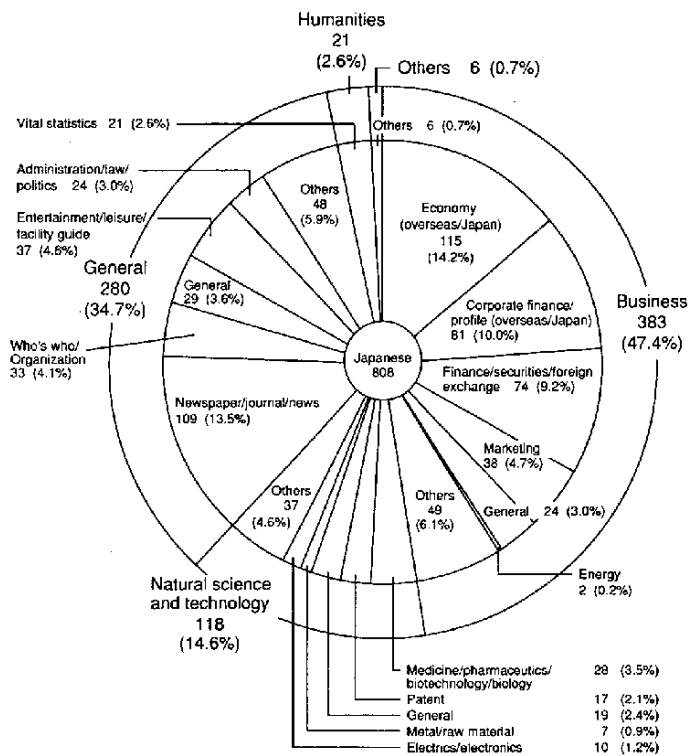
Source: "Database Directory," MITI, 1991

Figure 2-5 on page 17 is incorrect, and should be replaced with the above.



Source: "Database Directory," MITI, 1991

Figure 2-4 Distribution of Japanese Databases by Category



Source: "Database Directory," MITI, 1991

Figure 2-5 Distribution of Foreign Databases by Category

**Table 2-2 Transition of Database Distribution Ratio by Category
(Actual No. of Databases)**

Category	1986	1987	1988	1989	1990
General	18.0%	19.8%	21.4%	24.9%	26.4%
Natural science and technology	30.9	27.6	31.1	29.6	31.3
Humanities	4.0	3.6	3.9	3.8	3.8
Business	46.9	48.9	43.3	41.4	38.1
Others	0.2	0.1	0.3	0.3	0.4
Total	100.0	100.0	100.0	100.0	100.0
Total number of databases	1,483	1,795	1,964	2,128	2,354
Business (modified value)	52.7%	57.5%	54.1%	53.1%	50.5%

Source: "Database Directory", MITI

stored in databases.

Between 1989 and 1990, utilization of the "newspaper/journal/news," "administration/law/politics," and "entertainment/leisure/facility guide" subcategories increased notably. In the "natural science/technology," the "patent," "medicine/pharmaceutics/biotechnology/biology," "electric/electronics," and "metal/raw material" subcategories have become more popular. Also, a larger number of people who search the "business" have become interested in overseas "corporate finance/ profile" information.

The growing popularity of these databases confirms that they must be developed in order to meet user needs, and that these databases are closely related to today's international environment, life-style changes, and hi-tech development.

(4) The Ratio of Factual Databases Exceeds 70%

As mentioned above, databases are divided into two types: reference databases and factual databases. In recent years, factual databases tend to outnumber reference databases, since production of full-text databases has been raised dramatically. This in turn ensues technical innovation and cheaper storage media (see Table 2-3).

Until 1985, reference databases counted for more than half of the total, but was exceeded in 1986 by the number of factual databases, and the gap has increased ever since (see Figure 2-6).

In 1990, 74.7% of the total were factual databases, leaving reference databases at 25.3%. Note that factual/reference databases are listed as factual. Full-text or near-full-text databases mark 48% or almost half of the total volume (see Figure 2-7).

(5) Online Japanese Databases are on the Rise

By media, databases are divided into two types: online databases, provided via networks, and offline (batch) databases, stored on media such as magnetic tape or CD-ROM. Online access is still of major preference, although databases stored on CD-ROM, being cheaper and more user-friendly, are becoming more popular.

The 1990 edition of "Database Directory" reveals that 2,910 of the total number of databases are being offered online, while 336 are provided offline. In other words, close to 90% of all databases, and as much as 99% of all foreign databases, are provided online. As many as 73% of all Japanese databases are offered online; however, a significant number are available offline.

Until 1989, only the "business" exceeded an online provision ratio of 70%. In 1990 though, online provision of the databases in the "general" and "natural science/technology" exceeded 70% (See Table 2-4).

1.4 Comparison between the Japanese and the U.S. Databases

Since there are not yet any internationally

**Table 2-3 Transition of No. of Databases by Data Type
(No. of Registered Databases, 1982-1988)**

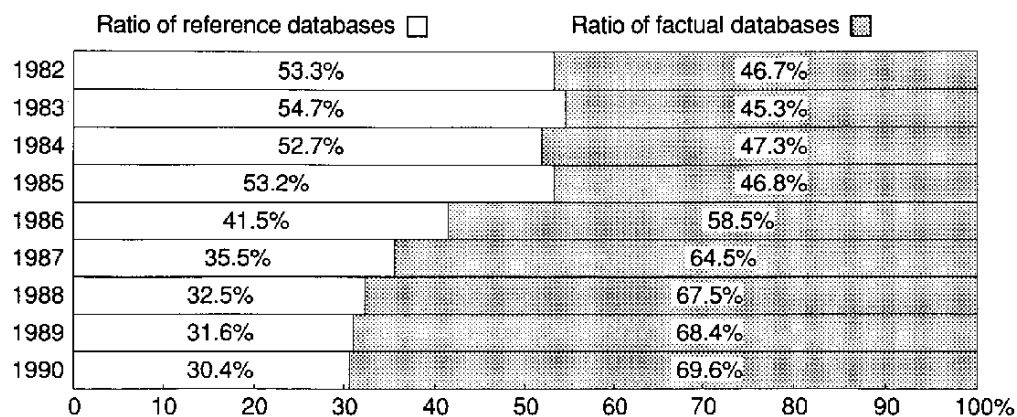
Type of data	1982	1983	1984	1985	1986	1987	1988	1989		1990	
								Regis.	Actual	Regis.	Actual
Reference											
Document information											
Bibliography	92	133	173	202	194	210	205	227	148	251	166
Abstract	10	11	47	112	211	236	230	253	178	247	180
Bibliography/ abstract	171	286	353	421	369	388	451	462	248	477	250
Others	49	71	81	171	—	—	—	—	—	—	—
Total of reference	322	501	654	906	774	834	886	942	574	975	596
Fact											
Full-text information											
Full-text	52	66	180	313	503	593	754	837	718	1,178	1,007
Combination of full-text and others	39	49	72	102	113	193	255	290	184	328	204
Numeric	130	229	207	239	389	616	689	719	424	510	323
Combination of numeric, graphics, and application	61	71	129	142	88	110	140	195	130	216	138
Total of factual databases	282	415	588	796	1,093	1,502	1,838	2,041	1,456	2,232	1,672
Others	—	—	—	—	92	94	134	113	98	106	86
Total	604	916	1,242	1,702	1,959	2,440	2,858	3,096	2,128	3,313	2,354
Ratio of reference databases	53.3%	54.7%	52.7%	53.2%	41.5%	35.5%	32.5%	31.6%	28.3%	30.4%	26.3%
Ratio of factual databases	46.7%	45.3%	47.3%	46.8%	58.5%	64.5%	67.5%	68.4%	71.7%	69.6%	73.7%

Note1: As a form for self-assessed tax payment altered in 1986, classification for type of data was partly revised.

Note2: Ratios from 1986 on are calculated excluding others.

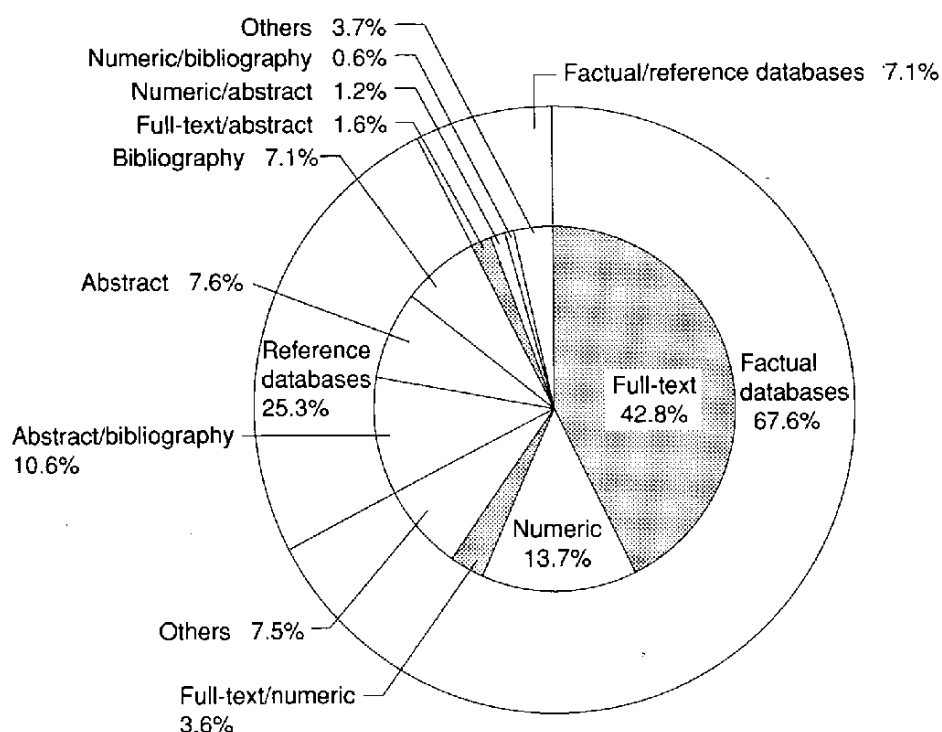
Note3: Ratios before 1988 are for the number of registered databases.

Source: "Database Directory," MITI



Source: "Database Directory," MITI, October 1991

Figure 2-6 Transition of No. of Registered Databases by Data Type



Source: "Database Directory," MITI, October 1991

**Figure 2-7 By-type Distribution of Databases Available in Japan
(Actual No. of Databases)**

**Table 2-4 Online Japanese and Foreign Databases by Category
(No. of Registered Databases, 1990)**

Category	Japanese			Foreign			Total		
	Online	Offline	Online ratio	Online	Offline	Online ratio	Online	Offline	Online ratio
General	248	91	73.2%	464	13	97.3%	712	104	87.3%
Natural science/ technology	95	37	72.0%	861	7	99.2%	956	44	95.6%
Humanities	1	21	4.5%	111	0	100.0%	112	21	84.2%
Business	476	155	75.4%	645	11	98.3%	1,121	166	87.1%
Others	5	1	83.3%	4	0	100.0%	9	1	90.0%
Total	825	305	73.0%	2,085	31	98.5%	2,910	336	89.6%

Note1: "Online" includes databases used for both the online and offline categories.

Note2: All files are not entered into the online and offline categories.

Consequently, the sum of databases is not 3,313, which is the actual number of files (e.g., gateway, via information brokers).

Source: "Database Directory," MITI

accepted definitions or classifications of databases, it might be difficult to strictly and correctly compare Japanese and U.S. databases. However, through comparison with U.S. databases, that are quite superior, the present stage of development of Japanese databases can be made clear.

In this section we will compare two features, namely industry size and the characteristics of distributed databases. This will shed some more light on the database situation in Japan and the U.S.

The following four criteria are used in comparing the sizes of the respective database industries in Japan and the U.S.:

1. The number of participating organizations
2. The number of producers
3. The number of passwords
4. Total database sales

In comparing the characteristics of the databases being distributed, the following four criteria are used:

1. The number of distributed databases
2. The number of domestic databases
3. The number of business databases
4. The number of factual databases

(1) Comparing Industry Size

Compared by size, the markets in Japan and the U.S. are very different. For example, as many as 1,500 organizations are in some way related to the U.S. database industry, whereas the number of organizations in Japan reaches 200. In the U.S., the number of producers totals 1,350, to be compared with that of only 123 in Japan (see Figure 2-8).

The U.S. data is based on the 1991 edition of "The State of Databases Today," compiled under the supervision of Professor Martha E. Williams of the University of Illinois. The Japanese figures are cited from the 1990 edition of "Database Directory."

Distributors issue passwords, or IDs, in order to give users access to databases. The number of passwords distributed in the U.S. is 2.1 million, to be compared to the 240,000 passwords distributed in Japan. Some users hold more than one password; therefore, the number of passwords does not equal the number of users, but provides only a rough approximation.

The data on the number of passwords in the U.S. is derived from "Nikkei New Media" (the November 25, 1991 issue). The magazine regularly publishes this type of password ranking in a section called the "IDP Report." This figure, as of January 1, 1991, excludes the number of passwords for PC network systems, videotex, and Computerized Reservation Systems (CRSs) from the grand U.S. total of 4,250,000; this exclusion is done for the purpose of comparing the situation in Japan with that of the U.S. on the same basis. The number of U.S. passwords also includes passwords issued by distributors to overseas users, widening the gap between the Japanese and the U.S. markets. In other words, a large number of overseas users search U.S. databases.

According to LINK, U.S. database sales totaled US\$9.5 billion in 1990. As for Japan, database sales amounted to ¥190 billion, according to the "Survey of Selected Services Industries."

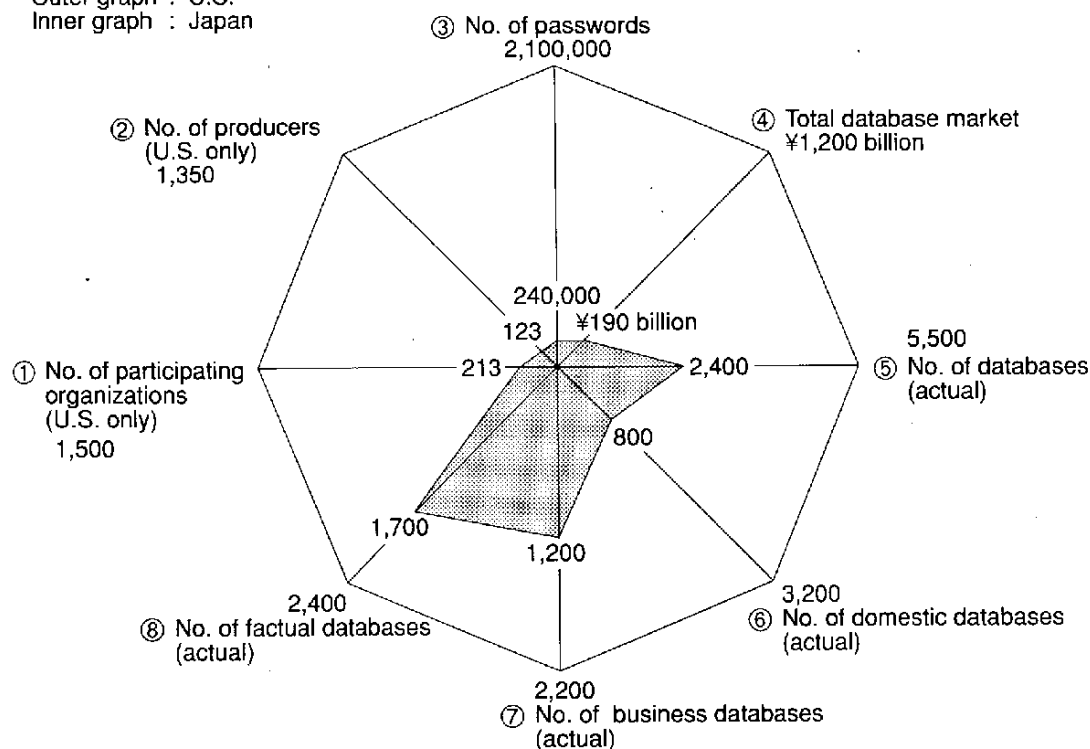
As seen above, the U.S. is far ahead of Japan when it comes to database sales; U.S. total sales are six times that of the Japanese database industry, and there are eleven database producers in the U.S. to every producer in Japan.

(2) Comparing the Characteristics of Distributed Databases

The characteristics of Japanese and U.S. databases are very similar, since most of the databases available in Japan are produced in the U.S.

There are 5,500 databases available in the U.S., whereas 2,400 databases can be accessed in Japan. As for the ratios of databases in the "business" and factual databases, the differences are insignificant; in Japan, the number of available U.S. "business" databases amounts to 3,200, while that of factual databases is 800. Since there are so many more producers in the U.S. than in Japan, comparing the characteristics by ratio shows a small gap of 1:1.4 in the number of factual databases, and 1:4 in the number of domestic databases (See Table 2-5).

Outer graph : U.S.
Inner graph : Japan



Note 1: ①, ②, ⑤-⑧ for the U. S., summed up and analyzed from the data in "The State of Databases Today," Prof. Martha E. Williams, 1991. The numerals are approximate.

Note 2: ①, ②, ⑤-⑧ for Japan, "Database Directory," MITI, 1990

Note 3: ③ for the U. S., "Nikkei New Media," Nikkei BP, Nov. 25, 1991. The numerals are exclusive of the number of PC network service, Videotex and CRS.

Note 4: ③ for Japan, "Nikkei New Media," Nikkei BP, July 29, 1991

Note 5: ④ for the U. S., estimated from data obtained from LINK Resources Corp. and calculated at ¥125/US\$. The numeral is approximate.

Note 6: ④ for Japan, "Survey of Selected Service Industries," MITI, 1990

Figure 2-8 Comparison between the Japanese and the U. S. Database Situation (1990)

Table 2-5 Comparison between the Japanese and the U.S. Databases (1990)

Criteria	Japan	U.S.
No. of participating organizations	1	7.0
No. of producers	1	11.0
No. of passwords	1	8.8
Total database sales	1	6.3
No. of distributed databases	1	2.3
No. of domestic databases	1	4.0
No. of business databases	1	1.8
No. of factual databases	1	1.4

2. Trends of the Database Service Industry

2.1 The Structure of Database Service Industry

(1) Classification of Database Service Industry

Companies providing database service industry are divided into several types of business by activity: producers, vendors, agents, gateway companies, information brokers, etc.

Literally, producers are companies that create or produce databases. They are located at the most upstream position of the database distribution chain, and function as indicators of the basic capacity of the database service industry.

Vendors are companies that provide users with the databases created by the producers. They function as online suppliers, administering host computers and networks.

Agents are agencies that handle copyright-related matters for producers, and handle database sales promotion and retail for vendors.

Gateway companies supply mainly network services for users to enable them to use various databases by connecting vendors with each other.

Information brokers are also called agent

searchers. They search databases in accordance with customer demands, and supply value-added services.

Some database service industry companies specialize in only one of the services mentioned above, while others are active in multiple types. Dedicated companies provide only one type of service, while others provide more than one type of database service industry.

According to the classification of 213 replying companies in the "Database Directory," issued in 1990, producers/vendors rank first at 28.6% (61 companies) of the total, followed by dedicated information brokers at 22.1%, and dedicated producers at 13.1% (see Table 2-6).

(2) Distribution System

There is a series of distribution levels, such as production, supply, and utilization, before the information reaches end users via databases. Each database service industry is concerned directly with either of these levels.

On the other hand, some companies support this distribution system indirectly. For example, various manufacturers provide equipment and software required for database production. Nor should software

Table 2-6 Comparison of the Business Types of Database Service Industry

Business types	Companies registered in the "Database Directory"	
	No. of companies	Ratio
Producers	28	13.1 %
Vendors	14	6.6
Information brokers	47	22.1
Agencies	7	3.3
Producers/vendors	61	28.6
Producers/vendors/agencies	7	3.3
Producers/vendors/information brokers	8	3.8
Information brokers/agencies	6	2.8
Others	35	16.4
Total	213	100.0

Source: "Database Directory," MITI, October 1991

vendors familiar with DBMS or telecommunication software be overlooked. Further, common carriers provide vendors with various network infrastructure. In other words, the database distribution system consists of many types of companies in the information industry.

To establish a distribution system, the role of each company should be distinguished by emphasizing their individual advantages. This distinction, at the same time, helps to disperse the risks of the industry. For example, producers are concerned directly or indirectly with the data source, and can well handle the procedures of database production, which includes collection, analysis, and input of data. Vendors, however, that retain large-scale computers can better handle global data supply through the use of networks.

From this point of view, it is necessary for each company to specialize in one single database service industry and thus establish a specialization system. In the U.S., the database service industry has already seen the establishment of such specialization systems and well-defined distribution systems. As shown above, in Japan the number of companies specializing in several business types is high, and few new companies enter this industry.

Figure 2-9 shows several patterns of the database distribution system.

2.2 The Situation of Database Service Industry

DPC every year conducts a survey called the "Survey on User Awareness on Database Service industry-Vendors" in order to grasp the situation of the database service industry. "Databases in Japan" is based on this survey.

The latest survey was conducted in September 1991, by sending inquiries to 213 companies that had replied to the "Database Directory" issued in 1990. Of these, 143 replies (67.1%) were used as a basis for the survey.

The next section is a closer look at the situation of the database service industry in Japan, based on an analysis of this survey.

(1) Attributes of the Replying Companies

1) Industrial Categories

Of the 143 replying companies, 56.6% (81 companies) were involved with data processing and information service—the highest ratio in this survey. In other words, more than half of all the database service industry companies are active in the information service industry. This type was followed by "other business-to-business" services, such as "think tank/ broadcast/ telecommunication" services, at 14%, and other manufacturers including the "printing/ publishing/newspaper industry" at 11.9% (see Figure 2-10).

Considering how the data processing and

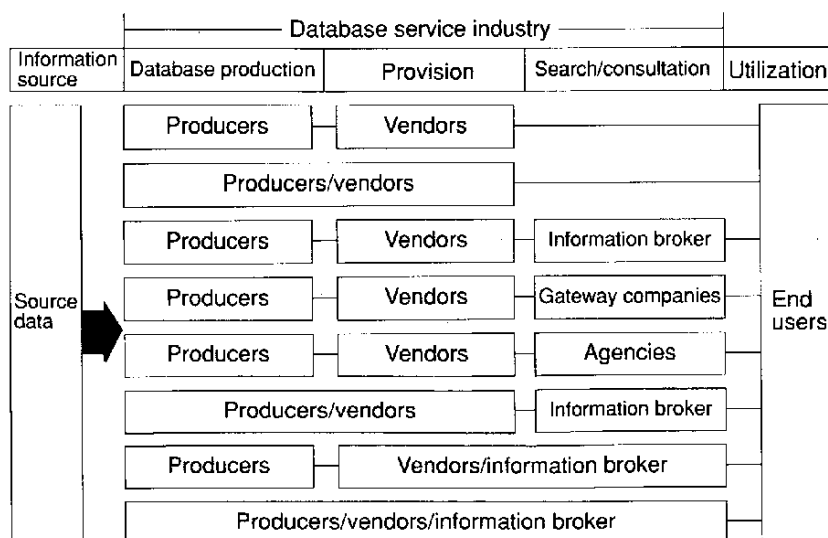
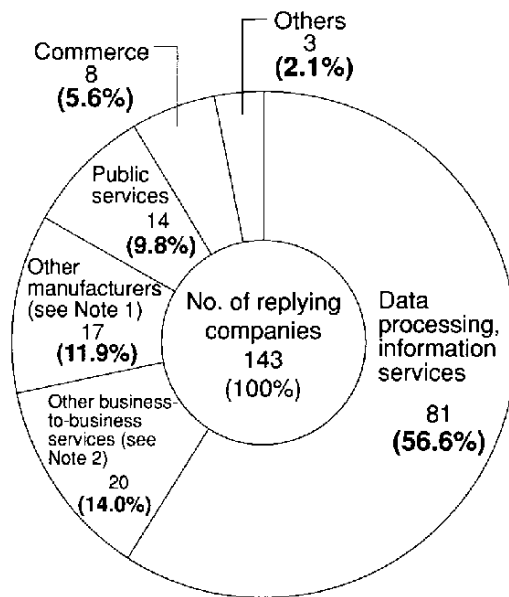


Figure 2-9 Distribution System of Databases



Note 1: "Other manufacturers" include the industries of food, fiber/paper pulp, glass/clay products, printing, publishing, and newspapers.

Note 2: "Other business-to-business services" include real estate, transport/warehouse, electric power/gas, broadcast/telecommunication, think tank, advertising, and other services.

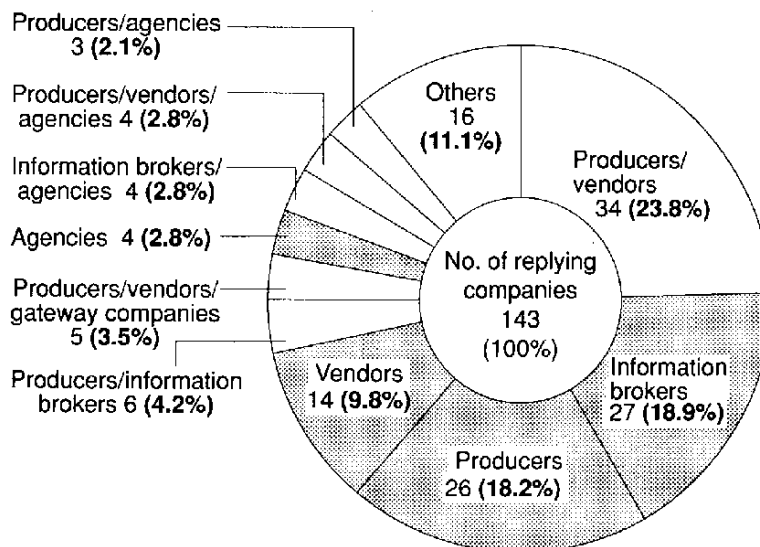
Figure 2-10 Industrial Categories of the Companies Replying to the Survey

information services industry has entered the database industry, the various services offered by this type are quite dispersed and varied. For example, among these 81 companies, 20 are producers/vendors, 17 are dedicated information brokers, 11 are dedicated producers, while 6 are dedicated vendors.

2) Services

Among the 143 repliers, producers/vendors occupy the highest ratio at 23.8% (34 companies), followed by dedicated information brokers at 18.9%, dedicated producers at 18.2%, and dedicated vendors at 9.8%.

Almost half of all the companies that have entered the database industry are dedicated to one type of database service industry. When allowing companies to be counted as both dedicated one business type and engaged several business types through multiple replies, we find that 87 companies are "producers/vendors," 71 are dedicated "vendors," 15 are dedicated gateway companies, and 46 are dedicated "information brokers" (see Figure 2-11).



Note: Sectors marked with shaded patterns indicate the company specializing in one business type, whereas the unmarked sectors indicate the company engaged in several business types. One reply in the "Others sector" is, however, a company specializing in gateways.

	No.
1. Producers	87
2. Vendors	71
3. Gateway companies	15
4. Information brokers	46
5. Agencies	23

Figure 2-11 Distribution of Business Type among the Companies Replying to the Survey of Database Services

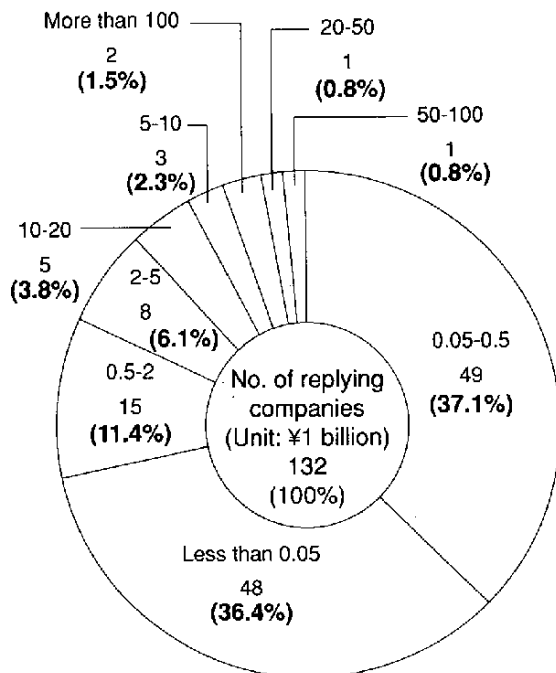
3) Others (capital, annual sales, number of employees)

As shown in Figure 2-12, among the 132 repliers, 49 companies (37.1%) retained a capital in the range of ¥0.05-0.5 billion, followed by 48 companies (36.4%) with a capital of less than ¥50 million.

According to capital by business type, producers/vendors come out on top at an average of ¥33 billion, followed by dedicated agencies and dedicated vendors, at respective averages of ¥20 billion and ¥16 billion. Companies that have entered the industry in these forms are typically large companies that provide database service industry as a part of the business activity.

On the other hand, the average retained capital of dedicated producers and dedicated information brokers are as small as ¥2 billion and ¥38 million, respectively.

Considering the annual sales of 126 of the replying companies, 23.8% of the companies



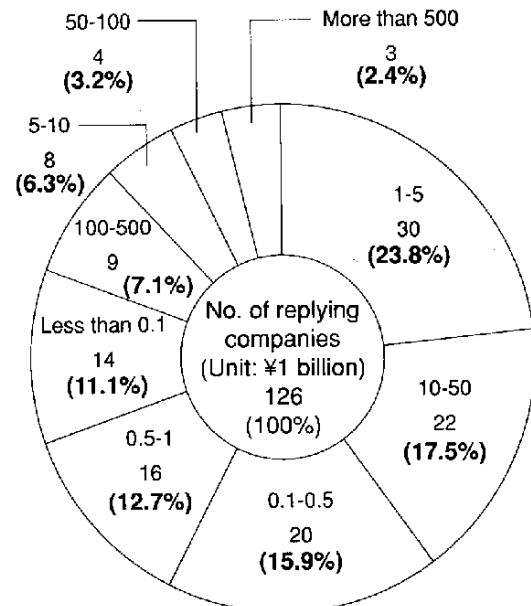
Note: As for not-for-profit organizations, capital means funds or money invested.

Figure 2-12 Distribution of the Capital of the Companies Replying to the Survey

retain annual sales in the range of ¥1-5 billion, followed by 17.5% in the range of ¥10-50 billion, and 15.9% in the range of ¥0.1-0.5 billion (see Figure 2-13). Mind that the annual sales described here do not exclusively refer to sales of database service industry, but to company gross annual sales.

According to business type, agencies retain the largest annual sales, followed by dedicated vendors and producers/vendors. This comparison encompasses database service industry provided by large companies, a tendency which can also be seen in Figure 2-12.

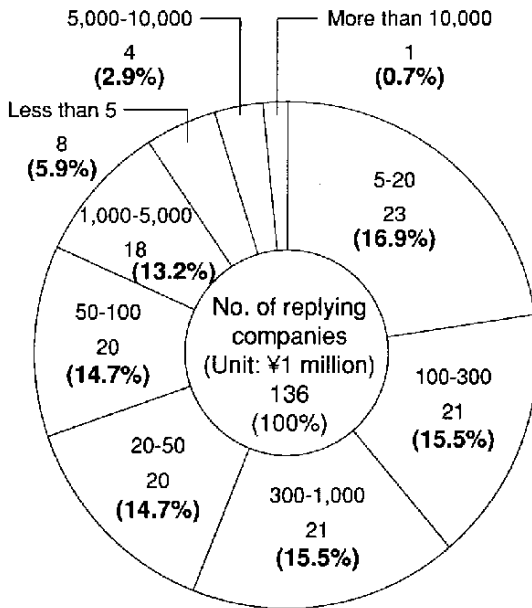
Figure 2-14, the pie chart containing employee



Note: Annual sales of banks, insurance, securities companies and not-for-profit organizations mean the balance of deposit, contract amount, incomings, and annual expenses, respectively.

Figure 2-13 Distribution of the Annual Sales of the Companies Replying to the Survey

information, indicates imbalance. This clearly shows a tendency of the industry; some companies commence business as information brokers with a small number of employees, while quite a few large companies incorporate database service industry as a part of the business activity.



Note: As for schools, it is the number of full-time teachers, and for government offices, the number of public servants of departments that is concerned here.

Figure 2-14 Distribution of Employees of the Companies Replying to the Survey

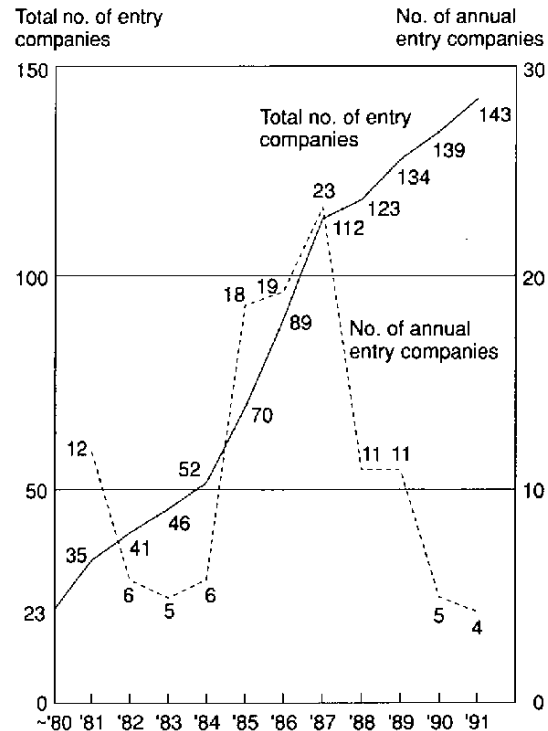
(2) Entering into the Database Industry

Figure 2-15 gives the year of entry for the 143 replying companies, and the transition of the total number of entries into the database industry. Among these 143 repliers, only 23 companies (16%) entered prior to 1980. Thus, entry into the database industry has accelerated since 1980, with a peak around 1985-87, when 60 of the surveyed companies entered into the industry.

For your reference, Figure 2-16 shows the transition of companies registered in the "Database Directory."

(3) Positioning of Database Service Industry

Figures 2-10 show the industrial categories of the replying companies. According to these charts, there are many entries into the database industry from various industrial categories, such as data processing and information service. Shown here is whether or not these companies look upon database service industry as their major business. However, the survey does not



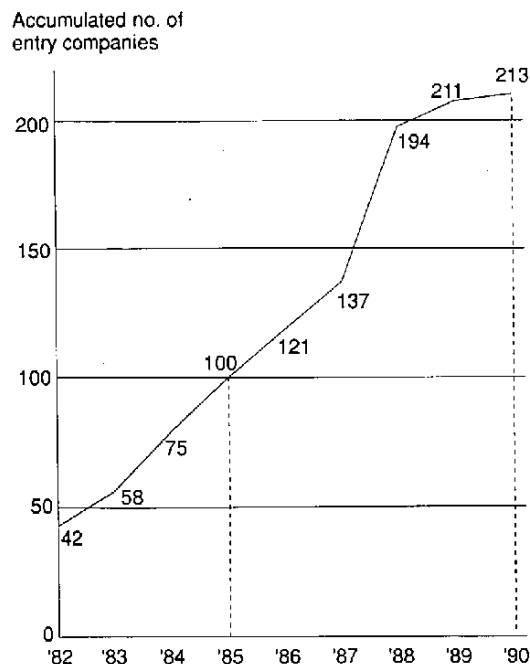
Note 1: No. of companies entering in 1991 is calculated as of September 1991.

Note 2: In case one company has entered several business types, the earlier entry is recorded here.

Figure 2-15 Annual No. of Entries into the Database Industry

contain a clear definition of "major business," e.g., meaning that "database sales constitute more than half of total sales." Therefore, the replying companies have interpreted this in various ways; some companies define their database service industry as the major part of their business, while others are considering the future possibilities of database service industry.

Even though some room must be left for future speculation, 41.9% of the 141 surveyed companies presently regard database service industry as a major part of their business. In the previous survey, this ratio for the first time exceeded the 40%. In this survey, the ratio was maintained and raised. Of these companies, 59.6% believe database service industry to remain their major field of business in the future. This implies that the industry still holds high expectations for the database service industry (see Figure 2-17).



Source: "Database Directory", MITI

Figure 2-16 Transition of Companies Registered in the "Database Directory"

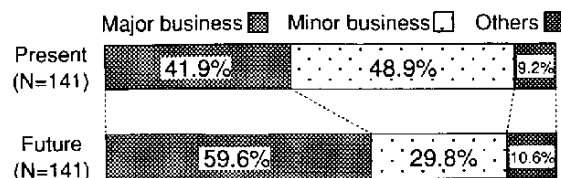
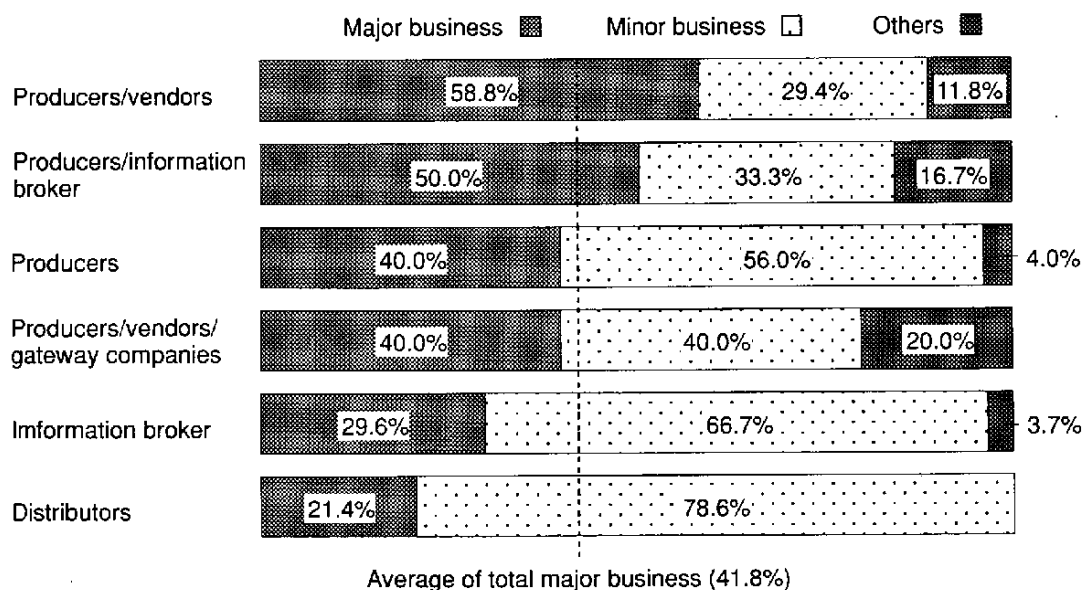


Figure 2-17 Positioning of Database Services

In positioning database service industry by business type, producers/vendors retain the highest ratio, both presently and in speculations about the future. Apart from this type, only dedicated producers and dedicated information brokers exceeded the total average (see Figures 2-18 and 2-19).

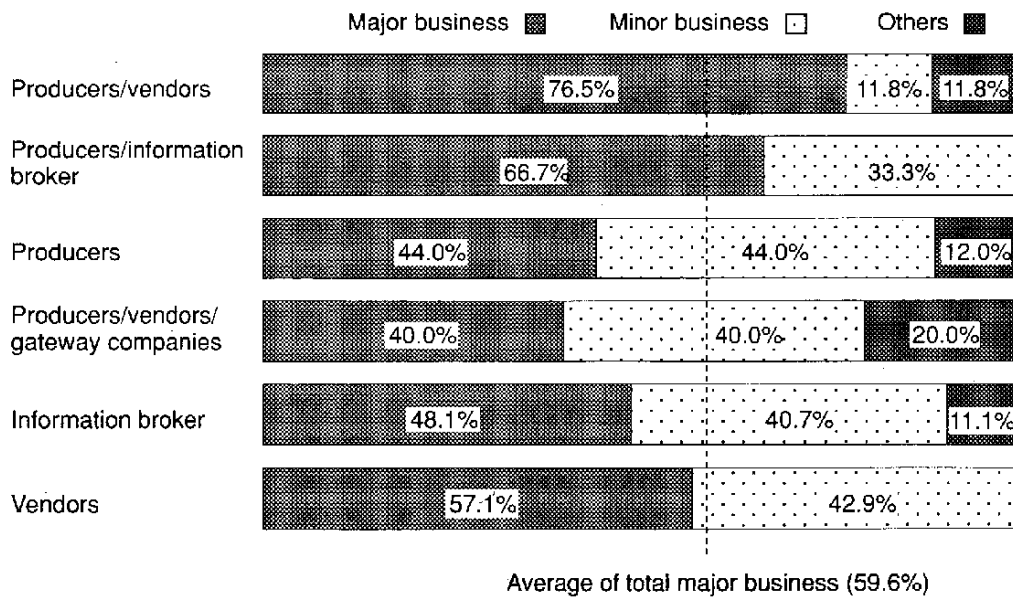
(4) The Sales of Database Service

It is difficult to define exactly what amount of total sales to attribute to database service industry, as they are usually provided as a part of the business activity. In the following section, we will use four comparisons to review how database service industry are positioned as types of business:



Note: Analyzed for five or more replies

Figure 2-18 Current Positioning of Database Services (N=144)



Note: Analyzed for five or more replies

Figure 2-19 Future Positioning of Database Services (N=144)

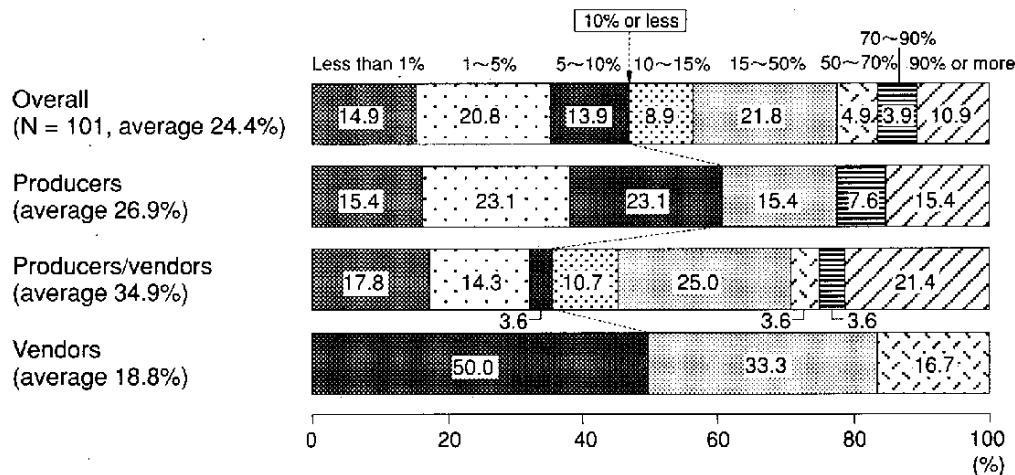


Figure 2-20 Distribution of the Ratio of Database Sales of Gross Sales

- 1) Ratio of database service industry sales of company gross annual sales
- 2) Expected growth rate of database sales (annual average growth rate for the next five years)
- 3) Ratio of Japanese database sales of total database sales
- 4) Ratio of online service sales of total database sales.

When viewing the ratio of database sales of gross sales, the average for 101 of the replying companies is 24.4%. However, as there is a considerable gap among database service industry companies, it may be

easier to grasp the situation by disregarding overall figures, and viewing it by business type.

Among these 101 companies, 14.9% of them retain database sales of less than 1% of their gross sales, while sales are in the range of 1-5% for 20.8% of the companies, and 13.9% of them retain a ratio of 5-10%. Together, these three types occupy almost half of the total. From this point of view, database service industry are still a small part of overall business in Japan.

By business type, companies both of producers and vendors make up for 34.9% of database sales, the

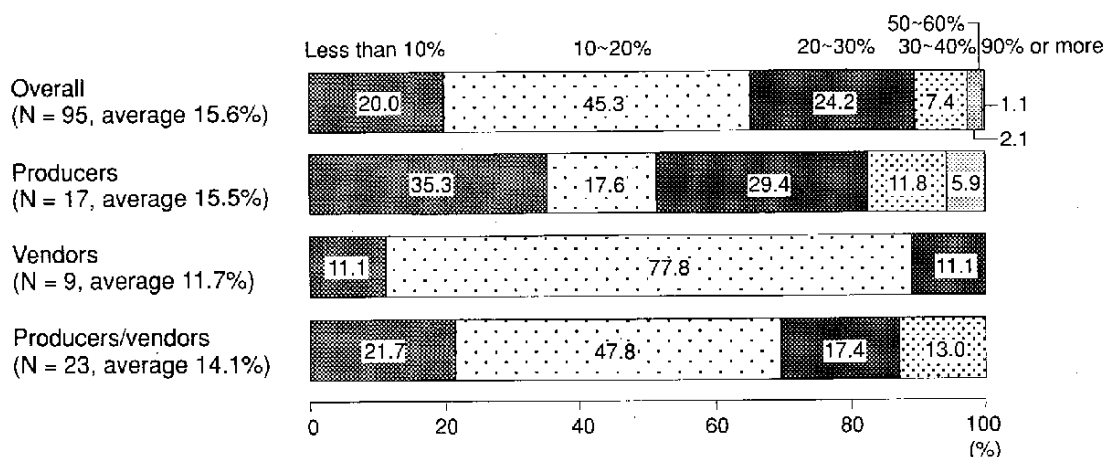


Figure 2-21 Expected Annual Average Growth Rate Distribution of Database Sales for the Next 5 Years

highest ratio of all business types. On the other hand, 61.6% of all dedicated producers retain a ratio of database sales of less than 10% of their gross sales (see Figure 2-20).

According to 95 of the surveyed companies, the annual average growth rate of database sales projected for the next five-year period is a reasonable 15.6%. The growth rate for the period of 1989-90, according to the "Survey of Selected Service Industries," was 19.7%.

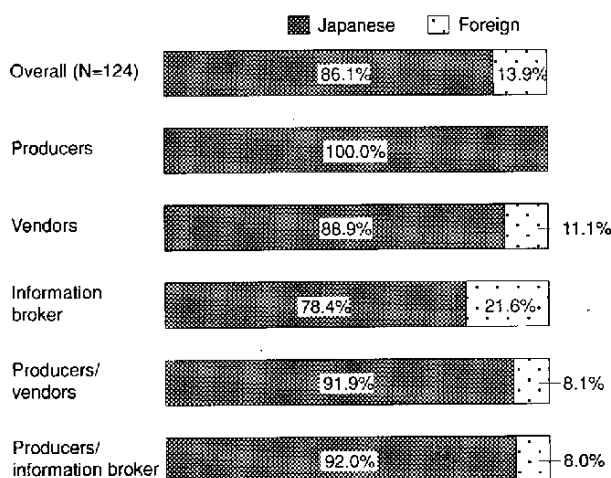
By business type, dedicated producers and dedicated vendors showed annual average growth rates of 15.5% and 11.7%, respectively (see Figure 2-21).

The third comparison, viewing the ratio of Japanese database sales of total database sales, is high; it makes up for 86.1% of the total for 124 of the replying companies. In other words, sales of Japanese databases occupy an overwhelmingly higher ratio than that of foreign databases, a trend that has prevailed for a consecutive number of years. The sales ratios of Japanese databases for the last three years have been 83%, 84%, and 87%, respectively. Thus, this is the fourth consecutive year that this ratio has exceeded 80%.

By business type, disregarding the ratio of 100% for dedicated producers, producers/vendors and dedicated vendors occupy ratios as high as 91.9% and 88.9%, respectively. This indicates that utilization of Japanese databases has become mainstream, although the number of available foreign databases is large. In

other words, it cannot be said that Japanese end users depend upon information from abroad (see Figure 2-22).

The fourth comparison, viewing the ratio of



Note: Analyzed for five or more replies

Figure 2-22 Ratio of Japanese Databases of Total Database Sales

online service sales of total database sales, evidently shows that online services have become mainstream both for Japanese and foreign databases. At 79.9%, especially foreign databases rely heavily on online access. Viewing foreign products other than online databases, magnetic tape (MT) and CD-ROM occupy 4.5% and 3.2%, respectively. For Japanese databases, online databases occupy 59.9% of total sales, while

MT and CD-ROM make up for 13.7% and 5.4%, respectively, which indicates diversified supply when compared to foreign databases (see Figure 2-23).

(5) Ratio of Database Production Costs

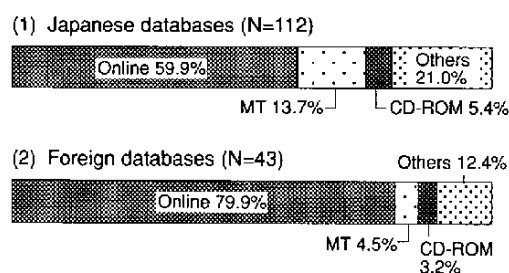


Figure 2-23 Ratio of Database Sales by Media

The expenses of database production cost, include those expenses that are related to actual production activities such as data gathering, data analysis/processing, and data entry. The expenses for software development activities such as programming and system designing, as well as those for using computers and for making manuals, are also included in this database production cost.

According to 59 of the replying companies, the three highest ratios of the total production cost are input (22.4%), data collection (22%), and analysis and processing (15.9%). These three activities are directly related to production (see Figure 2-24).

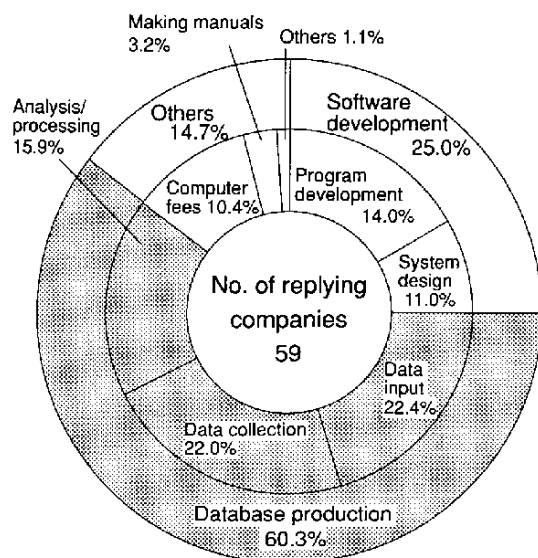


Figure 2-24 Ratio of Database Production Cost (Average of Total)

In this survey, the questionnaire for the first time included inquiries on the ratio of production cost by type of database. The replies indicate that for text database, the ratio of the production cost increases for activities such as collection, analysis and processing, and input. These answers disregard reference (bibliography/abstracts) and factual (full-text) databases. On the contrary, for factual databases based on numerical data, costs for development of software, such as program development and system design, tend to increase (see Figures 2-25, 2-26, and 2-27).

(6) Problems with Database Production

In viewing problems encountered by producers for the production of databases, factors related to costs have ranked high every year. In this survey, 89.6% of the replying companies made an issue of high costs required for production, including data collection and input. This factor occupied the highest production cost ratio, as shown in the previous section.

The replying companies also pointed out problems such as heavy post-production maintenance costs, huge investments, and difficult recovery. This obviously shows that producers suffer problems with costs (see Figure 2-28).

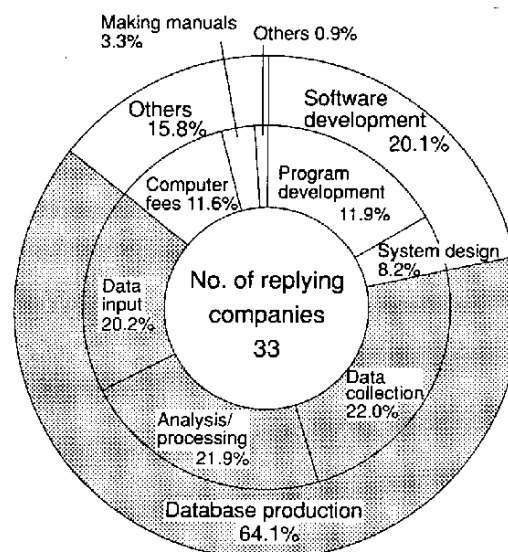


Figure 2-25 Ratio of Database Production Cost in Reference Databases (Text)

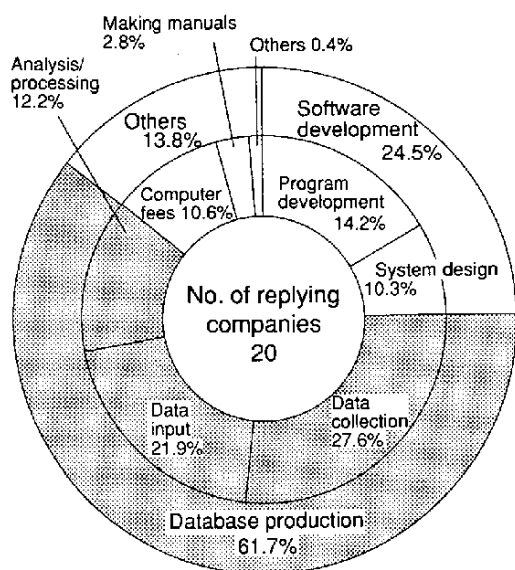


Figure 2-26 Ratio of Database Production Cost in Factual Databases (Full-Text)

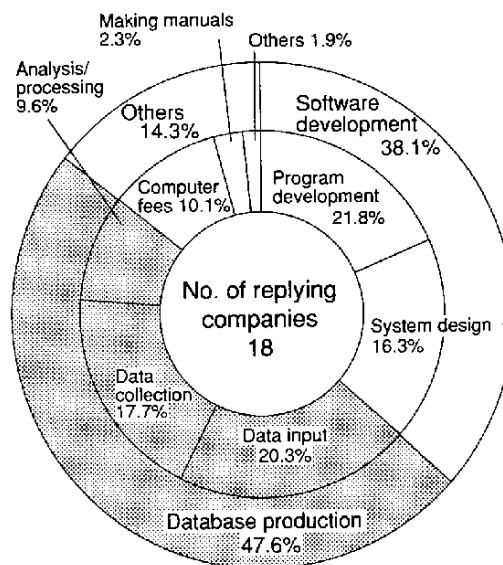


Figure 2-27 Ratio of Database Production Cost in Factual Databases (Numerical)

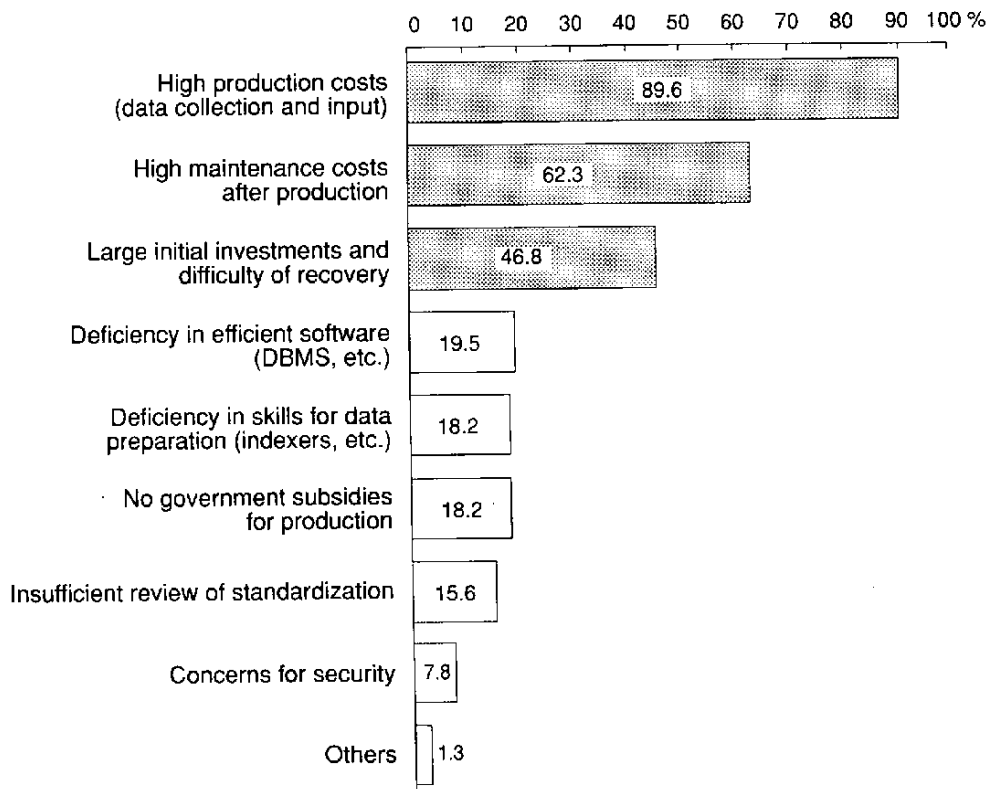


Figure 2-28 Problem Factors Involved with Database Production (N=77: Multiple Replies)

(7) Distribution Methods

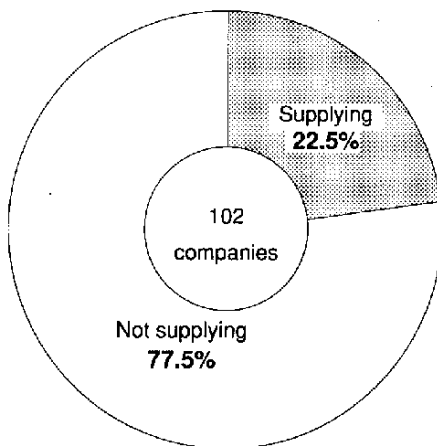
When producers distribute databases for users, they either sell databases themselves, or they entrust sales to a vendor. As mentioned above, however, in establishing specialization systems, producers should concentrate on the production of database rather than vendors.

However, producers actually often sell their databases themselves. For example, 63 replying producers (78.8%) out of 80 answered that they sell their databases themselves. However, distribution is diversified so that 18 producers entrust sales to another (single) company, while 17 producers entrust two or more other companies (see Table 2-7).

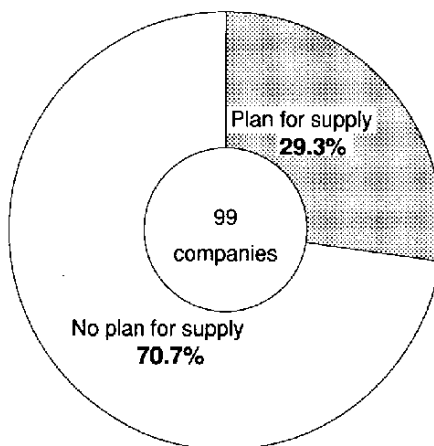
Table 2-7 Database Distribution Method by Producers (N=80: Multiple Replies)

	No. of DBs	Ratio (%)
Self-service	63	78.8
Supply to another (single) company	18	22.5
Supply to two or more other companies	17	21.3

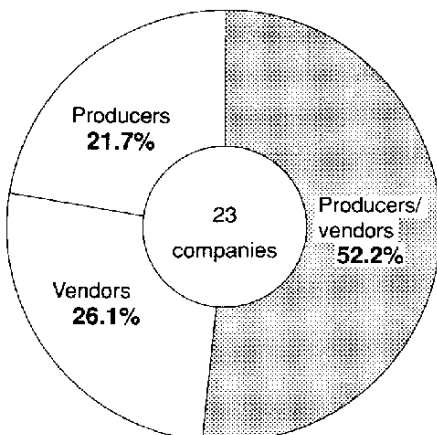
(1) Present State of Overseas Supply



(3) Plan for Overseas Supply



(2) Business Types of Overseas Supply



(4) Business Types Planned for Overseas Supply

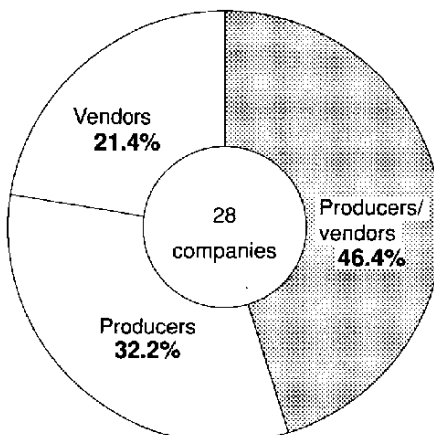


Figure 2-29 Overseas Database Supply and Positioning

(8) **The Situation of Overseas Supply**

1) The current situation and future prospects of overseas supply

Presently, among 102 replying companies, 23 (22.5%) supply databases to foreign countries on certain conditions (see Figure 2-29-(1)). By business type, producers/vendors occupy the highest ratio at 52.2% (see Figure 2-29-(2)).

In the future, 29 companies (29.3%) out of 99 plan to extend database service industry

overseas (see Figure 2-29-(3)). Producers/vendors retain the highest ratio at 46.4% (see Figure 2-29-(4)).

2) Categories covered by databases to be supplied (see Table 2-8)

As for the categories for which databases will be provided for foreign countries, the 24 replying companies through multiple replies selected "business" with 78 replies, followed by the "general" at 46 replies. In subcategories,

Table 2-8 Categories and Collecting Areas Scheduled for Overseas Database Supply (N=24, Multiple Replies)

Collecting area Category	No. of replies	U.S.		EC		Asia		[Former U.S.S.R., Eastern Europe, China		Others		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
General													
General (encyclopedia/bibliographic information/book guide)	3	3	37.5	3	37.5	2	25.0	0	0.0	0	0.0	8	100.0
Newspaper/journal/news	6	6	37.5	5	31.3	5	31.3	0	0.0	0	0.0	16	100.0
Who's who/organizations	3	2	33.3	1	16.7	3	50.0	0	0.0	0	0.0	6	100.0
Administration/law/politics	3	3	50.0	1	16.7	2	33.3	0	0.0	0	0.0	6	100.0
Information on living	3	2	33.3	1	16.7	3	50.0	0	0.0	0	0.0	6	100.0
Others	2	1	25.0	1	25.0	2	50.0	0	0.0	0	0.0	4	100.0
Subtotal	9	17	37.0	12	26.1	17	37.0	0	0.0	0	0.0	46	100.0
Natural science and technology													
Patent	2	1	25.0	1	25.0	2	50.0	0	0.0	0	0.0	4	100.0
Medicine/pharmaceutics/ biotechnology/biology	4	4	40.0	4	40.0	2	20.0	0	0.0	0	0.0	10	100.0
Others	2	2	40.0	2	40.0	1	20.0	0	0.0	0	0.0	5	100.0
Subtotal	6	7	36.8	7	36.8	5	26.3	0	0.0	0	0.0	19	100.0
Humanities	1	1	33.3	1	33.3	1	33.3	0	0.0	0	0.0	3	100.0
Business													
Corporate finance/profile	8	8	36.4	7	31.8	5	22.7	2	9.1	0	0.0	22	100.0
Macro-economy	4	4	33.3	4	33.3	3	25.0	1	8.3	0	0.0	12	100.0
Marketing	8	8	38.1	6	28.6	6	28.6	1	4.8	0	0.0	21	100.0
Finance/securities/foreign exchange	7	7	35.0	5	25.0	6	30.0	1	5.0	1	5.0	20	100.0
Others	1	1	33.3	1	33.3	1	33.3	0	0.0	0	0.0	3	100.0
Subtotal	12	28	35.9	23	29.5	21	26.9	5	6.4	1	1.3	78	100.0
Others	2	2	25.0	2	25.0	2	25.0	1	12.5	1	12.5	8	100.0
Total	24	55	35.7	45	29.2	46	29.9	6	3.9	2	1.3	154	100.0

popular categories are "corporate finance/profile"/"marketing," and "finance/securities/foreign exchange."

Concerning the areas to be covered, the U.S. ranks first at 35.7% (55 repliers), followed by the EC and Asia at approximately 30% each.

3) Problem factors involved with overseas supply

Concerning problems involved with overseas supply, more than half of the replying companies pointed out the following: (1) high translation costs, (2) difficulty of understanding needs, and (3) setting up sales networks. Believing that translation costs are high is a tendency that has surfaced since the survey before last, indicating raised expectations on machine translation (see Figure 2-30).

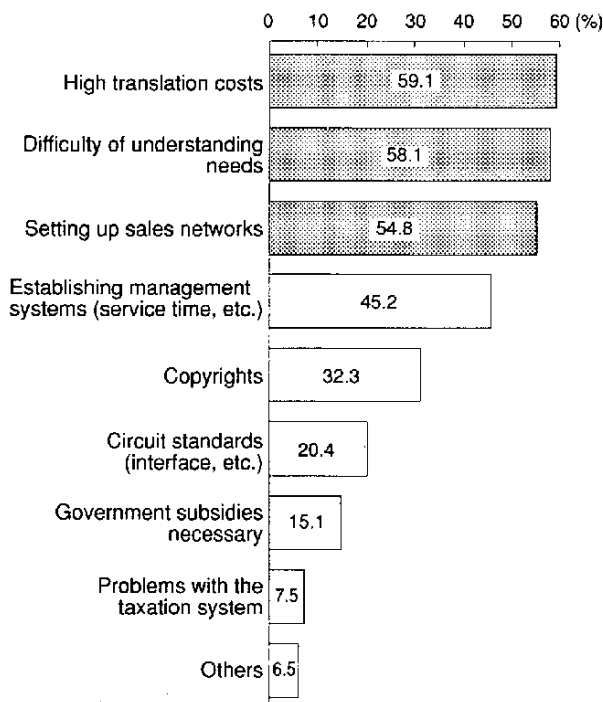


Figure 2-30 Problem Factors Involved with Overseas Database Supply (N=93, Multiple Replies)

(9) The Situation of CD-ROM as Delivery Media

1) Supply

At present, among 101 repliers, 25 companies (24.8%) supply databases in the form of CD-ROM. This survey shows an increase from the

survey of last year representing 20%, approximately 5 points up (See Fig 2-31).

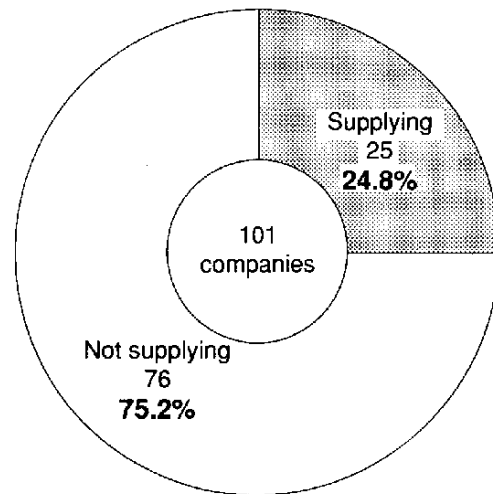


Figure 2-31 CD-ROM Database Supply State

2) Category of information by CD-ROM

Presently, 25 replying companies supply 43 databases in the form of CD-ROM. The top two categories are the "general" and "business" which include 18 and 15 databases, respectively. In subcategory, the "bibliography/publications" include as many as 6 CD-ROM databases, followed by the "newspaper/journal articles," which includes 5 databases.

On the other hand, concerning types planned for future expansion, as many as 70 databases are being planned for production by 33 companies. The replies show that the two major types planned for expansion are the "general" and "business," with huge growth planned for the former. In subcategories "newspaper/journal articles" includes 12 CD-ROM databases, followed by the "cyclopedia/dictionary/encyclopedia/directory" and the "medicine/pharmaceutics/biotechnology/chemistry" at as many as 7 databases each (see Table 2-9).

Table 2-9 Current State of CD-ROM Databases, Future Schedule

Category	Supplying (N=25)	Scheduled in future (N=33)
[General]	18	33
Audio visual/game/entertainment	—	2
Service guide	—	1
Cyclopedia/dictionary/encyclopedia/directory	4	7
CAI	—	2
Bibliography/publication	6	3
Who's who	2	5
Newspaper/Journal articles	5	12
Navigation	1	1
[Business]	15	22
Finance/securities/foreign exchange/market	2	2
Corporate finance/profile	4	4
Economy/business	2	6
Commodities/products	2	2
Maps/mapping/phone no./address code	1	4
Statistics/demography	1	3
Laws/codes/judicial precedents/tax and tax administration	3	1
[Natural science/technology]	8	10
Medicine/pharmaceutics/biotechnology/chemistry	5	7
Science and technology/patent	2	2
Computer/software	—	1
Material/raw material	1	—
[Humanities]	2	4
Education/religion	—	1
Art/culture/literature/history	1	1
Language/terminology	—	1
Library/information science	1	1
Others	—	1
Total	43	70

(10) Future Problems

As mentioned above, producers pointed out high costs for production, etc. as their biggest problem. Apart from this, we asked all of the surveyed database service industry companies about future problems related to business development.

More than half of the replying companies pointed out that (a) the value of information not acknowledged (56.1%), and (b) bring up talented person (54%). They are basic problems in providing database service industry. In addition, reduction of production costs and operational costs also ranks high (see Figure 2-32).

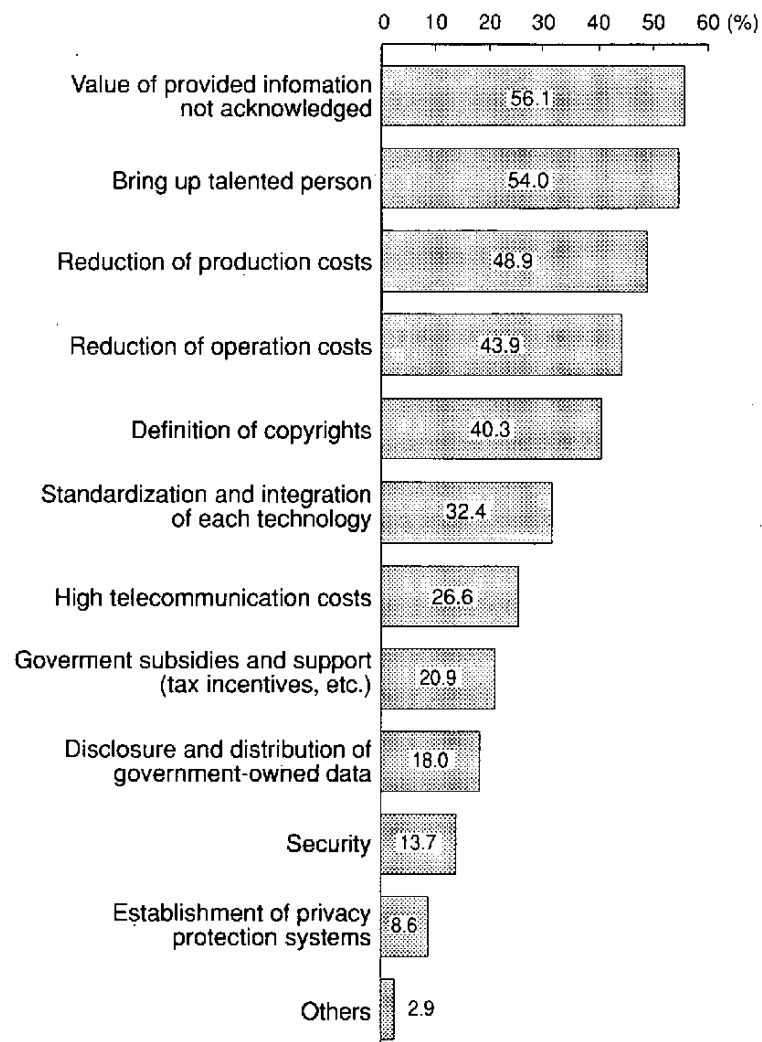


Figure 2-32 Future Problems Involved with Database Services (N=139, Multiple Replies)

III. THE USE OF COMMERCIAL DATABASES

1. The Current State of Utilization

1.1 Outline of Survey and Methodology

In order to gather information on such issues as how commercial databases are being used in our country, what problems they present from the user's point of view, and how the user's awareness of them is changing, the Database Promotion Center, Japan (DPC) every year conducts a survey entitled the "Survey of User Awareness of Database Services." The 1991 inquiry was carried out from September to October, 1991, by addressing a questionnaire to 2,526 Japanese organizations including business firms, educational institutions, and public entities. 774 answers were received (30.6% collected).

The replies to the questionnaire were analyzed by aggregating them on the basis of the following three criteria:

- (1) the size of the organization as measured by the number of employees (see Table 3-1),
- (2) the industrial category classified into eleven groups (see Table 3-2), and

- (3) the location of the replying companies (whether or not in the metropolitan area including Tokyo, Chiba, Saitama, and Kanagawa prefectures).

As shown in Table 3-3, the respondents to the questionnaire are broken down by company size into small and medium-size businesses (16.7% of the total), large companies (64.7%), and public services (18.6%); by location into metropolitan area (60.6%) and others (39.4%); by industrial category into "data processing and information services" (15.8%), "oil/chemistry" including drug pharmaceuticals (12.4%), and "other manufacturers" (11.1%). The so-called secondary industries comprising all manufacturers represent 42.5%, and the tertiary industries excluding public services 37.7%.

66.4% of the respondent organizations are "currently using" databases. By company size, this is 57.4% of the small and medium-size businesses and 70.5% of the large companies. By industry, more than 70% of the "oil/chemistry" (89.6%), "other manufacturers" (74.4%), "electric/machinery/transport equipment" (72.4%), and "other business-to-business services" (72.2%) are database users.

Table 3-1 Standard Classification of Company Size Based on the Number of Employees

Category	Small/medium	Large	Public service
Mining, manufacture, transport, and others (construction, medicine, electric, chemistry, and metal industries)	Less than 300	More than 301	
Retail and service industries (finance, securities, insurance, real estate, electric, oil, and information processing services)	Less than 50	More than 51	
Wholesale	Less than 100	More than 101	
Public service (schools and other educational institutes, research and development facilities, cooperations and other associations, government and local authorities)			

Note: The standard classification is the number of employees according to the Small and Medium Enterprise Basic Law.

Table 3-2 Classification by Industrial Category

Category	Common classification
1. Construction	Same as left
2. Oil/chemistry	Pharmaceuticals, oil, chemistry
3. Iron and steel/non-ferrous/metal	Iron and steel, non-ferrous metal, metal
4. Electric, machinery, transport equipment	Electric equipment, transport equipment, machinery and precision equipment
5. Other manufacturers	Food, fiber/paper/pulp, glass and clay/stone, printing/publishing, newspaper, and others
6. Commerce	Same as left
7. Finance, insurance	Finance, securities, insurance
8. Data processing, information services	Same as left
9. Other business-to-business services	Real estate, transport/warehouse, electric power, oil, broadcast/communication, think tank, advertising, and other services
10. Public service	Schools and other educational institutes, hospitals and other medical clinics, research and development facilities, cooperations and other associations, government and local authorities
11. Others	Agriculture, forestry, fisheries, mining, and others

Note: The classification is based on the Japan Standard Industry Classification.

Table 3-3 Outline of Replying Companies

Utilization state Replying companies	No. of replies (%)	Users		Non-users	
		No.	%	No.	%
By size					
Small/medium	129 (16.7)	74	57.4	55	42.6
Large	501 (64.7)	353	70.5	148	29.5
Public service	144 (18.6)	87	60.4	57	39.6
By category					
Construction	38 (4.9)	26	68.4	12	31.6
Oil/chemistry	96 (12.4)	86	89.6	10	10.4
Iron and steel, non-ferrous, metal	33 (4.3)	19	57.6	14	42.4
Electric, machinery, transport equipment	76 (9.8)	55	72.4	21	27.6
Other manufacturers	86 (11.1)	64	74.4	22	25.6
Commerce	54 (7.0)	21	38.9	33	61.1
Finance, insurance	37 (4.8)	25	67.6	12	32.4
Data processing, information services	122 (15.8)	67	54.9	55	45.1
Other business-to-business services	79 (10.2)	57	72.2	22	27.8
Public service	144 (18.6)	87	60.4	57	39.6
Others	9 (1.2)	7	77.8	2	22.2
By region					
Metropolitan area	469 (60.6)	330	70.4	139	29.6
Others	305 (39.4)	184	60.3	121	39.7
Total	774	514	66.4	260	33.6

Note: (): Percentage composition by size, industry, and region

The following sections of this chapter discuss how commercial databases are currently used and looked upon, based on the analysis of this survey.

2. The Current State and Future Prospects of Database Utilization

2.1 The Number of Database Vendors Used and Database Vendors Subscribed to

Table 3-4 shows, in the form of a frequency distribution table, the number of database vendors that the respondents to the survey questionnaire are currently using. By company size, the per organization average of the number of database vendors used is 5.2 in the case of small and medium-size businesses, 7.0 in the case of large companies, and 3.7 for public services. For small and medium-size businesses, the greatest frequency falls in the class of "using 4 vendors," representing 21.1% of the total, and the accumulation of the classes of "4 vendors" and below constitutes 61.9%. In the case of large companies, on the other hand, the greatest frequency falls in the class of "using over 10 vendors" (24.7% of the total) and the second greatest in the classes of "1 vendor" and "6 to 9 vendors" (both 17.8%). For all respondents combined, the average number of database vendors used is 6.1; the greatest frequency falls in the class of "over 10 vendors" (20.1%) and the second greatest in "1 vendor" (18.0%).

A by-industry analysis reveals a more distinct tendency of polarization. The industrial categories having the greatest frequency in the "over 10 vendors" is the "oil/chemistry," using 10.2 vendors on average.

In contrast, the respondents in the "commerce," showing the least frequency in the "over 10 vendors," are using 2.9 vendors on average; 44.4% of them are using only 1 vendor. These results could be interpreted as an indication that there are very few large-scale distributors who can comprehensively meet the diversifying business needs of the users.

The average number of contracted vendors that the respondents subscribe to is 5.0 on an all-combined basis, 4.4 for the small and medium-size businesses, 5.5 for the large companies, and 3.3 for the public services. The accumulation of the frequencies in the classes of "3 vendors" and below represents as much as 48.9% of the total, while those in the "over 10 vendors" as little as 13.3% (Figure 3-1). As expected, the number of contracted vendor subscriptions is high in the "finance/insurance" and "oil/chemistry"; with around 28% of each of these industrial categories subscribing to more than ten vendors.

2.2 Annual Usage Costs for Database

Table 3-5 shows the by-company-size averages of the 1990 results and the 1991 usage cost plans of the respondents for their usage of commercial databases. The ratio of the 1990 usage costs for Japanese database services vs those for foreign ones is approximately 73:27, indicating dominant use of Japanese services. Meanwhile, the 1990 edition of MITI's "Database Directory" reports that 1,546 foreign commercial databases and 808 Japanese ones are available in Japan, underlining the continuation of the inverse relationships of the usage ratio and availability ratio of Japanese and foreign databases.

Table 3-4 Distribution of Number of Vendors Used by Company Size

Company size \ No. of vendors	No. of replies	1		2		3		4		5		6-9		10 or more		Average of vendors
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Small/medium	71	13	18.3	11	15.5	5	7.0	15	21.1	9	12.7	7	9.9	11	15.5	5.2
Large	332	59	17.8	40	12.0	39	11.7	28	8.4	25	7.5	59	17.8	82	24.7	7.0
Public service	85	16	18.8	26	30.6	13	15.3	4	4.7	9	10.6	12	14.1	5	5.9	3.7
Total	488	88	18.0	77	15.8	57	11.7	47	9.6	43	8.8	78	16.0	98	20.1	6.1

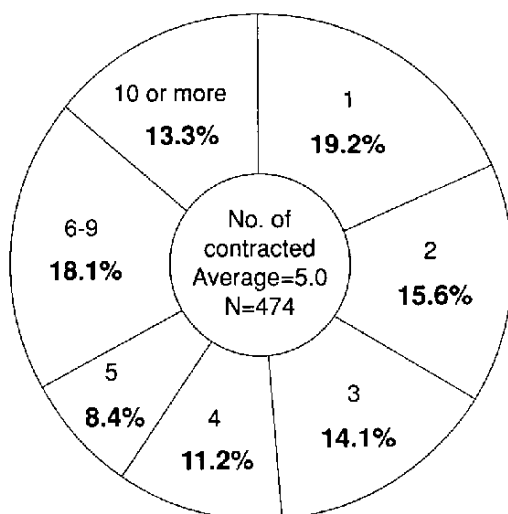


Figure 3-1 Number of Contracted Vendors

The per-company average of the 1990 total database usage costs is ¥3.3 million for small and medium-size businesses and ¥44.9 million for large companies, the latter being 13.5 times that of the former. However, the prospects for 1991 show that the large companies expect an increase in their usage costs at an average rate of 4.7%, whereas the small and medium-size businesses are more active expecting an average rate of 14.1%.

Looking at the averages of the 1990 figures by industrial categories, the "finance/insurance" runs far ahead of the others, spending ¥345.4 million per company. Following this are "data processing and

information service," spending ¥36.8 million, "other manufacturers" ¥24.0 million, and "oil/chemistry" ¥14.1 million. As regards the origin of the databases, only companies in the "oil/chemistry" spent more money for overseas database services than for Japanese ones. The highest ratio of usage costs for Japanese databases vs that for foreign ones is seen in the "data processing and information services" (approx. 34:1), and next in "construction" (22.5:1), "commerce" (13:1), and "other manufacturers" (10.9:1).

Figure 3-2 shows the by-company-size distribution of the respondents in ranges of database usage costs. Of the small and medium-size businesses, the largest portion, 20.3%, falls in the cost range of ¥1-2 million per year (nearly ¥80,000 per month). The range of ¥2-5 million, which contains the overall average, represents 15.6% of the total, and the ranges of less than ¥5 million together represent 86.0%.

As regards the large companies, the largest portion, 20.1% falls in the range of ¥2-5 million. The range of ¥1-2 million represents 15.1%, and the range of ¥500,000-1 million 12.8%. Although the overall average is approximately ¥44.9 million, the total ratio of the corresponding range and the higher ones is as low as 14.7%, suggesting a small minority of companies pushing up the average through frequent usage.

Table 3-5 Annual Average Usage Costs for Database by Company Size

(Unit: ¥10,000)

Company size	Actual result of 1990 (N=435)			Scheduled for 1991 (N=422)		
	Japanese databases	Foreign databases	Total	Japanese databases	Foreign databases	Total
Small/medium	235.0 (70.9)	96.3 (29.1)	331.3	272.7 (16.0)	105.4 (9.4)	378.1 (14.1)
Large	3,284.0 (73.2)	1,204.1 (26.8)	4,488.1	3,470.6 (5.7)	1,227.3 (1.9)	4,697.9 (4.7)
Public service	125.4 (73.2)	45.9 (26.8)	171.3	135.3 (7.9)	55.1 (20.0)	190.4 (11.2)
Average	2,305.3 (73.1)	846.7 (26.9)	3,152.1	2,448.2 (6.2)	868.3 (2.6)	3,316.5 (5.2)

Note: Parenthesized ratios showing the actual results of 1990 indicate a gap between Japanese and foreign databases, whereas those showing the scheduled results for 1991 indicate growth rates.

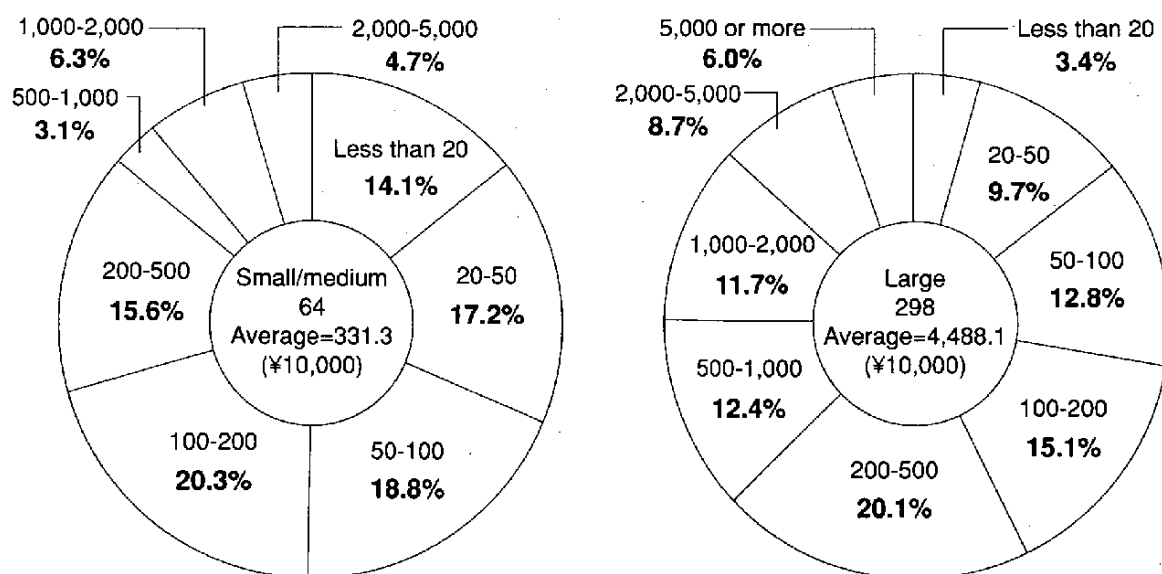


Figure 3-2 Annual Usage Costs of Actual Result of 1990 by Company Size

2.3 Analysis by Company's Section

Table 3-6 shows how much money various sections of the replying companies in each industrial categories spend for commercial databases. On an average across the industrial categories, "development" sections are the prime users, spending 24.7% of the accumulation of the usage costs. Following these are "research" (21.2%), "patent" (13.3%), "planning" (11.1%), and "sales" (9.8%) sections. This proportion

is nearly the same as that found in the previous survey.

When viewed by industrial categories, the proportion varies somewhat. In the secondary industries, "development" and "patent" sections are the prime users. In fact, the development sections of the "oil/chemistry" and the patent sections of the "electric/machinery/transport equipment" both spend more than 40% of their respective totals. What is interesting here is that the usage cost of the "construction" is more by

Table 3-6 Utilization by Section for Each Industrial Category

Category	Utilization section	No. of replies	Planning (%)	Research (%)	Development (%)	Patent (%)	System development (%)	Production (%)	Sales (%)	General affairs (%)	Others (%)
Construction		25	19.6	9.1	31.7	7.0	6.4	2.0	19.5	0.4	4.5
Oil/chemistry		76	6.1	16.0	40.8	19.5	0.6	1.5	9.7	0.8	5.0
Iron and steel, non-ferrous, metal		18	3.5	8.3	37.5	33.6	0.3	3.3	6.1	7.1	0.3
Electric, machinery, transport equipment		50	9.0	8.3	28.9	40.4	1.6	3.5	3.6	1.8	2.8
Other manufacturers		57	12.5	14.0	33.0	14.8	4.1	3.5	9.4	1.0	7.6
Commerce		18	28.3	15.0	8.9	3.9	5.0	0.0	28.3	6.1	4.4
Finance, insurance		21	4.3	25.2	5.7	0.0	0.0	4.8	24.4	3.7	31.9
Data processing, information service		58	9.1	35.5	4.2	8.7	7.0	2.0	16.2	5.9	11.4
Other business-to-business services		52	19.6	26.6	12.8	1.6	2.0	2.7	6.7	7.4	20.6
Public service		75	8.7	34.1	26.9	3.7	0.1	1.3	0.3	1.3	23.7
Others		6	11.7	13.3	28.3	4.2	4.5	0.8	15.8	7.2	14.2
Total		456	11.1	21.2	24.7	13.3	2.5	2.3	9.8	3.1	11.9

such sections as planning and sales than by patent, reflecting the main areas of the activities in the category.

In the tertiary industries, the main users of commercial databases are the research and sales sections, as is typically the case for the "finance/insurance" and "data processing and information services." In the "other business-to-business services," however, sales spends only 6.7%, while research section spends more.

3. The Types and Contents of Most-Used Commercial Databases

3.1 Most-Used Database Vendors and Database Files

In the questionnaire, the repliers were asked to list the 3 database vendors they pay the most for. Table 3-7 is a rating based on the frequency of listing of each database vendor. The most used is JOIS (listed by 238 repliers), followed by Nikkei Telecom (193), PATOLIS (188), DIALOG (182), STN (60), etc. The top five vendors have kept their positions for several years, and a large portion of the listings are Japanese vendors.

A by-company-size analysis shows that JOIS, STN, and G-Search are more used by small and medium-size businesses than by large companies. The top three are JOIS (52.2%), PATOLIS (39.1%), and DIALOG (37.7%) for large companies, and JOIS (44.9%), PATOLIS (44.6%), Nikkei Telecom (40.2%).

Also, an industrial categories analysis suggests some differences in the user base of such systems as JOIS, PATOLIS, and DIALOG. For instance, the average ratio of JOIS utilization is as high as 59.2% for secondary industries, but as low as 26.4% for tertiary industries. The same is true of PATOLIS, with an average as high as 62.5% for secondary industries, but as low as 16.0% for tertiary industries. Nikkei Telecom, on the other hand, is more generally used, with an average of 29.6% for secondary industries and 49.1% for tertiary industries.

Similar to the vendor rating in Table 3-7, Table 3-8 shows a rating of database files, based on the frequency of listing by the questionnaire repliers. As can be seen from the table, the highest-listing files are in line with the highest-listing vendors.

Table 3-7 Highly Utilized Vendors, According to Number of Replies (N=496, Multiple Replies)

Order in 1990	1991		Name of systems
	Order	No. of replies	
1	1	238	JOIS
4	2	193	Nikkei Telecom
3	3	188	PATOLIS
2	4	182	DIALOG
5	5	60	STN
	6	33	G-Search
6	7	30	NEEDS-IR
8	8	23	COSMOS
10	8	23	NICHIGAI-ASSIST
	10	21	ELNET
10	10	21	TSR
12	12	20	DIALINE
9	13	16	BRANDY
12	13	16	QUICK Video-1
	15	12	NEEDS-TS
	

Note: Aggregate of top three vendors of utilization from each replier.

Table 3-8 Files with High Utilization Frequency (N=425, Multiple Replies)

Order in 1990	1991		Databases
	Order	No. of replies	
1	1	211	JICST File on Science and Technology
2	2	177	Nikkei Newspaper article file
3	3	172	Japan patent utility model file
4	4	82	WPI
7	5	72	Trademark file
9	6	71	MEDLINE
5	7	70	CA-SEARCH
8	8	63	CA
5	9	62	Asahi Newspaper article database
	10	57	Nikkei General Economic File
10	11	50	JICST File on Medical Science in Japan
14	12	43	BIOSIS
11	13	41	CLAIMS
	14	40	REGISTRY
	15	37	Nikkei Financial data
	

3.2 Online Database Utilization Ratio

Databases are used in one of the following three ways:

- 1) Online database services alone,
- 2) Online/offline database services combined, or
- 3) Offline database services alone.

For these, the survey this time obtained a ratio of 48.8%, 49.6%, and 1.6%, respectively. The growth rate is -5.8% for 1), 9.0% for 2), and -40.7% for 3). This result would indicate that more users are choosing between online and offline depending on the frequency and amount of their use. Using a combination of 1) and 2) is up 1.1% from the previous year.

3.3 Database Utilization by Time

Table 3-9 shows the monthly per-company average of the amount of time the replying companies in each size category have used and expect to use online database services. For all the respondents combined, the average of the amount of time they spent on online database services in 1990 is 59.1 hours per month, and the average of the amount of time they expect to spend on online database services in 1991 is 64.8 hours per month. These figures can further be broken down, in the case of the 1990 results into 45.7 hours for using Japanese databases and 13.4 hours for foreign ones, with the former being as much as 77.3% of the total amount of time. For 1991, the respondents expect an increase of nearly 10% in their usage of both

Japanese and foreign database services.

By company size, the average of the 1990 results is 31.1 hours for the small and medium-size businesses and 75.5 hours for the large companies. This situation, the latter being approx. 2.4 times that of the former, is nearly the same as for the 1991 prospects. In short, the proportion of utilizing Japanese vs foreign databases in terms of the amount of time the user spends using them is not very different for the small and medium-size businesses and large companies, and is practically the same as that in terms of the money the user spends on them.

The two pie charts in Figure 3-3 show the distributions of the respondents, categorized into small and medium-size businesses (on the left) and large-size companies (on the right), according to the monthly average of the amount of time they spend on online database services. The largest portion of the small and medium-size businesses, 38.3%, use online database services for 1-5 hours per month, whereas the ratio within the large companies varies greatly for the time spent on online database service usage, resulting in relatively even sectors in the chart.

Analyzed by industrial categories, these figures present some characteristic features; namely, that "finance/insurance" surpasses the other industrial categories considerably with an average of 186.7 hours, and that companies in the "commerce," "construction," and "iron and steel, non-ferrous metal,

Table 3-9 Annual Average Utilization Hours per Company by Company Size (Online Only)

Company size	Actual result of 1990 (N=372)			Scheduled for 1991 (N=367)		
	Japanese databases	Foreign databases	Total	Japanese databases	Foreign databases	Total
Small/medium	23.7 (76.2)	7.4 (23.8)	31.1	25.0 (5.5)	9.2 (24.3)	34.2 (10.0)
Large	58.0 (76.8)	17.5 (23.2)	75.5	62.3 (7.4)	18.4 (5.1)	80.7 (6.9)
Public service	19.7 (84.9)	3.5 (15.1)	23.2	25.1 (27.4)	4.7 (34.3)	29.9 (28.9)
Average	45.7 (77.3)	13.4 (22.7)	59.1	50.1 (9.6)	14.7 (9.7)	64.8 (9.6)

Note: Parenthesized ratios showing the actual results of 1990 indicate a gap between Japanese and foreign databases, whereas those showing the scheduled results for 1991 indicate growth rates.

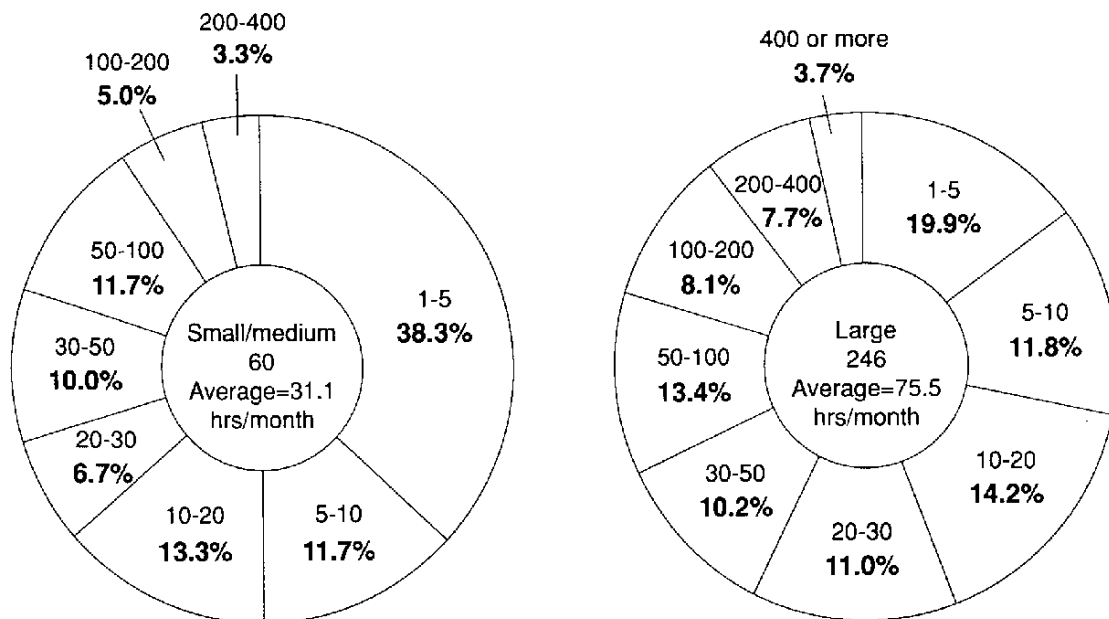


Figure 3-3 Distribution of Monthly Database Utilization Hours (Online) by Company Size (N=306)

metal manufacturing" do not use foreign databases much. Actually, the ratio at which the companies in the "commerce" use Japanese databases vs the amount of time that this industrial category spends on foreign databases is approx. 30:1. It is also interesting that all industrial categories except the "oil/chemistry" use Japanese databases more than foreign ones. The companies in the "oil/chemistry" use databases of both makes more or less evenly.

3.4 Contents of Information Gathered from Commercial Databases

Figure 3-4 is an analysis of the replies to the questionnaire as to what kinds of information they obtain through commercial databases. As can be seen from the chart, Japanese databases are used as sources of "newspaper/journal articles" (77.3%), "corporate (finance/credit)" (59.0%), "bibliography on journal articles" (57.7%), etc., while foreign databases are used as sources of "bibliography on journal articles"

(69.0%), "patent" (57.4%), "newspaper/journal article" (49.6%), etc. Each category shows an increased ratio

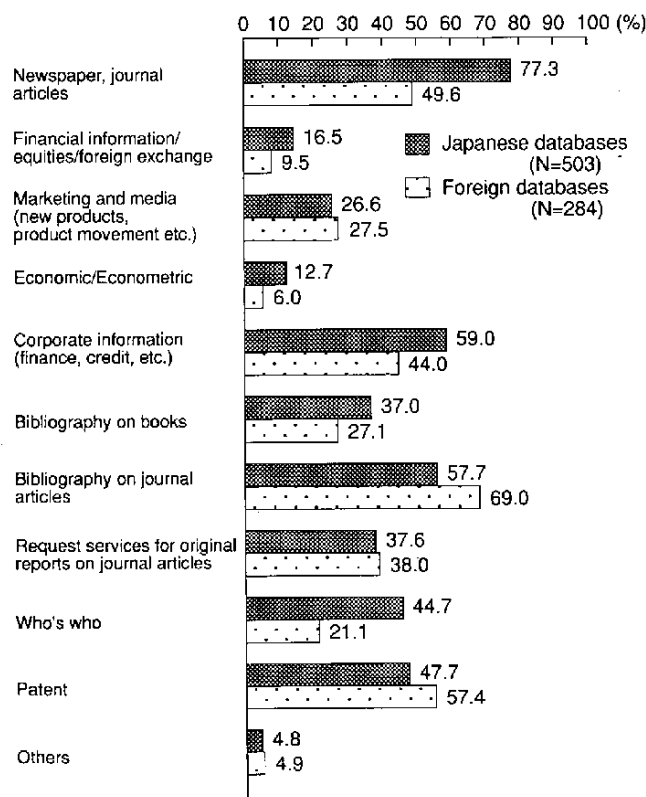


Figure 3-4 Information Categories Available from Commercial Databases

from the previous survey, indicating diversification of information needs of the user. Especially, the "request services for original reports on journal articles" and "patent" both show an increase of about 10%.

4. The Utilization of Online Database Services

4.1 How Online Database Services are Used

The most common way of using online database services is to display the results of retrieval on terminals and print them out as needed. An absolute majority, 90.7%, of the 492 surveyed organizations, are using online database services this way. However, this figure is slightly lower than that of the previous survey, and there are small increases for utilization such as "to download and process the results" and "to store the results in in-house databases for later use." This would indicate that users have become more accustomed to the idea of using online database services in different ways in accordance with different circumstances.

4.2 Terminals and Modem

Table 3-10 shows the types of terminals, as well as the classes and the speed of modems, that the respondents use for their data retrieval activities. This time, the category "PC" is separated into desktop PCs and portable PCs including laptops and notebook PCs. 395 companies use desktop PCs while 119 use portables. This would indicate that with improved portability of modems and other hardware as well as

enhanced operability of communications software, users prefer computers that provide access just when and where he or she needs them.

Figure 3-5 charts how many of the respondents to the last three years' surveys have used each of the four modem speed classes. For public circuits, the most-preferred speed is 1,200 bps, used by around 80% of the respondents. The number of 300 bps users are declining, while that of 2,400 bps users is increasing steadily. For private circuits, although little change has been seen in terms of preferred modem speeds over these three years, it is clear that more users are using private circuits in combination with public circuits.

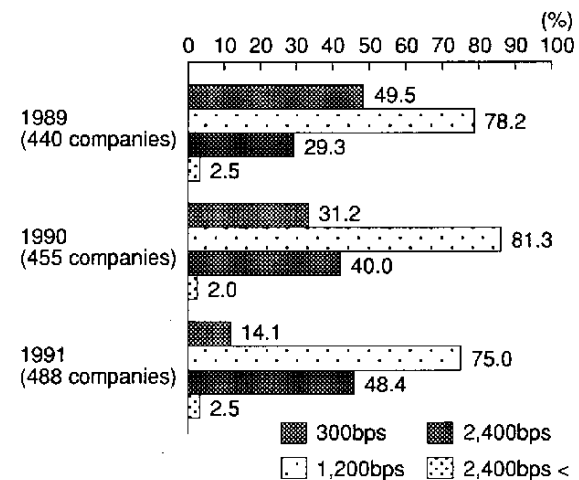


Figure 3-5 Speed of Modems Used by Public Circuits (Multiple Replies)

Table 3-10 Combination of Terminals and Circuits for Online Utilization (Multiple Replies)

Machine type \ Circuit		No. of replying companies	Public circuit				Private circuit			
			300bps	1.2Kbps	2.4Kbps	2.4Kbps<	2.4Kbps	4.8Kbps	9.6Kbps	9.6Kbps<
PC	Desktop	395	54 (13.7)	290 (73.4)	197 (49.9)	6 (1.5)	26 (6.6)	5 (1.3)	12 (3.0)	4 (1.0)
	Laptop	119	13 (10.9)	81 (68.1)	56 (47.1)	4 (3.4)	8 (6.7)	1 (0.8)	2 (1.7)	1 (0.8)
Word processors		31	0 (0.0)	26 (83.9)	12 (38.7)	0 (0.0)	2 (6.5)	0 (0.0)	1 (3.2)	0 (0.0)
Special-purpose terminals		91	8 (8.8)	50 (54.9)	28 (30.8)	5 (5.5)	15 (16.5)	8 (8.8)	8 (8.8)	9 (9.9)

Note: Parenthesized ratios show the percentages of replying companies by terminals.

5. Utilization of Other than Online Database Services

5.1 How Offline Database Services are Used

As mentioned in 3-(3), the replies to the questionnaire suggest that more users are using online database services together with offline database services. Table 3-11 shows various forms of offline database service utilization and the ratio of each services used. On an overall basis, the most preferred method is "requests hard copies, faxes, etc. from vendors" (58.2%), followed by "MT, FD, and CD-ROM" (36.0%), and "SDI" (35.3%). The "SDI," which ranked first in the survey conducted two years ago, has decreased partly because of declining utilization by large companies, another sign of diversification of information needs. By category, many in the "oil/chemistry" and the "electric/machinery/transport equipment" are using offline database services; namely, 60.9% of the former using SDI and 81.1% of the latter fax.

5.2 Media of Offline Database

Table 3-12 shows various media and the ratio they are used. As can be seen from the table, MT have shown a slight decline, while FD and CD-ROM disks are gaining popularity.

On MT, the most-purchased databases are "COSMOS 1, 2," "Ringdoc," "TSR Corporate profile/Finance," etc. More than 80% of the purchasers are

large companies, perhaps reflecting the hardware requirements for using those databases.

On CD-ROM, the most-purchased databases allow the user to take advantage of the media; namely, "MEDLINE," "CD-HIASK," "J-BISK," etc.

Table 3-12 Ratio of MT, FD and CD-ROM Purchases (Multiple Replies)

Purchased media	1990 (N=78)	1991 (N=93)
	No. of replies (%)	No. of replies (%)
MT	46 (58.9)	47 (50.5)
CD-ROM	35 (44.9)	45 (48.4)
FD	10 (12.8)	18 (19.4)

6. Issues on Pricing and Utilization

6.1 Pricing Issues

Of all the respondents to the questionnaire, 64.9%, or 315 organizations, are unhappy about the information costs (i.e., the costs for using databases, excluding those for telecommunication and for using terminal). Figure 3-6 shows some points of user dissatisfaction regarding both Japanese and foreign database services. In both cases, a majority of the questionnaire respondent answered that "usage costs are too high." The answer "base rate plus usage costs are too high" in regard to Japanese databases is twice that of foreign databases.

Table 3-11 Means of Utilizing Commercial Databases, Excluding Online Access (Multiple Replies)

Values in () are percentages

Means of utilization Company size	No. of replies	MT, FD, and CD-ROM	Requests hard copies, faxes, etc. from vendors	SDI (see note)	Requests to information broker	Others
Small/medium	32	7 (21.9)	21 (65.6)	9 (28.1)	1 (3.1)	3 (9.4)
Large	198	65 (32.8)	120 (60.6)	78 (39.4)	17 (8.6)	8 (4.0)
Public service	45	27 (60.0)	19 (42.2)	10 (22.2)	2 (4.4)	1 (2.2)
Total	275	99 (36.0)	160 (58.2)	97 (35.3)	20 (7.3)	12 (4.4)
Previous survey (1990)	226	80 (35.4)	94 (41.6)	85 (37.6)	17 (7.5)	22 (9.7)

Note: SDI service allows previously-requested items to be stored with "search expressions" and provides hit information whenever databases are updated.

Also, when asked whether they consider costs other than the information costs to be comparatively high or not, 35.7%, or 164 companies, answered "yes." The details are "telecommunications cost" (48.6%), "terminal excluding telecommunications equipment" (25.1%), and "telecommunications software" (24.6%).

6.2 Utilization Issues

Table 3-13 lists various problems concerning commands and other functionality/operability of commercial database services, viewed from the user's point of view. Of 463 repliers, 62.4% answered "inconsistent commands." Following this are "slow search speed" (40.6%), and "need of a comprehensive thesaurus" (38.7%). These three answers were also listed high in the 1989 and 1990 surveys. Although there are no remarkable differences among the by-industry

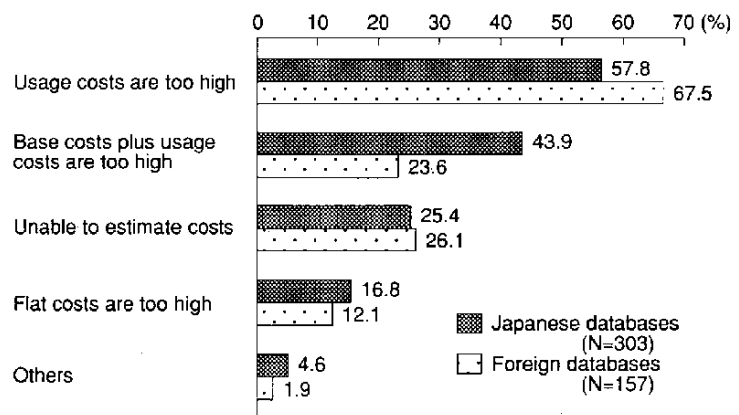


Figure 3-6 Dissatisfaction with Database Usage Costs (Multiple Replies)

breakdown of the replies, the answers "inconsistent commands" and "need of a comprehensive thesaurus" are much higher in secondary industries than in tertiary industries, whereas "slow search speed" is higher in tertiary industries. This may owe to the fact that secondary industries are using more vendors.

Table 3-13 Comment on Functions, Operability and Commands of Commercial Database (Multiple Replies)

Problems	(%)	
	1991	1990
Inconsistent commands	62.4	66.0
Insufficient function keys	10.6	8.3
Only command driven is available for searching	10.6	8.7
Only menu driven is available for searching	8.4	5.9
Insufficient keywords	23.1	23.2
Need of a comprehensive thesaurus	38.7	40.4
Need function that allows reference to the appearance frequency of specific keywords by file or by database	16.8	12.8
Unable to perform down loading	26.8	25.3
Lack of gateway function	17.9	18.4
Need functions that apply to expert systems	10.8	14.7
Natural language necessary as search language	27.4	27.4
Machine translation necessary as a function	6.9	7.3
Problems with connection procedures	17.3	20.6
Slow search speed	40.6	35.9
Others	4.1	3.3
	(N=463)	(N=423)

7. Database Users

The number of people who actually search databases at the surveyed organizations is 56.6 persons on an overall average, and over 1,000 persons in some cases. Looking at the distribution of the answers, the largest portion of the answers is in the class of "4 to 6 persons," and the total of the answers in the classes below "10 persons" accounts for 72.3% (see Table 3-14). For small and medium-size businesses, the average is 4.2 persons and the "under 10 persons" ratio is 97.2%. For large companies, on the other hand, the average is 63.8 persons, reflecting the situation that 27 repliers (8.6% of the whole) gave figures of over 51 persons and some of them over 1,000 persons. 70.4% of the small and medium-size businesses, 61.7% of the large companies, and 63.1% of the total answered that their number of database operators was sufficient.

The average number of users per registered password is 8.3 persons on an overall basis. The distribution is 21.3% in the "over 10 persons" class, 20.2% in the "2 persons" class, 17.3% in the "3 persons" class, etc. (see Table 3-15). For large companies, 24.8% is in "over 10 persons," 19.9% in "2

persons," 17.9% in "3 persons," etc. For small and medium-size businesses, meanwhile, 26.8% is in the "1 person" class and a total of 69.0% is in the classes of "3 persons" and below.

49.7% of the repliers, or 246 companies, have a section within their companies that provides database search services. By company size, 32.4% of the small and medium-size businesses and 52.5% of the large companies have such an in-house database search service section. By industry, 73.8% of the companies in the "oil/chemistry" have such a section, and so do many in the other manufacturers." In the "other business-to-business services" and "finance/insurance," however, less than 25% of the companies provide internal search service sections; database users in these categories may search databases themselves. The average number of information specialist at such in-house search service sections is 4.0 persons on an overall basis (2.7 persons in small and medium-size businesses and 4.5 persons in large companies).

The answers to the question as to how their database users are trained are "OJT" (56.1%), "by attending seminars held by vendors" (55.1%), "self-training" (51.7%), etc. (See Table 3-16).

Table 3-14 Distribution of Number of Database Users by Company Size

Company size	No. of users	No.	1		2		3		4-6		7-10		11-20		21-50		51 or more		Average of persons
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Small/medium		71	14	19.7	12	16.9	11	15.5	26	36.6	6	8.5	1	1.4	1	1.4	0	0.0	4.2
Large		314	20	6.4	28	8.9	24	7.6	71	22.6	64	20.4	47	15.0	33	10.5	27	8.6	63.8
Public service		81	9	11.1	10	12.3	10	12.3	24	29.6	8	9.9	11	13.6	2	2.5	7	8.6	74.5
Total		466	43	9.2	50	10.7	45	9.7	121	26.0	78	16.7	59	12.7	36	7.7	34	7.3	56.6

Table 3-15 Distribution of Number of Users per Registered Password by Company Size

Company size	No. of users	No.	1		2		3		4		5		6-9		10 or more		Average of persons
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Small/medium		71	19	26.8	15	21.1	15	21.1	4	5.6	12	16.9	3	4.2	3	4.2	3.2
Large		307	37	12.1	61	19.9	55	17.9	24	7.8	39	12.7	15	4.9	76	24.8	8.0
Public service		78	8	10.3	16	20.5	9	11.5	8	10.3	15	19.2	4	5.2	18	23.1	14.6
Total		456	64	14.0	92	20.2	79	17.3	36	7.9	66	14.5	22	4.8	97	21.3	8.3

8. Reasons for not Using Commercial Databases

33.6% of the repliers, or 260 organizations, say they do not use commercial databases, and 254 of them state their reasons for not doing so. Table 3-17 is a by-company-size summary of the answers. On an overall basis, the reasons most frequently given are "no need" (52.8%), "insufficient knowledge of what databases are available" (21.3%), "usage costs are too high" (20.5%), etc. The ratio of each reason given has

not changed much from the previous survey, except for "insufficient knowledge of what databases are available," which has increased, especially for small and medium-size businesses, by about 10 points. In contrast, the ratios of such reasons as "insufficient hardware" and "usage costs are too high" have decreased. Large companies cited cost-related reasons more frequently, such as "no budgetary measures," "usage costs are too high," and "telecommunication costs are too high."

Table 3-16 Training Method for Database Users by Company Size (Multiple Replies)

(%)

Company size	Small/ medium (N=72)	Large (N=345)	Public service (N=84)	Total (N=501)
Training method				
OJT (On the Job Training)	44.4	61.7	42.9	56.1
Attending seminars held by vendors	56.9	55.7	51.2	55.1
Self-training	55.6	46.7	69.0	51.7
No training	15.3	14.8	15.5	15.0
Holding regular in-house seminars	5.6	12.5	3.6	10.0
Employing specialists for online search	5.6	2.3	2.4	2.8
Others	2.8	3.2	3.6	3.2

Table 3-17 Reason for Not Using Commercial Databases (Multiple Replies)

(%)

Company size	Small/ medium (N=53)	Large (N=146)	Average of total (N=254)
Reason			
Unable to understand usage	7.5	5.5	5.9
Insufficient knowledge of what databases are available	28.3	20.5	21.3
Complicated procedures	3.8	2.7	2.8
Insufficient hardware	3.8	5.5	5.1
Terminals (excluding telecommunication) too expensive	1.9	5.5	3.5
Telecommunication software too expensive	0.0	6.8	3.9
Telecommunication costs are too high	5.7	13.7	11.8
Usage costs are too high	13.2	23.3	20.5
No budgetary measures	5.7	11.0	13.8
Lack of searchers	5.7	6.8	7.9
Required databases insufficient	11.3	6.8	6.3
No need	56.6	54.1	52.8
Others	15.1	9.6	11.0

9. Future Plans

9.1 Future Plans for Database Utilization

Of the organizations that answered they were not using commercial database services, 41.7% or 106 organizations are potential users, saying they intend to start using commercial databases "within 1 year" (3.1%) or "within 2 to 3 years" (38.6%). However, 58.3% of the non-users "have no plans to become users." Of the small and medium-size businesses, as many as 63.6% do not expect to be database service users.

9.2 Categories of Databases Considered for Future Utilization

Figure 3-7 summarizes the answers of the organizations currently not using commercial databases about the categories they want to use in the future, as well as geographic areas to be covered. As the question allows multiple answers, the total number of replies does not correspond to the number of the repliers. As can be seen from the chart, the "business," "general," and "natural science and technology" received 251, 223, and 104 answers, respectively. For the "business," subcategories such as "marketing" and "corporate finance/profile" are much needed. In every

categories, the demand for "Japanese" information is high.

10. Using Databases Via PC Network Services

Of all the surveyed organizations, 300 (39.8%) are "using PC network services." By industry, the ratio is higher in the "data processing and information service," with 62 of the 118 repliers in this category (52.5%) are using PC network services. The other industrial categories showed more or less the same ratios. With respect to secondary industries vs tertiary industries, the averages are 37.5% and 43.3%, respectively. The PC network services most preferred by the users are "NIFTY-Serve" (54.6%), "PC-VAN" (28.8%), and "Nikkei MIX" (10.2%). An analysis by organization size reveals that NIFTY-Serve, the most preferred by both small and medium-size businesses and large companies, retains the same popularity as the second preference, PC-VAN, among small and medium-size businesses, whereas it has a great lead on its runners-up among large companies (see Figure 3-8).

The most frequently used menus among PC network services are, on an overall basis, "databases" (53.9%), "electronic mail" (51.9%), and "BBS," at

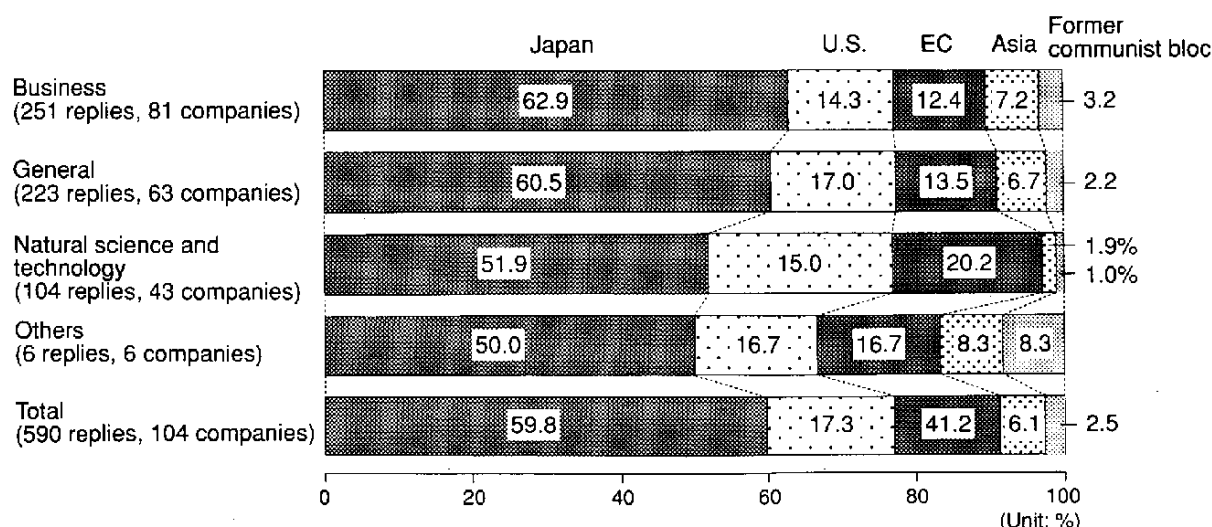


Figure 3-7 Categories and Geographic Areas to be Covered in the Future (N=104, Multiple Replies)

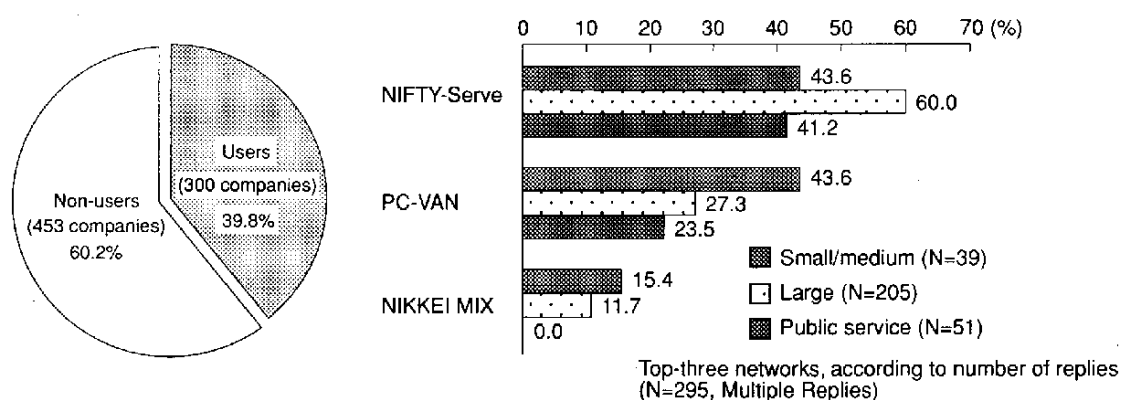


Figure 3-8 Utilization of Frequently-Used PC Network Service

42.1% (see Table 3-18). The ratio of database users is 10 points higher among small and medium-size businesses than among large companies. This suggests that PC network services are of great help to small and medium-size businesses, in terms of ease of installation and operation.

11. CD-ROM Issues

11.1 Utilization of Information on CD-ROM

94 out of 759 repliers (12.4%) use information products provided on CD-ROM (such as CD-ROM databases). By industrial categories, many public services such as educational institutions and libraries (23.8% of the replying organizations) are using CD-ROM products. On the other hand, in the categories of finance, insurance and construction usage of CD-ROM products is not so high.

11.2 Information Categories

Regarding the contents of the CD-ROM products by category, 38 out of the 91 replying companies (41.8%) are using "bibliography/publications," 35 companies (38.5%) use on "medicine/pharmaceutics/biotechnology/chemistry," while 20 companies (22.0%) are using "Cyclopedia/dictionary/encyclopedia/directory." Business related databases covering "corporate finance/profile" and "commodities/products," etc., are not used very much (see Figure 3-9).

11.3 Reasons for and Frequency of CD-ROM Utilization

As the reasons for using CD-ROM products, 53 out of 92 (57.6%) companies replying to the questionnaire cite that CD-ROM is "more space-saving than micro- or printed documents." Following

Table 3-18 Frequently-Used PC Network Service Menus (Multiple Replies)

		(%)		
Menu \ Company size	Small/medium (N=41)	Large (N=204)	Total (N=297)	
Database	63.4	52.0	53.9	
Electronic mail	56.1	53.4	51.9	
BBS (electronic bulletin board)	29.3	40.7	42.1	
Electronic conferences	17.1	11.3	11.1	
Transaction services	12.2	3.9	4.7	
Others	4.9	10.3	9.1	

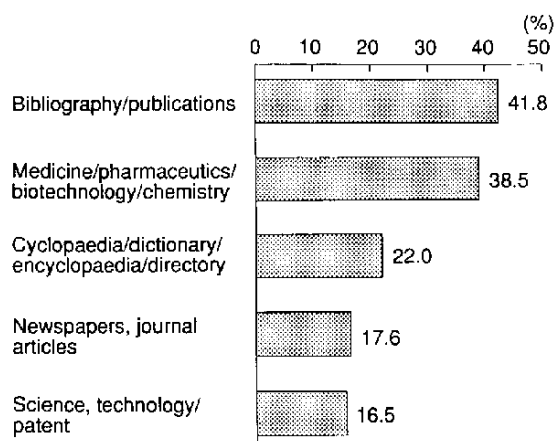


Figure 3-9 Information Categories Frequently Used via CD-ROM

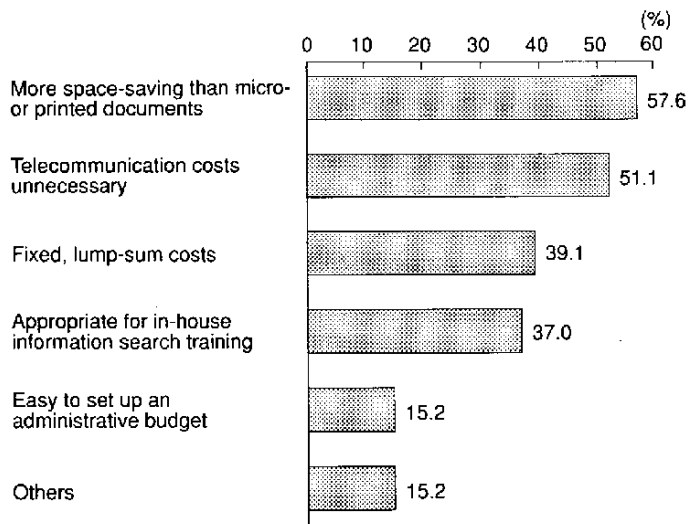


Figure 3-10 Reasons for Using CD-ROM

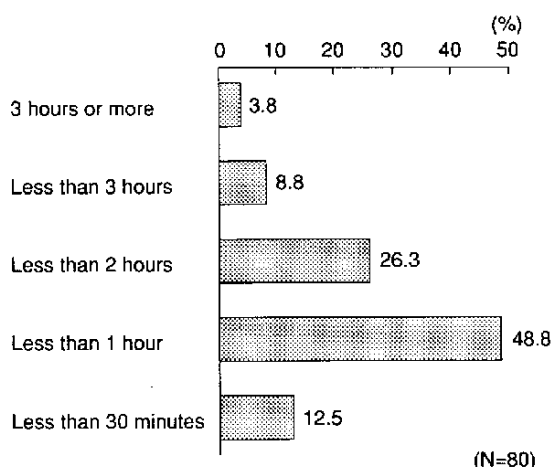
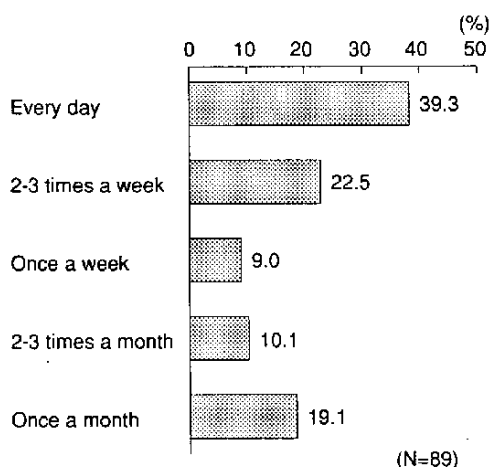


Figure 3-11 Utilization Frequency and Average Utilization Time of CD-ROM

this are "telecommunications costs unnecessary" (51.1%), "fixed, lump-sum costs" (39.1%), "appropriate for in-house information search training" (37.0%), etc., without any remarkable changes from the previous survey. These findings would suggest that CD-ROM products are used mostly as substitutes for printed material (see Figure 3-10).

As regards the frequency of use, "every day" ranks first at 39.3%. The distribution of repliers with respect to the average amount of time per search of using CD-ROM products is 48.8% in the class of "less than 1 hour" and 26.3% in the class of "less than 2

hours." The overall average is 0.9 hours (see Figure 3-11).

11.4 Problems Related to CD-ROM Utilization

As for the problems currently encountered in the use of CD-ROM products, 39 out of 73 repliers (53.4%) cited "inconsistent search software," which also ranked first in the 1989 and 1990 surveys (see left of Figure 3-12). Following this are "infrequent information updates" (52.1%), "hardware is not standardized" (49.3%), "software seems expensive" (41.1%), "slow search speed" (37.0%), etc.

11.5 Reasons for not Using CD-ROM

598 organizations answered that they were not using CD-ROM products at the time of the present survey. Figure 3-12 is a summary of the reasons given for not using CD-ROM. Note that the higher-ranking

answers, not only "no need" (47.3%) but also "required information not available on CD-ROM" (35.6%) and "infrequent information updates" (26.8%), include the replies from organizations that do not use databases at all.

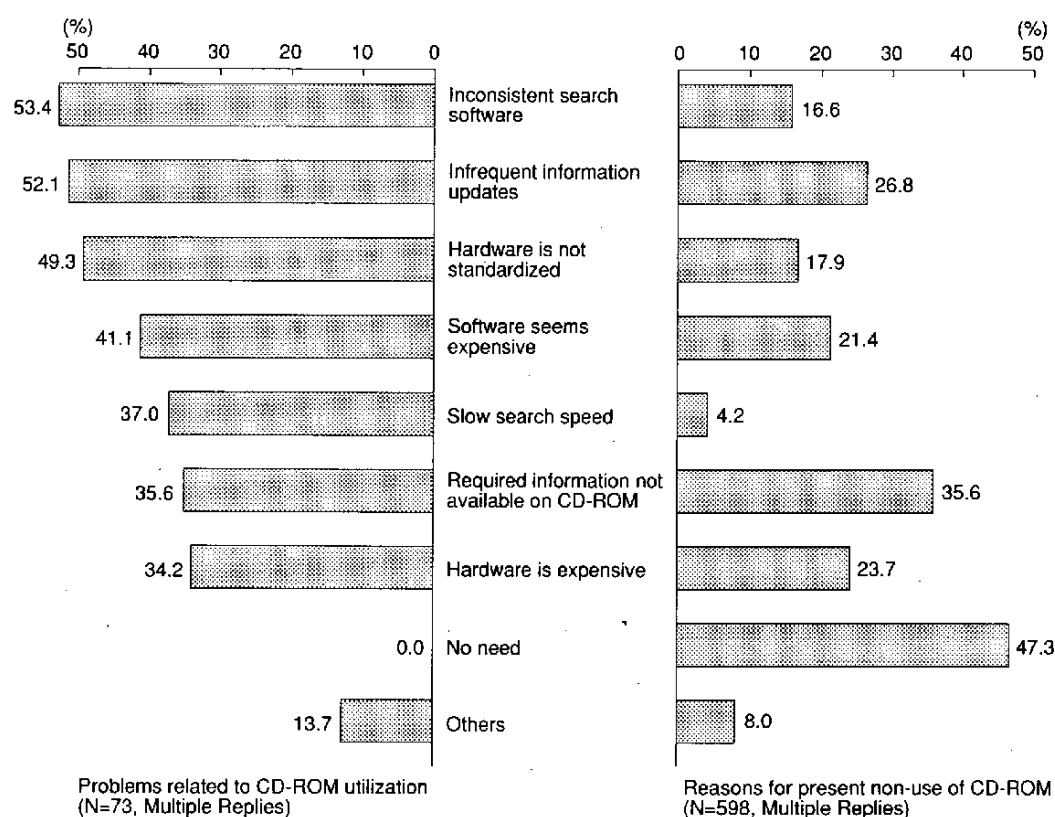


Figure 3-12 Problems Related to CD-ROM Utilization/Reasons for Not Using CD-ROM

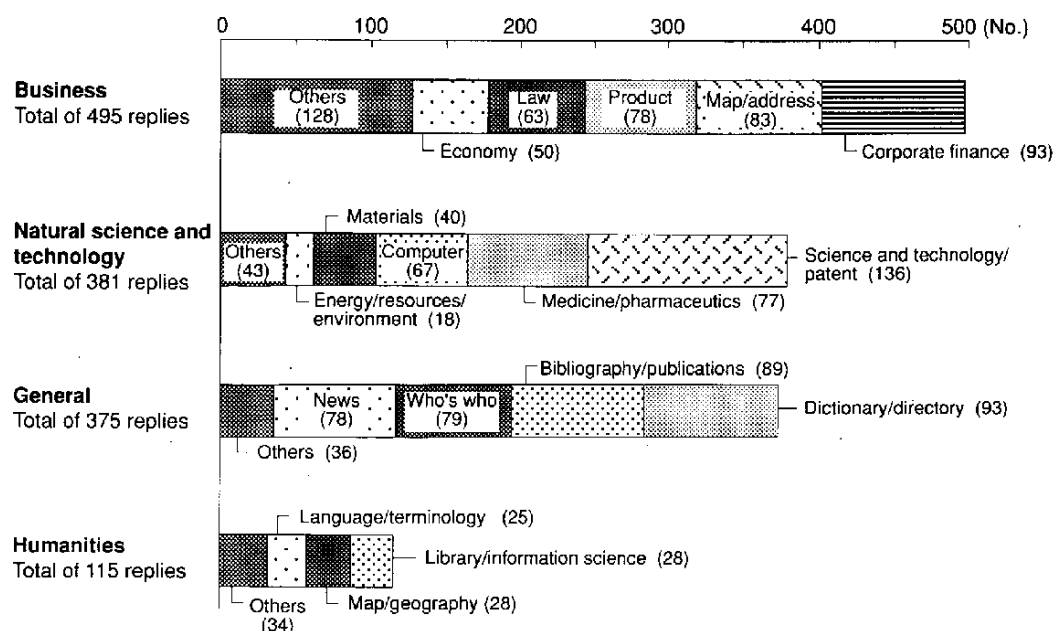


Figure 3-13 Required Categories of Information on CD-ROM for Future Use

11.6 Information Categories on CD-ROM for Future Use

It was asked of both current CD-ROM users and non-users as to what categories of CD-ROM products they want to use in the future. 447 companies responded by multiple answers. In a broader

breakdown, the "business" ranks first at 495 replies, followed by "natural science and technology" and "general." "Business" received more answers from tertiary industries than from secondary industries. In a finer breakdown, "science and technology/patent" received more than 30% of all the answers.

IV. INTERNATIONAL DEVELOPMENT OF JAPANESE DATABASES

1. Globalization of Japanese Database Services

1.1 The State of Globalization

Japan Database Industry Association (DINA) has been conducting a series of survey of its members and other Japanese database services in order to establish the availability of Japanese database services in the overseas market, as well as to find out the problems encountered by those who are expanding their services abroad. The questionnaire was distributed to a total of 206 companies (105 DINA members, and 101 others), and 133 valid responses were delivered (64.6% response ratio) by August 17, 1992.

Of the organizations which responded, currently 43 are offering database services abroad, while 18 are planning such services.

The results show that a total of 290 database developed in Japan are accessible by overseas users. As shown on Figure 4-1, the number has been increasing steadily for last five years, and the number in 1992 is increased 28% compared to the previous year.

Of the 290 databases accessible from overseas in July, 1992, 28 (9.7%) are in the fields of science/technology, 133 (39.3%) are of economics/business/finance, 114 (39.3%) are of general, 6 (2.1%) are of economics/business/finance and general, 6 (2.1%) covers all these fields, one is of science/technology and economics/business/finance, and one is of others.

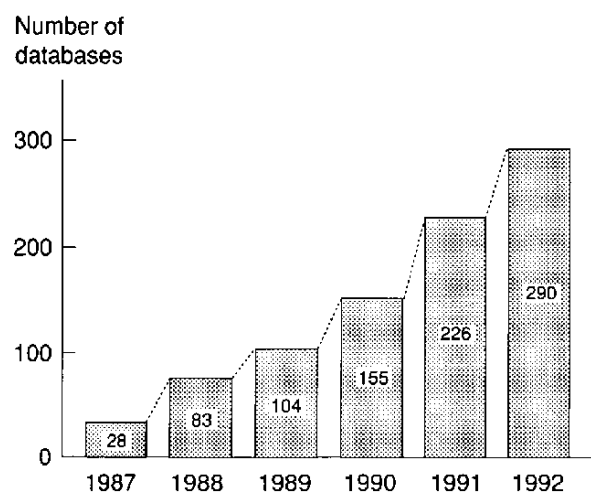
Concerning the language distribution of the 290 databases, it was found that 185 (63.8%) are in Japanese, 48 (16.6%) are in English, 46 (15.9%) are in Japanese and English, 5 (1.7%) are in Japanese, English, and other language, 5 (1.7%) are in other language, and one is in English and other language.

Distribution media of the 290 databases are also examined. It was demonstrated that 224 (77.2%) are online, 30 (10.3%) are online and magnetic tape (MT),

20 (6.9%) are MT, 7 (2.4%) are online, MT and CD-ROM/CD-I, 5 (1.7%) are CD-ROM/CD-I, one is online and CD-ROM/CD-I, and one is MT and CD-ROM/CD-I.

Concerning the share of overseas sales among the total database sales of each 43 companies offering overseas services, 26 (60.5%) are under 5%, 2 (4.7%) are between 6% and 10%, one is between 11% and 20%, one is between 21% and 30%, and 4 (9.3%) are more than 30%. Companies which gain larger portion of total sales from overseas services are characterized as (1) having service and support center in overseas, (2) develop databases in English and/or other non-Japanese languages to respond overseas market needs, and (3) offering online services.

Appendix 1-1 and 1-2 are the lists of Japanese databases accessible from overseas, where Appendix 1-1 lists databases answered by producers and Appendix 1-2 lists those by vendors. As it may be found from browsing the tables, there are many



Source: "Database Directory," MITI, DINA Survey

Figure 4-1 Number of Japanese Databases Accessible from Overseas

overlaps in each appendix and between two appendices. It reflects the cases that many companies took part in development and distribution of a database, and that many databases are distributed by more than two vendors. Appendix 2 is a summary of Japanese databases being planned for overseas expansion as of August 17, 1992.

1.2 Problems Encountered by Database Services in Globalization

Answers to the question on what sort of issues arise while planning or providing database services for overseas use disclosed a variety of issues, which are summarized as follows:

(1) Problems in Finding Overseas Market Needs (8 responses)

Overseas demands and market size are difficult to define. Actual size of clients is very small, which makes promotion and marketing quite difficult. The database services in Japanese language are very hard to be accepted in overseas market.

(2) Problems Related to Operation and Service (6 responses)

At the overseas market with considerable time differential, accessible time frame of the Japanese database service is quite limited, and offering full-time service requires 24 hour operation of the online service as well as user support. Such full-time operation requires heavy investment on manpower and communication facilities. Considering the translation of user manuals or interaction with users' telephone calls from overseas, it is impossible to establish the full-time service.

(3) Problems Related to the Online Terminals (6 responses)

Accessing to Japanese language databases require online terminals with the capability of retrieving and printing in Japanese characters. Even though IBM PC/AT machines widely available in overseas market are capable of dealing with Japanese characters, few overseas people know about that.

In the case of systems with output in facsimile transmitters, the overseas technical standard does not

correspond to Japanese one: A4, letter size or legal size facsimile machines are widely used in overseas, which does not accept B4 size output usually used in Japan.

(4) Problems on Telecommunication (5 responses)

Cost of international telecommunication for online database services, especially of facsimile transmission is too expensive. In order to resolve the telecommunication cost problem, it is necessary to take into consideration the SQL like concept of reducing communication traffic proposed by IBM in 1987, and to standardize the communication protocols.

(5) Language Problems (3 responses)

Cost of translation of Japanese text into English is quite expensive. In order to recover the investment on the translation, it is necessary to increase service charge, which makes the overseas service quite expensive. For the quality of translation, enrichment of dictionaries used for translation is expected. Language barriers is the bottleneck for overseas services.

(6) Problems of Uncertain Profitability (3 responses)

It seems impossible to recover the cost of offering database services overseas and to make profit from overseas services.

(7) Legal Problems (3 responses)

Copyright clearance of database is difficult. In the case of online service with remote computing (information processing) capabilities, it might infringe the COCOM regulations if offered to overseas.

(8) Problems Related to Manpower (2 responses)

Shortage of manpower in corresponding inquiries from overseas users as well as in user-training at the overseas market is expressed.

(9) Other Problems

- 1) Some Japanese database producers are reluctant to globalization.
- 2) Requirement for guard against hackers is more serious in overseas market compared to domestic market.
- 3) Commissions for banks in exchanging collected user fees is substantial, which reduce the profit of the service considerably.

4) If the necessity of overseas database services is widely recognized in Japan, establishment of a public body to advice and resolve the following issues is called for:

- Translation of system response into standardized English messages
- Translation of user manuals
- Collection of user fees
- Procedure on customer services
- Service and system operation time
- Negotiation (contracting) procedure with users to prevent the liability lawsuits.

2. Foreign Needs of Information on Japan

2.1 Demand in the U.S. for Japan-related Information

(1) Foreign Needs of Information on Japan

In October 1991, the Database Promotion Center, Japan (DPC) conducted the "Survey of User Awareness of Database Services in the United States," surveying American end users (private companies and public organizations), for the purpose of grasping the utilization state of commercial databases in the United States, the trend of demand for information on Japan, etc. (Concerning surveying method as well as distribution by industry, refer to "III-1. The State of Commercial Database Utilization.") The survey was conducted with 3,000 persons randomly selected from

Table 4-1 Needs of Information on Japan

Users	No. of replies and ratio	No. of replies (%)	Necessary		Not necessary	
			No.	%	No.	%
By size						
Small/medium		22 (8.6)	16	72.7	6	27.3
Large		130 (50.6)	103	79.2	27	20.8
Public service		105 (40.8)	75	71.4	30	28.6
By category						
Oil/chemistry		14 (5.3)	11	78.6	3	21.4
Electric/general/transport equipment		21 (8.0)	17	81.0	4	19.0
Other manufactures		27 (10.3)	21	77.8	6	22.2
Subtotal		62 (23.6)	49	79.0	13	21.0
Finance/insurance		13 (4.9)	10	76.9	3	23.1
Telecommunications/electronic information services		16 (6.1)	14	87.5	2	12.5
Other services		15 (5.7)	11	73.3	4	26.7
Law firms/consultants		46 (17.5)	35	76.1	11	23.9
Subtotal		90 (34.2)	70	77.8	20	22.2
Education/medical services		56 (21.3)	38	67.9	18	32.1
Not-for-profit organizations/government		49 (18.6)	37	75.5	12	24.5
Subtotal		105 (39.9)	75	71.4	30	28.6
Others		6 (2.3)	6	100.0	0	0.0
Total		263	200	76.0	63	24.0

Note: Parenthesized figures show the component ratio by size and industry category.
The total number of replies classified by size is, however, 257.

the Special Libraries Association (SLA) member list. The number of respondents amounted to 273—a recovery rate of 9.1%. The followings are the analytical results of the survey.

Overall, American end users expressed a potentially high need for information on Japan. Out of 263 respondents, 200 (76.0%) answered that they had had opportunities to access information on Japan in dealing with business, management, product development, and basic research. Distribution by industry shows that approximately 70-80% of the respondents in industrial categories such as manufacture, service, and public services expressed the necessity of information on Japan. This distribution also shows that the "telecommunications/electronic information" industry is outstanding, recording 87.5% of the

demand of all respondents, followed by the "electric/general/transport equipment" industry at 81.0%; this industry is in keen competition with its Japanese counterpart (see Table 4-1).

(2) Utilization of Information on Japan by Category and Obtainability

Of the surveyed 200 American end users expressing potential needs of information on Japan, 157 (78.5%) answered that they had had experience of using information on Japan during the past two years. Table 4-2 shows the utilization state of information on Japan by category, where the "journal articles" accounts for the highest rate at 63.1%, followed by "news" at 52.2%, "Corporate credit" at 46.5%, "finance/economy" at 46.5%, "science/technology" at 38.9%, "products" at 34.4%, "research papers/books" at

Table 4-2 Utilization of Information on Japan by Category (Multiple Replies)

Japanese information categories	Experienced in utilizing information	Faced difficulty when collecting information
Corporate credit	73 (46.5)	39 (53.4)
Vital statistics	35 (22.3)	15 (42.9)
Theses/dissertation	17 (10.8)	12 (70.6)
Finance/economy	73 (46.5)	31 (42.5)
News	82 (52.2)	22 (26.8)
Government publications	32 (20.4)	22 (68.8)
Journal articles	99 (63.1)	49 (49.5)
Marketing	28 (17.8)	14 (50.0)
Research papers/books	48 (30.6)	20 (41.7)
Patent	44 (28.0)	18 (40.9)
Draft papers/proceedings	32 (20.4)	22 (68.8)
Products	54 (34.4)	26 (48.1)
Science/technology	61 (38.9)	34 (55.7)
Who's who	44 (28.0)	22 (50.0)
Others	14 (8.9)	8 (57.1)
No. of replies	157	83

Note: Experienced in utilizing information: The number of replies here means the number of companies utilizing information related to Japan for the past two years. Parenthesized figures shows the percentage of these companies or organizations.

Faced difficulty when gaining information: The number of replies here means the number of companies utilizing information regarding Japan for the past two years and that faced difficulty when collecting information.

Parenthesized figures show the percentage of these companies or organizations.

30.6%, "patent" at 28.0%, and "who's who" at 28.0%.

From the viewpoint of industry, in using information on Japan, the "oil/chemistry" used information on "journal articles" at a rate of 90.1%, followed by "patent" and "products" at 80.0%, "science/technology" at 70.0%, and "draft papers/proceedings" at 50.0%. As regards "electric/general/transport equipment," the utilization rate of "science/technology", "journal articles" and "patent" stood at 71.4% respectively. As for "other manufacture" use information on "news" at a utilization rate of 81.3%, subsequently followed by "journal articles," "corporate credit," and "finance/economy," all at 62.5%. The "finance/insurance" utilized information on "corporate credit" at a rate of 100%, followed by "finance/economy" at 66.7%. The "telecommunications/electronic information services" mostly took advantage of "finance/economy" at a utilization rate of 66.7%. As for "other services," 85.7% examined

"corporate/credit" and "finance/economy" and 71.4% looked at "news" and "journal articles." As regards the "law firms/consultants," the utilization rate of "news" stood at 70.8%, subordinating "corporate credit" at 66.7%, and "finance/economy" at 62.5%. Both the "education/medical services" and the "not-for-profit organizations/government" showed a relatively high utilization of "journal articles" at 70.6% and 67.9%, respectively. Accordingly, the above analysis shows that utilization of information on Japan heavily depends on the nature of each industry.

(3) Means for Obtaining information on Japan

How have American users obtained desired information on Japan? We found that 149 (76.4 %) out of 195 respondents retrieve their data from "reference literatures published outside Japan." The information is also available from "databases produced outside Japan" (71.3%), "universities and public libraries" (53.8%), "U.S. government and authorities" (41.1%), "information brokers" (11.8%), and "others" (4.1%).

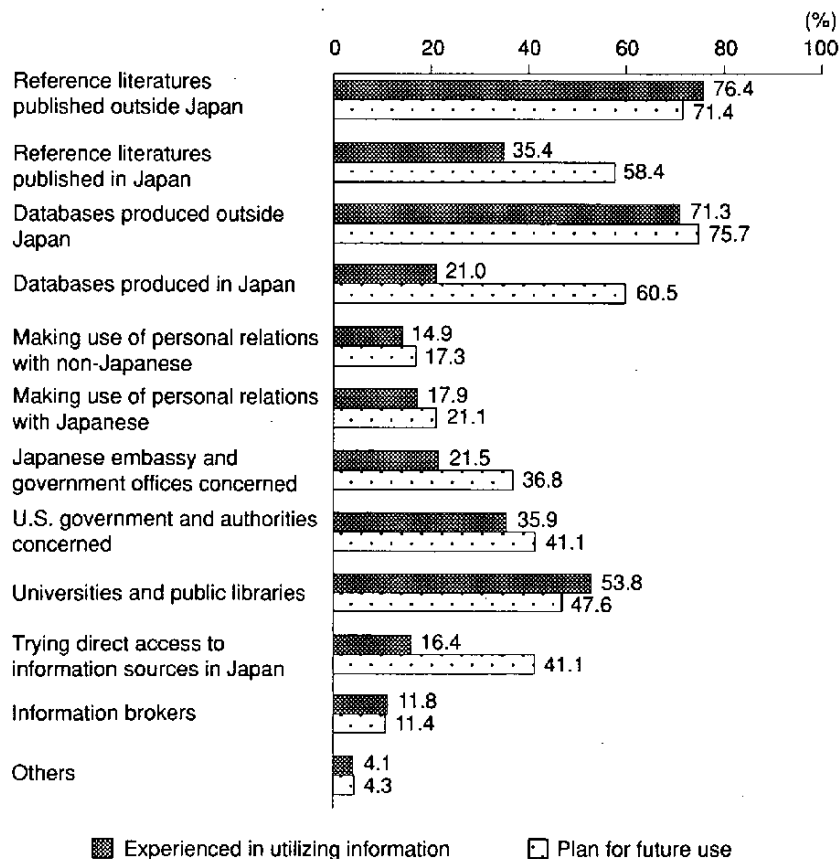


Figure 4-2 Methods of Obtaining Information on Japan

concerned" (35.9%), and "reference literatures published in Japan" (35.4%) (see Figure 4-2).

According to the surveyed end users, the most considered future means for obtaining information on Japan is through "databases produced outside Japan" at 75.7%. Then follows "reference literatures published outside Japan" (71.4%), and "databases produced in Japan" (60.5%) (see Figure 4-2). As this suggests, the means to collect information on Japan will gradually shift from publications to databases. In terms of company size, modal changes in the obtainment of information on Japan are of outstanding value to small and medium-size businesses. Thus far, small and medium-size businesses have taken advantage of foreign databases at a utilization rate at 50.0%, and of Japanese ones at a rate at 25.0%; in the future, however, the utilization rates for both these types of databases are supposed to increase dramatically to 71.4% and 64.3%, respectively.

When comparing the sources of information between Japanese and foreign ones, it becomes clear that end users rely heavily on foreign information sources, whether the information is obtained via hard copy (such as reference literatures), databases, or through embassies/government offices, except when making use of personal relations. According to the survey, regarding the means for obtaining information on Japan, end users "trying direct access to information sources in Japan," are at a present utilization rate of 16.4%, and will increase to 41.1% in the future. Opportunities to access information on Japan directly will also increase, both in the form of hard copies and databases.

(4) Evaluation of Databases Containing Information on Japan

American end users' impression of databases that contain information on Japan is expressed in the following figures: 57.1% of them are "satisfied," while 43.9% feel "unsatisfied." Specifically, industries discontented with the services are the industries of "other manufacturers" (81.8%), "electric/general/transport equipment" and "not-for-profit organizations/government" (both at 66.7%), as well as "finance

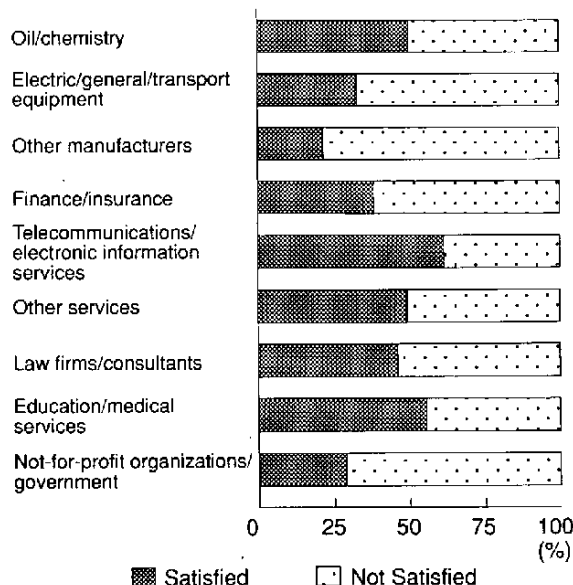


Figure 4-3 Evaluation of Databases Containing Information on Japan

/insurance" (60.0%), as shown in Figure 4-3.

The main reasons for their dissatisfaction are as follows, in descending order (see Figure 4-4): "full-text databases are not available" (68.6%), "abstracts in English are not well-prepared" (58.8%), and "required information is not registered" (51.0%). Thus American end users, as deduced from the above, are strongly looking forward to the repletion of abstract information on Japan in English, as well as the preparation of full-text databases. By and large, it is true that information on Japan translated into English is far from sufficient. In particular, most claims for full-text databases have risen from the "electric/general/transport equipment" industry.

Additional discontentment recorded in the survey were such reasons as "insufficient guidance on databases" (41.2%), "it is difficult to access databases through popular vendors" (39.2%), "much time is required for obtaining original text information" (35.3%), etc. Therefore, support systems must be established, such as education and instructional seminars on the effective utilization of databases containing information on Japan. At the same time, since databases require different commands and

retrieval methods when accessed on different vendors, users require databases to be further available through popular vendors, such as DIALOG.

The company that entrusted us to conduct the survey, regards the supply of information on Japan that is available to the American electronic information service industry as far from mature, depicting a quite frustrated market. The company also points out that the American database service market is large, and that many end users definitely could use certain information on Japan.

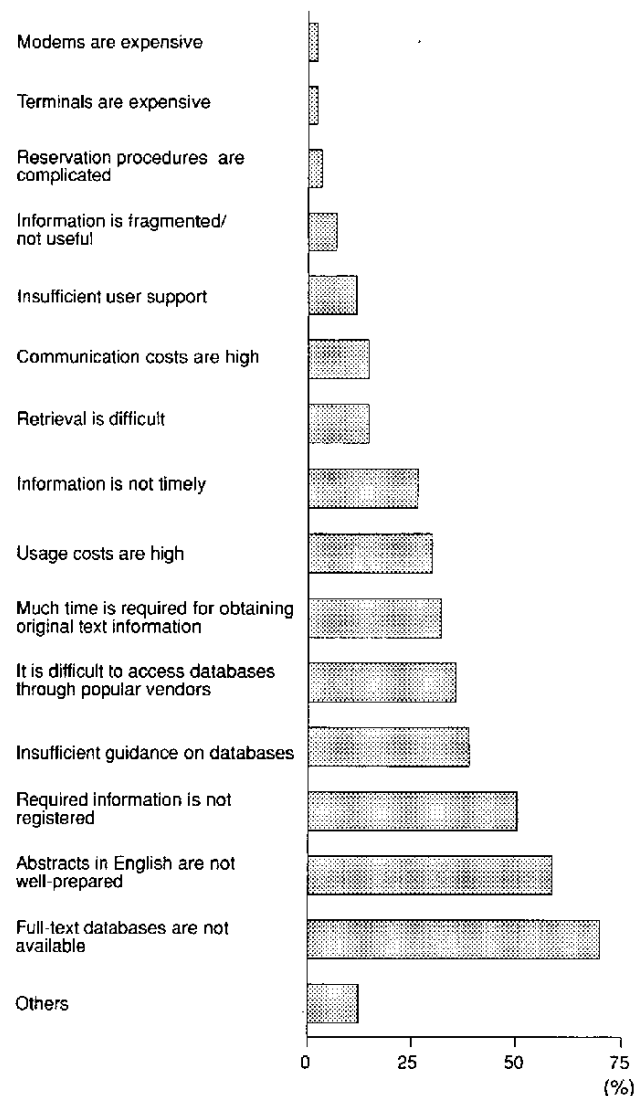


Figure 4-4 Problems Related to Utilization of Databases Containing Information on Japan

V. DATABASE PROMOTION POLICIES

1. The Ministry of International Trade and Industry (MITI)

1.1 Overall Database Production Measures

The database is one of the cornerstones of a highly advanced information society, and various industries in Japan are currently promoting the production of databases. It is necessary, however, to continue effective research on production and utilization of databases. In line with the internationalization of the Japanese economy and society, it is also necessary to promote information exchange with foreign countries.

Accordingly, MITI is taking overall measures to expand and spread information about the database service industry through the policies described below. MITI is also surveying new ways to diversify database services via various distribution systems and media.

(1) Promotion of Production of Important Databases

Databases enable advanced use of information, since they efficiently and comprehensively provide access to a huge quantity of information. Also, databases are becoming indispensable for the development of the Japanese economy and its tentative moves towards internationalization.

The types of databases listed below are considered important for support of the development of the Japanese economy. Production of these databases should be promoted actively through coordinated efforts by the industries and the government.

- 1) Databases that comprehensively collect fundamental data necessary for the future growth of industrial and social activities, and which can produce new resources for industrial and social activities
- 2) Databases that can be supplied to a wide range of the industrial society
- 3) Strategically important databases from an international viewpoint; that is, internationally

accepted databases unique to Japan

- 4) Databases demanded by society but that the private sector has a hard time developing, due to the many uncertainty factors—information contents, supply demands, raw information collection systems, and the technical reliability of the system itself

A few themes like the ones above are chosen every year for the types of databases listed in Table 5-1. These are considered important, and the feasibility of developing such databases is studied in order to facilitate production.

Since the start of this program in 1986, research has been carried out for development of 21 database themes. Four themes were investigated in 1986, five in 1987, four in 1988, and four in 1989. In 1991 four themes were highlighted, and the survey has just been concluded. Among the themes already surveyed, the JAN ITEM Code File Services, produced by the Distribution Systems Research Institute, has already been put into service.

(2) Globalization of Japanese Databases Services

The needs of using Japanese databases has recently become more emphasized abroad. However, according to the MITI "Database Directory," 66% of all databases available in Japan are foreign; that is, database distribution in Japan indicates excessive import. On the other hand, there is an increasing demand overseas for the utilization of Japanese databases. However, knowledge of overseas database markets is low, translation costs are high, and there are few well-established distribution channel and sales support systems. Therefore, Japanese databases have not disseminated much into foreign markets yet.

To correct this imbalance and to meet overseas needs about the information on Japan, research has been commenced for the promotion of database production for overseas markets and improvement of overseas distribution systems, in order to internationalize Japanese databases. This research was started in

Table 5-1 Development Program Surveyed for "Important Databases" in 1991

Theme and Organization in Charge	Summary
Database of Healthcare and Nursing Services Information (Institute of Systems Science Research)	Study for constructing databases on the whereabouts and health conditions of the people needing home care or home nursing, as well as on the services that they are currently receiving and that are available from the organizations concerned. Aimed at extending the scope and improving the quality of home care and nursing services amid the ageing society.
Human Engineering Database (Research Institute of Human Engineering for Quality Life)	Study for constructing databases on human characteristics (morphological, kinesiological, etc.), for use in the concept-making, planning, or design of more personal and efficient products or environments that can bring more leisure and tastefulness to people's living.
Sports Industry Database (The Sports Industries Federation (SIF))	Study for constructing databases on sports-related people, things, and places, in order to contribute to the consolidation of the sporting environment and the promotion of sports-related industries.
Video Film Industry Database (Japan Video Association (JVA))	Study for constructing databases on video film planners/producers, vendors, distributors, renters, and retailers, as well as on video film titles. Aimed to provide necessary information for the industry to better organize themselves and to protect the copyrights to the film. Also intended as references for consumers as well as people and organizations in related industries.

1989, with attention focused on foreign needs.

(3) Tax Measures for Database Producers

Database production requires immense initial investments, which extend over a long period of time. Besides, data quickly becomes obsolete, requiring frequent updates and additions. Thus there is a heavy financial burden for database production.

To alleviate this, the Database Reserve Fund was established in 1987. A corporation or individual that produces a commercial database must set 10% of the sales aside as a reserve to accommodate future database development costs. After being deterred for four years, the reserve may be disposed of evenly over four years and taxed as loss.

To use this system, the corporation or individual has to apply to MITI in order to obtain a certificate that the database is produced by them. Then, the corporation or individual reports to the tax office, presenting the certificate.

(4) Execution of Database Directory Systems

Society of today is flooded with information. Database services allow sharing of and efficient access to useful information, thereby helping to (1) avoid unnecessary costs to obtain information, (2) to promote

economical and social information, and (3) to enhance the results of industrial and social activities.

However, knowledge of database services and of how to use these services has not yet spread enough. The Database Directory System, established in September of 1982, was a breakthrough in coping with the information age.

In this system, database directory, describing the outline of database services, utilization methods, etc., are prepared on the basis of information from database service companies. This is offered to the public in order to spread knowledge of database services.

The database directory can be accessed from the National Diet Library, Regional Bureaus of International Trade and Industry, and the major Chamber of Commerce and Industry. Since 1987, DPC has published "FD edition of Database Directory," which contributes to enhancing database services in Japan.

(5) Research to Improve and Promote Databases

Research on database services will be made to study both user and supplier needs concerning database and other information services, as well as to review future problems related to these services. This type of research was started in 1984.

(6) Support of the Development of Efficient Database Operation System

Most databases distributed today are offered through several independent services both of online and offline, which hampers its availability to end users. In the long run, this hinders market expansion. Therefore, Information-technology Promotion Agency, Japan (IPA) will invest and finance in low interest rate for the development of programs to support efficient use of databases, thereby—hopefully—eliminating these problems.

(7) Support for the Database Production by Private Sector

There is a system which supports database production by private sector for future development of industrial and social activities through the Japan Development Bank, which provides capital subscription and a low-interest financing for the equipment and non-equipment funds to organizations setting up databases.

(8) Production of Public Databases and Provision of Government-owned Data to the Private Sector

Production of public databases is necessary for the promotion of trade and industry administration, such as technology databases related to public research, econometrics databases viewed by country, and databases containing information related to small and medium-size businesses.

Apart from the above, these databases will be increasingly supplied to the private sector. Moreover, various government-owned statistics, for example, will be released in the form of magnetic tapes, thus readily applicable to the private sector. Plans to improve supply conditions, etc., are also underway.

1.2 Promotion of Regional Databases

(1) A New Media Community Concept

The new media community concept involves construction of various model information systems that respond to the industrial and social needs of a regional community. Using these model systems provide an evaluation of factors such as convenience, economy, and effects on the industry and society. The database industry also plans to spread information systems through application and development of these

model information systems. Promotion of this concept would lead to improvements and expansion of the information infrastructure. This concept is expected to contribute greatly to the realization of highly advanced information communities, as it is vital to the construction of a network constituting the infrastructure of such a society. This will activate and upgrade regional economy and, thus, society itself.

Four designated development regions—Chichibushi in Saitama Prefecture, Minakuchicho in Shiga Prefecture, Ayabeshi in Kyoto Prefecture, and Innoshimashi in Hiroshima Prefecture—were added in 1991, making it a total of 85 regions.

(2) Financial Support for System Construction

1) Financing

There are two systems of construction for financing. They are interest-free financing using profit generated through sales of government owned NTT shares and special-interest financing via the Government Financial Institute.

The former one will be applied through the Japan Development Bank and the Hokkaido-Tohoku Development Corporation for third-sector corporations which promote the new media community concept.

The latter one is including the Information Promotion Plan provided by the Japan Development Bank, the Regional Information Promotion Plan provided by the Hokkaido-Tohoku Development Corporation, and loans to small and medium-size businesses.

2) Tax incentives

This is regional information promotion tax reduction plans.

Expenses suffered by not-for-profit organizations or associations in their promotion of the new media community concept may be taxed as loss.

1.3 Research and Development of a Database Interoperability System

This is a project intended to develop a system that allows sharing of large distributed databases of different models and frameworks, in order to enable

handling of multimedia information including text, graphics, audio and visual. This project aims at establishing a technical infrastructure for a highly advanced information society after the 1990s. Specifically, this project actively promotes research and development of multimedia technology, distributed database technology, high reliability technology, and the construction of an overall system through the cooperation of various industries, academic institutes, and government authorities.

The purposes of this R&D project are:

- 1) To secure the interoperability of various information equipment and systems in order to widen the range of selection, as well as to help avoiding unnecessary investments,
- 2) To take a leading role in the future development of information systems, in order to enhance the technical level as well as to alleviate the burden of total system development,
- 3) To contribute to the progress of worldwide information accessibility through taking international standards into account.

The project was finalized in late 1991, enabling the publication of the Open Systems Interconnection Implementation Specifications, the Interoperable Networking Event, and a conference on its results.

1.4 Information Service for Small and Medium-size Businesses

A database for small and medium-size businesses, the Small and Medium enterprise Information Research System (SMIRS), will be improved and expanded. SMIRS will heighten the capabilities of an important small and medium-size business information network, which connects the Japan Small Business Corporation and regional information centers. This is to ensure rapid and efficient information supply to small and medium-size businesses.

- 1) Small and medium-size business information centers

These centers collect, analyze, and generate information related to management and technology that is needed by small and medium-size businesses, and enter it all into SMIRS in a

form convenient to these businesses. The information is supplied to small and medium-size businesses via regional information centers.

- 2) Small and medium-size business regional information centers

These regional centers collect and generate information for small and medium-size businesses, in order to promote production of databases unique to that region. The centers also receive data from their respective small and medium-size business information center, and undertake research on behalf of the end users to provide information in a form convenient to small and medium-size businesses

- 3) Small and medium-size business information network system

This system is a computer network focusing on the distribution of databases production for SMIRS done by the Japan Small Business Corporation and small and medium-size business regional information centers, enabling rapid and efficient supply of central information and regional information for small and medium-size businesses.

1.5 The Paperless System of the Japan Patent Office

Since 1984, the Japan Patent Office (JPO) has been promoting a project called "the paperless system." The system, utilized online and via floppy disk, was started in December 1, 1990 in addition to conventional paper procedures.

In this system, six large-scale computers are connected to 1,000 terminals via LAN (Local Area Network) in the JPO. The system also functions as an electronic center to process and digitize patent information. Patent applicants access the JPO online, thus providing a wide network for patent procedures. This computer system consists of multi-vendors in order to utilize technical feature of each computers manufacturers. The system is categorized as follows:

- 1) The Clerical Processing of Applications

The purpose is to increase the efficiency of clerical processing through digitizing acceptance for applications and examination of forms.

Applicants submit their applications via online access or on floppy disks. The contents of application are archived as publication, and are shared to speed up office work. The current system is being developed aiming at conveyance and online access by spring 1993.

2) The Examination System

This system examines applications in order to judge whether inventions or designs are appropriate and apply to patent or utility models. Here it is necessary to search information on similar technology through related technical documents, which can be done fast and efficiently via databases containing related information. Examples of such databases are the comprehensive document database and the F-term retrieval system (a retrieval database) developed by the JPO. A similar system has been developed for designs and trademarks.

3) The Exchange of Industrial Property Information

In addition to internal use at the JPO, the paperless system enables commercial institutions to provide applicants with databases in

various forms—online, laser disks, and CD-ROM. Companies will be able to manage accurate patent information, that is, access convenience to patent information will drastically improve. As an example, in 1990 the comprehensive document database contained 30 million entries of major overseas official publications as well as patent information and utility models applied for after the Meiji era. This database is already put into service, granting remotely-located applicants access via an online network installed at the Regional Bureau of International Trade and Industry (Hokkaido, Tohoku, Kinki, Chugoku, and Kyushu). Furthermore, the Chubu Bureau of International Trade and Industry is, since January 1992, running a similar service. The JPO also plans to accumulate much more information, and now studies the possibilities of using the comprehensive document database for exchanging information with the United States Patent and Trademark Office (USPTO) and the European Patent Office (EPO).

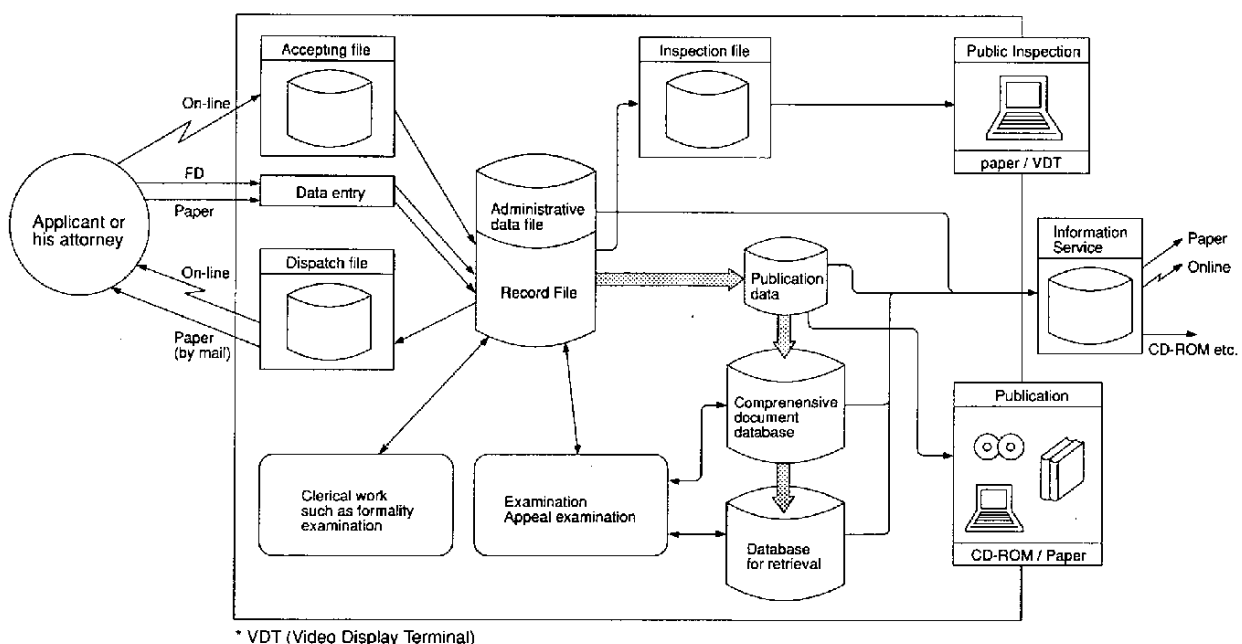


Figure 5-1 Total Image of the JPO Paperless System

2. The Ministry of Health and Welfare

2.1 Information Policies of the Ministry of Health and Welfare

According to the Establishment Act of the Ministry of Health and Welfare, the objective of the health and welfare administration is to "improve and promote social welfare, social security, and public health." This emphasizes the importance of spreading information on health and welfare administration.

The health and welfare administration is active in many fields closely related to daily life in Japan. Therefore, various information needs to be collected in order to promote dissemination of its administrative policies.

The importance of developing information systems has been stressed since 1955. For common business practices, such as handling of social insurances and statistical data, systems have been computerized for efficiency and labor-saving.

Since the 1980s, systematization of information on health and welfare has been accelerated. Also, the administration has started utilizing nation-wide online systems, such as the Tuberculosis and Infectious Diseases Surveillance System, the Information System for the Supervision of Imported Foods, and the Health and Welfare Information System.

As the systematization in many of the fields of the health and welfare administration proceeds, the Ministry of Health and Welfare (MHW) in February 1989 established a committee, chaired by the vice minister, to study information policies for the future direction of information systems.

The "Fundamental Principle of Establishment of Administrative Information and Encouragement of Comprehensive Data Utilization" (improving the functions of planning control and establishment of databases within the ministries) was agreed upon in December of 1987 at the Inter-Ministerial Meeting for Administrative Information Systems. This committee discussed the current status and the issue of health and welfare administration, as well as implementation of specific policies.

2.2 The Databases of MHW

The databases developed by MHW are categorized as follows, according to purpose:

- 1) Databases which support the policies of MHW
 - MHW Database Management System (DBMS) and Decision Support System
 - The Tuberculosis and Infectious Diseases Surveillance System
 - The Information System for the Supervision of Imported Foods
- 2) Databases which support policies of administrative agencies of local public authorities
 - The Wide-area Information-exchange System for Health and welfare administration (WISH)
 - The Support System for Regional Health and Medical Care Project
- 3) Databases which provide support for resident service projects
 - The Welfare and Health Information System

2.3 MHW DBMS and Decision Support System

(1) History

Research expenditures for producing shared databases were budgeted in 1986. Development commenced in 1987, based on the results of research conducted by the Database Committee of MHW. An outline for a basic system was completed, and service commenced in 1989.

(2) Outline

The purpose of KIND (Koseisho INformation service & Decision support system) is to promote office automation in order to increase communication efficiency within the ministry, using bulletin board systems, electronic mail, as well as other shared databases that support decision-making at each level, such as planning, implementation, and evaluation of health and welfare administration policies (see Figure 5-2).

(3) System Construction

The databases are accessed through LAN via terminals connected to computers at MHW.

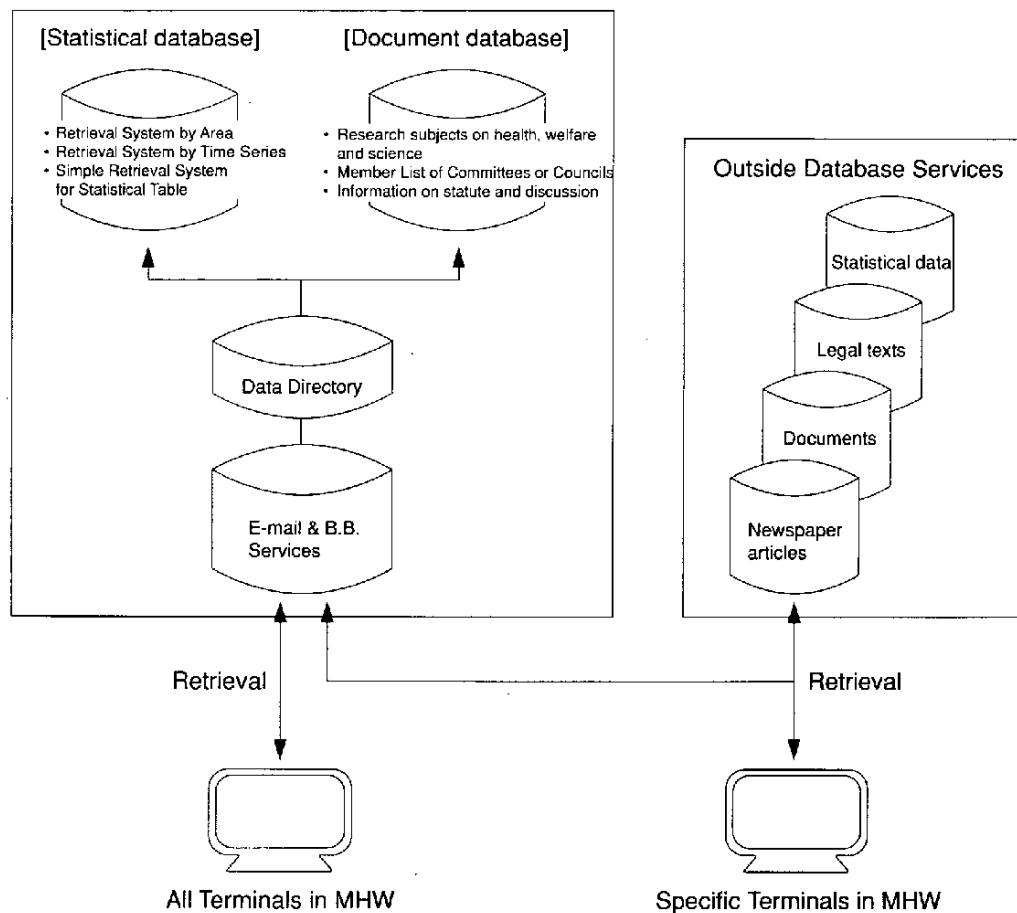


Figure 5-2 The MHW DBMS and Decision Support System

(4) System Contents

1) The Data Directory System

This system, a premise for using KIND, informs on what type of information is available, or which system should be used to retrieve the necessary information.

2) The Common Information System within MHW

General information, such as interpellation plans or general notification, can be retrieved from the Bulletin Board System whenever needed. When documents are prepared with word processors, the system also provides electronic mail services, and sends/opens documents via terminals.

3) The Statistical Database

This consists of three subsystems, the AREA (Retrieval System by Area) system, the TIME (Retrieval System by Time Series) system, and

the TABLE (Simple Retrieval System for Statistical Table) system. The systems download and output retrieval results in the form of drawings, such as graphs or maps.

4) The Document Database

This database contains information on the research subjects on health, welfare, and science, and the member lists of the councils, or the committees of the ministry. Necessary information can be retrieved by keyword.

5) Outside Database Services

Available databases in this category are the Management and Coordination Agency's SISMAL, the Common Information System for statutes and Diet records, JOIS of the Japan Information Center of Science and Technology (JICST), and Nikkei Telecom for information on newspaper articles.

2.4 The Tuberculosis and Infectious Diseases Surveillance System

(1) History

The progress of medical and pharmaceutical research, as well as improved living standards, have significantly reduced the spreading of serious contagious diseases. However, there is a rising importance for taking countermeasures against other contagious diseases that only cause simple complications.

Reflecting upon this situation, the Surveillance of Infectious Diseases was commenced in 1981 through cooperation among prefectural governments, designated cities, and medical facilities. Information was collected on occurrence, and 18 diseases were listed in the beginning; however, this number has risen to 27, and since January 1987 this list also includes information on tuberculosis. Furthermore, an online system, the Tuberculosis and Infectious Diseases Surveillance System, has been introduced for the purpose of returning prevalence information to local public authorities, as well as for collecting their reports on disease outbreaks (see Figure 5-3).

(2) System Construction

- 1) 4,000 medical facilities partaking in this project report how many patients they have per week to local health centers, which are located all over Japan. At the health centers, this information is input via PCs.
- 2) In the prefectural government, workstation are used to collect the above information from the health centers. The data is sent to the Central Information Center for Infectious Diseases, which houses the host computers of the Statistics and Information Department of MHW.
- 3) The Central Information Center for Infectious Diseases collects the data, analyzes the situation, and returns this information to the health centers, located in the prefectural governments.
- 4) Users are limited to access information at the prefectural government, the designated cities, and the health centers.
- 5) A Value Added Network (VAN) is used for on-line access based on non-procedure protocols.

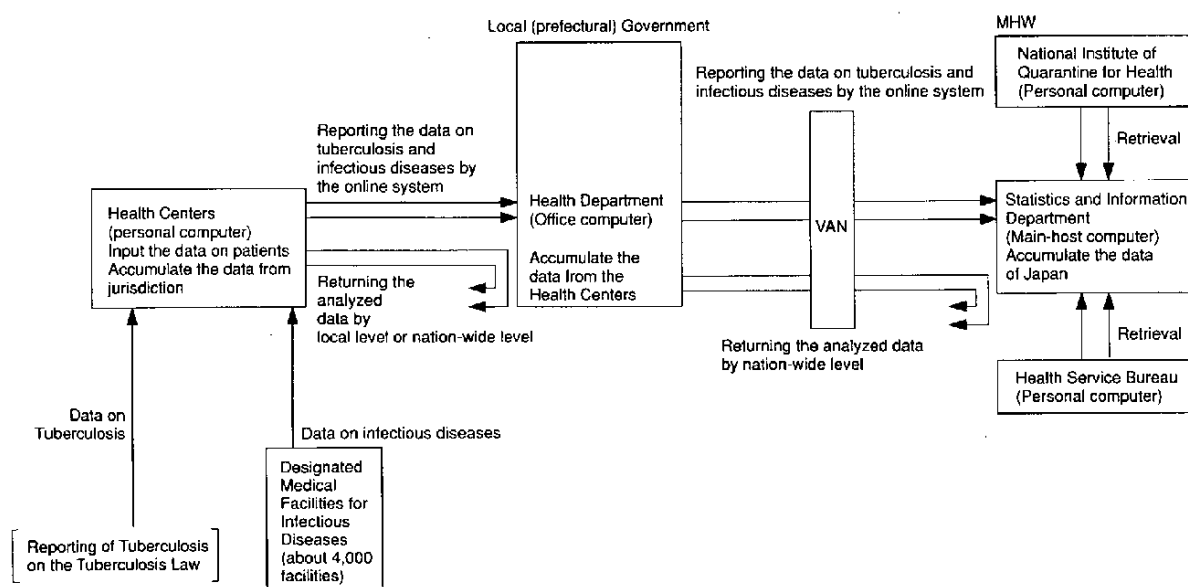


Figure 5-3 The Tuberculosis and Infectious Diseases Surveillance System

(3) System Contents

- 1) Past data can be accumulated again at the Central Information Center for Infectious Diseases.
- 2) Weekly and monthly updates on the situation of recent disease outbreaks, both for the whole nation and for local areas, can be accessed through the database from the prefectural government and designated cities, respectively.

2.5 The Information System for the Supervision of Imported Foods

(1) History

In importing food, importers are expected to submit a notification to the Minister of Health and Welfare through quarantine stations at air- or seaports. Based on these notifications, MHW used to process statistics using OCR forms. The Information System for the Supervision of Imported Foods was implemented in order to meet the demands for the drastic increase in food imports, that is, to internationalize local airports, to rationalize, and to

save time while going through import procedures. MHW got online access to quarantine stations in January 1988. The system was designed to keep records of such information as past achievements in imports and related malpractice. This information can be accessed anytime at quarantine stations where these notifications is accepted (see Figure 5-4).

(2) System Construction

After import notifications are submitted to a quarantine station, investigation is conducted to judge whether the goods can be accepted or not. Relevant information is input at the existing 26 quarantine stations and stored in databases contained in the host computers at MHW. Necessary information can be retrieved at the quarantine stations. MHW is connected to the quarantine stations via VAN, using data communication control procedure level 2B. Users can access this information through the department in charge at each respective quarantine station, and through MHW.

(3) System Contents

The system contains information on, i.e., the

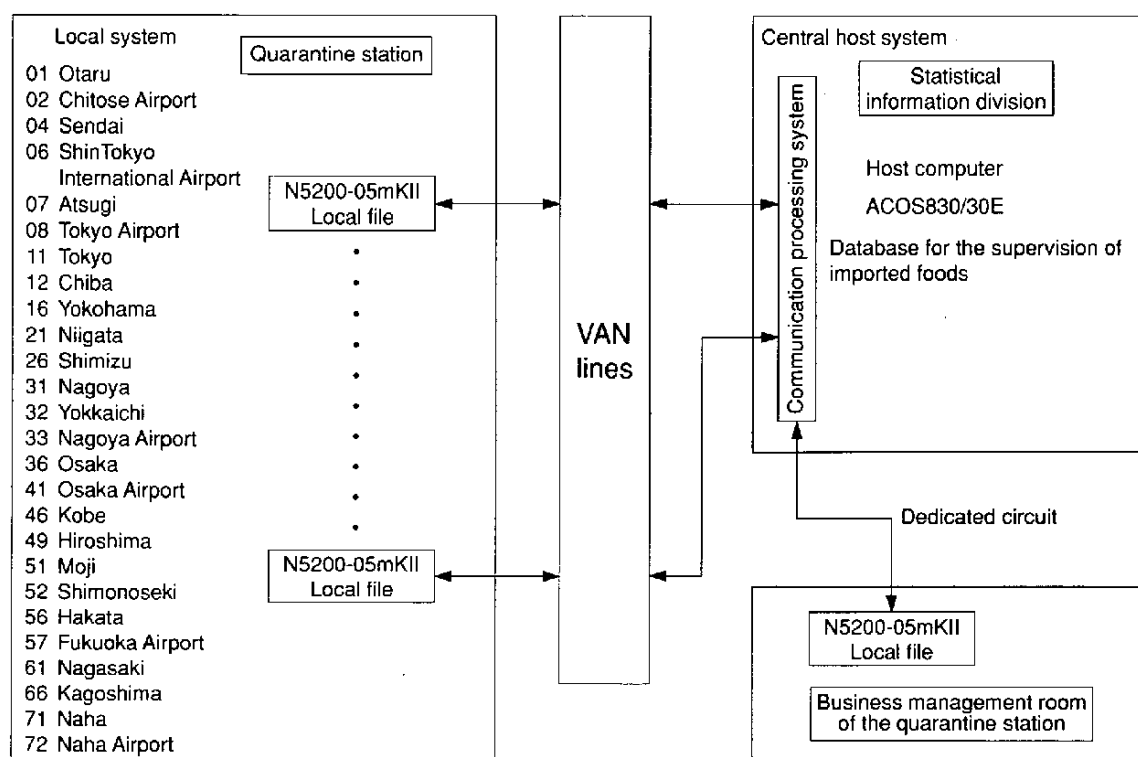


Figure 5-4 The Information System for the Supervision of Imported Foods

names of imported products, the shipping weight of these products, the country of origin, and the results of the above-mentioned investigation.

2.6 The Wide-area Information-exchange System for Health and Welfare Administration (WISH)

(1) Outline

Since the operations of the health and welfare administration are closely related to daily life in Japan, most projects are implemented specifically for each prefectural government. MHW intends to establish information exchange between the government and local public authorities. That is, MHW supports local public authorities with information, and in return collects information from the local public authorities.

(2) System Construction

In connecting MHW with local public authorities, this system uses two subsystems: the Systems for common-use, which will support administrative policies through the setting-up of VAN databases for search by local public authorities, and the Individual

Job Processing Systems for specific projects (see Figure 5-5).

Currently, the Support System for Regional Health and Medical Care Project functions as the Individual Job Processing Systems, which enables MHW to exchange information with prefectural governments and health centers.

This system, called WISH (Wide-area Information-exchange System for Health and welfare administration), is available at the facilities and the agencies of local public authorities, and at MHW. Under special circumstances, qualified personnel can use the facilities for the purpose of promoting administration of health and welfare.

Users can access the system via VAN by connecting their terminals to the VAN center, based on non-procedure protocols for data communication. There are no protocols for data communication procedures. Currently, terminals from the following makers are used: NEC, Fujitsu, Toshiba, NTT, FUJI XEROX, and IBM.

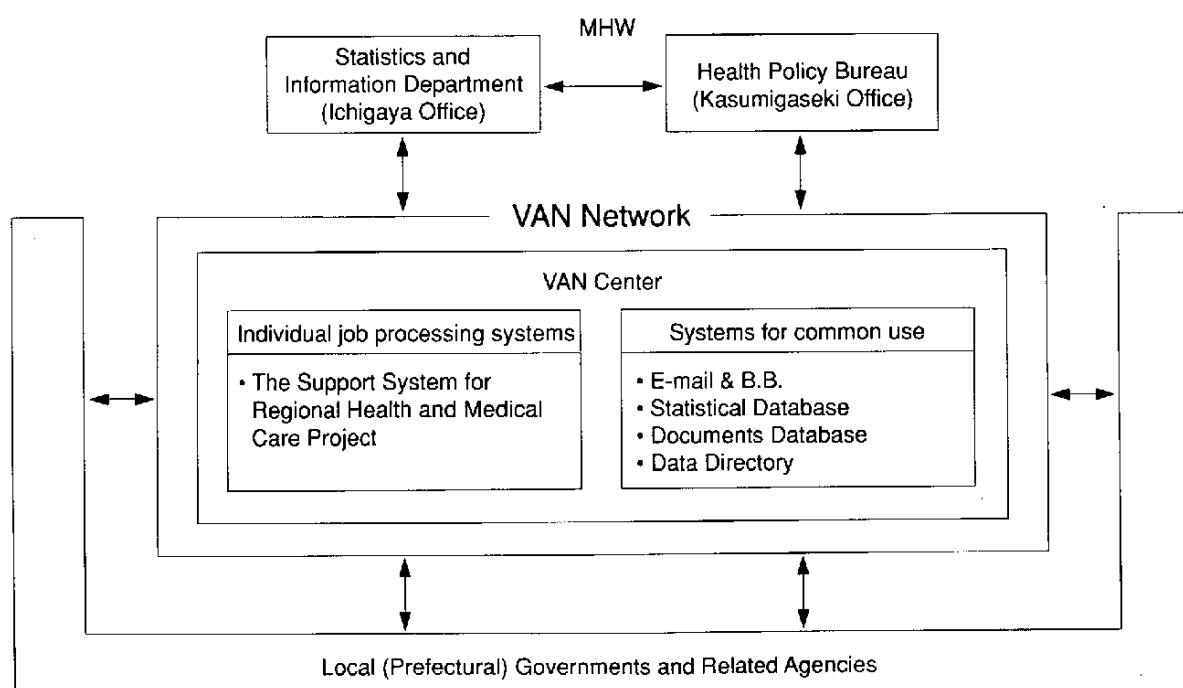


Figure 5-5 The Wide-area Information-exchange System for Health and Welfare Administration (WISH)

(3) System Contents

The system employs the Statistical Information Database and the Document Database.

The contents of the Statistical Information Database are as follows:

- 1) Large amounts of numerical values contained in the results of statistical surveys conducted by MHW. Examples of such statistics are vital statistics, the Comprehensive Survey of Living Condition of the People on Health and Welfare, the Survey of Medical Care Institutions, the Survey of Pharmaceutical Industry Productions, the Patient Survey, the Hospital Reports, the Survey of Social Welfare Institutions; the Survey of Physicians, Dentists, and Pharmacists; the National Nutrition Survey, the Statistical Report on Public Health and Social Welfare Administration Services, and the Report on Statistics of Activities of Health Centers.
- 2) Monthly vital statistics
- 3) The Document Database
 - WISH basic information
 - User's guide, electronic mail address list
 - Guide to MHW
 - List of MHW executives
 - Event schedule of MHW
 - Guide to related agencies
 - List of health centers and welfare offices
- 4) Information can be exchanged via electronic mail between users as well as between users and particular departments of MHW.

2.7 The Welfare and Health Information System (WHIS)

(1) History

The Comprehensive Center for the Elderly was established in 1987 as a three-year nationwide project. This project was based upon a report submitted in April 1986 by the Head Office of the Elderly Measures Plan and Promotion of MHW.

The Social Welfare and Medical Service Corp. started the Welfare and Health Information Service System, and established the Central Information

Center to support the Prefectural Comprehensive Consultation Center for the Elderly, in the prefectural government.

(2) System Construction

The Social Welfare and Medical Service Corp. provides the Prefectural Comprehensive Centers for the Elderly with online information via a nationwide network. The system, called WHIS (Welfare and Health Information System) NET, mainly uses DDX-TP as its online network, and JUST-PC as its protocol for data communication (see Figure 5-6). The system also features menu-driven applications, thus enabling users to set their retrieval conditions on-screen. The host computer is a DIPS-V 30 EX, while NEC, FUJITSU, and RICOH desktop computers are located at comprehensive consultation offices for the elderly in each prefectural government.

(3) System Contents

The WHIS NET currently provides three types of services, that is, a database, a bulletin board system, and electronic mail. Among health and welfare information, the database provides the following five types of information:

- 1) System and policy information, which contains an outline of the measures taken for the elderly by each ministry
- 2) Information on the use of facilities, a category that contains an outline of homes for the elderly, special protective homes for the elderly, low-expense homes for the elderly, health facilities for the elderly, health promotion facilities, rehabilitation hospitals, and publicly-managed accommodations all over Japan
- 3) Information on consultation services, a category that contains processed examples of actual consultation services at the Prefectural Comprehensive Consultation Center for the Elderly
- 4) Information on life-long education, which includes a nationwide correspondence education program

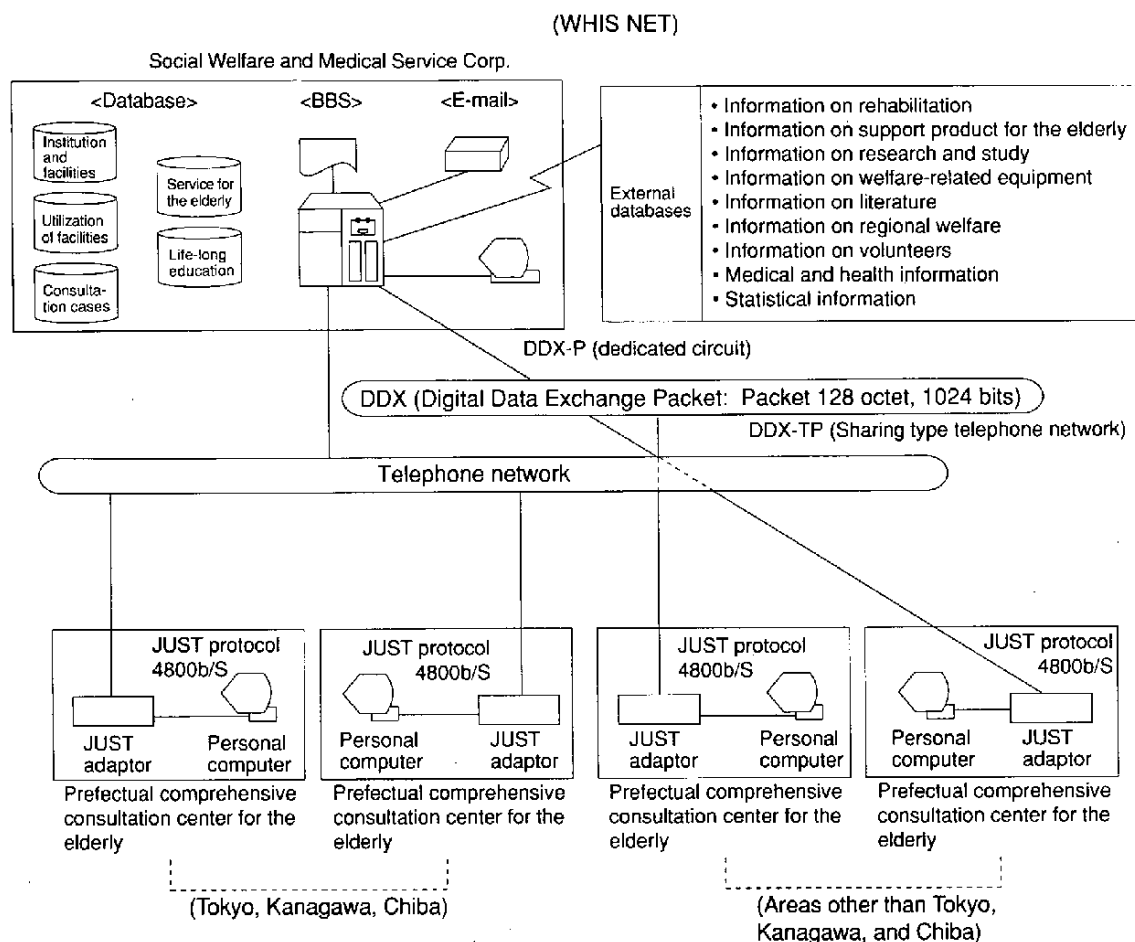


Figure 5-6 The Welfare and Health Information Service (WHIS)

- 5) Information on the Silver Service, which contains an outline of the authorized Silver Mark dealers

The bulletin board system provides statements from MHW available at the correspondents' club, information on newspaper clippings, and information on technical journal clippings. Electronic mail provides information exchange between comprehensive consultation offices for the elderly.

(4) System Expansion Plans

There are plans to expand the network, and information is to be updated and improved. Bibliography on book, equipment related to welfare, and guides to hospitals are to be included in the

information. As for the network, the Prefectural Comprehensive Consultation Center for the Elderly is to take a central role in every prefectural government, and the possibilities of online access to these centers are under examination.

2.8 Future Issues

Facing the situation of an aging society, it is necessary for the government and local public authorities to narrow the gap between its residents and health and welfare activities. Therefore, a system that allows information activities to develop smoothly must be established.

3. The Ministry of Agriculture, Forestry, and Fisheries

3.1 Introduction

Agriculture, forestry, and fisheries perform the vital function of ensuring the stable supply of food and other very basic necessities to the nation. Furthermore, they provide the foundation for the society and its economy by contributing to the formation of sound local communities, conservation of national land and its natural environment, and so on.

In the early 1960s, however, Japan got into the period of the so-called High Economic Growth, and saw an extensive population drift from the provinces to the main cities, triggering depopulation in villages in farmland, highland, and coastal regions and thus seriously losing the productivity of its agriculture, forestry, and fisheries.

To cope with the situation, the Ministry of Agriculture, Forestry, and Fishery (MAFF) has been taking active measures, including those to overhaul and reinforce these industries through structural reform, demand increase, price stabilization, etc., and also those to vitalize farming, forestry, and fishing villages by bringing and keeping their living environment in good condition.

In making decisions for planning and formulating such administrative measures, it is essential to analyze the current circumstances from various viewpoints, using multiple sets of data and information.

In order to accumulate the comprehensive information needed to facilitate and speed up the decision-making process for such measures, MAFF has constructed and is maintaining several databases of different sizes in some of its bureaus. At the same time, the ministry has adopted a series of information-oriented policies to go ahead with the above-mentioned industry/community vitalization measures.

This chapter presents some brief descriptions of the ministry's databases, taking a couple of them as examples, both from those used internally within the ministry and those used for the industry/community

vitalization measures.

3.2 In-house Databases

MAFF has two communal computer systems; namely, the "Joint-Use Computer System (HITAC M-660)," maintained and administered by the ministry's Statistics and Information Department, and the "Computer Center for Research Related to Agriculture, Forestry, and Fisheries (ACOS 930/20)," maintained and administered by the Tsukuba Office of the Research Council Secretariat of the Agriculture, Forestry, and Fisheries.

The former is for joint use by the ministry itself and its regional offices (seven offices plus the Statistics and Information Office), while the latter by research institutes of agriculture, forestry, and fisheries nationwide. Each of these systems has its own online network.

The balance of this section presents an overview of the databases on these computer systems.

(1) MAFF Statistical Analysis and Retrieval System

This system, commonly called "MASTERS," was developed to provide easy and instant access to any detailed statistics needed for formulating and implementing an administrative measure in exact accordance with the purpose of the measure and with the realities of the locality.

The database of the system covers not only MAFF statistics. It contains FAO and other overseas statistics as well as text information on the actual state of agricultural, forestry, and fisheries production activities across the nation.

Access to the MASTERS system is provided via online terminals installed at the ministry and the regional offices. The user can search the system, and retrieve, process, and analyze the desired data online to obtain forecasts, graphs, and printouts.

There are plans for further improvement and extension of the system, such as to enable

- 1) access via PCs,
- 2) downloading of retrieved data to the user's terminal, and

- 3) more efficient accumulation of data.

(2) MAFF Administrative Information System

This system has a twofold purpose; namely, to allow each section of the ministry to make the most of the latest information for planning its administrative measures, handling Diet affairs, etc., and to provide more efficient liaison between the sections.

The most frequently updated information items on the system include Diet information, reports on agricultural administration and economy, press releases, statistical bulletins, etc. The input of each of these items is done by each different section of the ministry, using a highly efficient image input method.

(3) Agriculture, Forestry, and Fisheries Research Information Service System

In contrast to the systems in the above (1) and (2), which are designed for use by the administrative sections of the ministry, this database system is intended to serve the needs of the ministry's affiliated research institutes.

The database of the system contains a comprehensive amount of literature information on research activities and findings, whether domestic or overseas, aiming to help facilitate R&D in the fields related to agriculture, forestry, and fisheries. Examples of the information available on the various database units of the system include

- 1) agricultural research literature made public by the FAO or by private organizations overseas,
- 2) Japanese-language articles taken from domestically published literature on agriculture, forestry, and fisheries, and
- 3) literature on life science and other related fields.

(4) Databases of Individual MAFF Sections

- 1) Owner-Operator Farmers' Property Data Management System

This database system contains on the latest information on state-owned property (land-owning farmers' property) pertaining to the Special Account for the Enhancement of Agricultural Management on a field-by-field basis, aiming at expediting disposition of and rationalizing management of such property.

- 2) Geographical Information System for the Farmlands

This system provides a systematic region-by-region collection of survey findings concerning the state of land utilization, the activities of consolidating the agricultural infrastructure, etc. The purpose is to promote such consolidation activities systematically and effectively as well as to secure high-productivity farmlands. The system is also used for preparing various types of documentation to meet the varying needs.

- 3) Administrative Information System for Farmland Improvement Projects

This information system keeps track of the work flow of each agricultural infrastructure construction project (i.e. the preparatory survey, planning, designing, execution, and management) in order to help rationalize the implementation of such projects.

3.3 Agricultural Industry/Community Databases

MAFF is actively taking measures to encourage the agricultural, forestry, and fisheries industries and communities to have and utilize computerized information systems, the objective being the promotion of those industries as well as the vitalization of the communities.

These measures can be roughly divided into three groups;

- 1) those intended to assist local public authorities and agricultural cooperatives in acquiring computers and other equipment needed to have or improve such information systems,
- 2) those intended to contribute to the establishment of information systems for the vitalization of regional communities by conducting surveys and studies and providing information necessary, and
- 3) those intended to contribute to a more efficient operation of farm insurance schemes.

This section describes some of the measures in this second group.

(1) Promotion Project for Information Systems in Rural Areas (Greentopia Project)

Keeping pace with the increasingly information-oriented society, this project started in 1986 with the aim of promoting and encouraging utilization of computerized information systems and new media by agricultural, forestry, and fisheries communities, thereby enabling the communities to increase their industrial productivity, rationalize product distribution, and get more vigor. In the project, efforts are made to conceive and define a range of pioneering and exemplary information systems and to publicize their usefulness and economical efficiency.

Picking out several districts with good information needs and public awareness of the necessity of computerized information systems and, at the same time, with much enthusiasm for having or improving such systems on the part of the local administrative bodies and trade associations and business firms in the related industries, MAFF has designated some model areas (53 areas during the three years from 1986 to 1988) and provided subsidies and guidance to these model areas for implementing their local information system projects.

Since the implementation of such local projects is to be funded basically with private capital, a supportive scheme has been made available, in which an interest-free loan is provided for consolidating social capital using the proceeds of the sale of NTT stock shares.

(2) Rural and Agricultural Information System (RAIS)

The ever growing need for information in the society is arousing demand for more and more government-owned data to be distributed to or made accessible by the private sector and more and more public databases to be constructed. The RAIS system was created amid these circumstances in order to help local public authorities and agricultural organizations plan their agricultural industry/community promotion programs and make decisions about them in an effective way.

The system is operated and maintained mainly

by the Association of Agriculture and Forestry Statistics. The nucleus of the system is a database containing diverse statistics and administrative information. Users of the system, local public authorities and agricultural organizations, connect their terminal to the system's host computer online via dedicated VAN lined and retrieve, process, and download the information they require.

The contents of the database are grouped into:

- 1) full statistical reports: agricultural, forestry, and fisheries statistics released by MAFF plus key statistics released by other ministries,
- 2) statistical bulletins: bulletins of agricultural, forestry, and fisheries statistics released by MAFF,
- 3) agricultural policy information from MAFF: information related to agricultural policies, such as press releases, commentaries on major agricultural programs, etc., and
- 4) general agricultural information: regional information on agricultural industries and communities, plus agricultural literature and journal articles.

(3) Information Exchange Network System (Furusato Net)

An increasing number of people living in urban areas are said to have a strong inclination toward "furusato" (one's homeland or rural towns and villages in general). Furusato Net is a PC communications network system designed to facilitate communication between rural and urban areas, thereby meeting the needs of those furusato-oriented city-dwellers and contributing to the vitalization of rural communities. At present, the system contains some 50,000 pieces of "furusato" information sent from across the nation to the Information Center.

The system stores this abundance of information in its database, so that it can be utilized more efficiently. In addition, the system's PC network makes information exchange easier and thus serves to improve the quality and timeliness of the information in the database. The system has been in operation since 1991.

Users of this system include not only local public authorities and agricultural, forestry, and fisheries organizations, but also various other groups and business firms. The system connects them via PC network and enable them to exchange information by adding new information to the database or updating or retrieving information in the database. Furthermore, there are plans for setting up a videotex network to connect center terminals, commercial-product museums and travel bureaus nationwide and provide information and consulting services.

The contents of the database are classified into several categories; information about local specialties and events, explanations of the Furusato Membership, stories of experiences in local life, reports of town/village vitalization efforts, examples of exchange between urban and rural communities, furusato information for urbanites, and so on. The number of the content categories is scheduled to be increased gradually.

The system also has bulletin board and electronic mail capabilities, which allow the members to exchange information among themselves.

(4) Value Added Network for Agricultural Extension Services

Constant sophistication of agricultural technology, increasing specialization of farm management, and a growing number of farmers doing farming as a sideline—spurred by these factors, the agricultural industries and communities of our country are changing rapidly and extensively, and a demand is building up for appropriate and effective technical extension and guidance activities.

To address this situation, the National Association of Agricultural Extension Services, through its Extension Information Center, has been collecting and accumulating information on farming technology, technical extension and guidance activities, and agricultural administration. The association has also been providing such information in the form of a list to Agricultural Improvement Extension Stations nationwide, either periodically or on request.

This system is a PC-based network system

aimed to allow the Extension Information Center to swiftly provide the related organizations across the nation with information necessary for their technical extension and guidance activities. The system also serves to facilitate exchange of information on technical extension among the organizations concerned.

The contents of the center's database include:

- 1) the latest news on the domestic and overseas agriculture and agricultural administration, together with information of various support programs,
- 2) reports on the results of studies done by national research institutes and information on agricultural and other related materials,
- 3) statistics of agricultural production, distribution, consumption, etc., and
- 4) headline information for on-the-spot reports of technical extension activities.

Owing to this system, many Agricultural Improvement Extension Stations have been successful in providing administrative and managerial guidances to local governments and agricultural cooperatives and in extending technical and managerial information to farming households and producers' organizations in a prompt and appropriate way.

(5) Agriculture, Forestry, and Fisheries Technical Information Network System (AFFTINET)

In the fields of agriculture, forestry, and fisheries, R&D for the improvement of productivity and plant/animal breeding is being done very actively by the industry, the government, and the academic community.

In recent years, the application of bio- and other pioneering technologies has led to new technological developments in these fields and has also accelerated the pace at which a product of a fundamental study is reduced to a practical application.

These changes in R&D environments have prompted the realization of the necessity to join and closely link the hitherto independent research activities of the above three sectors.

Along this line, the Food And Agriculture Research and Development Association built this AFFTINET system and put it into operation. The system aims at further raising the overall technological standards in the fields of agriculture, forestry, and fisheries by offering online access to information on national research institutes' research outcomes and support programs and by facilitating information exchange among subscribers to the network.

The online access to the system is provided via the most popular of the commercial network service, PC-VAN. The services available on the system include information on the organizations and events of MAFF and the national research institutes, information on research results and high-technology, reports of

activities of academic circles and private organizations, electronic mail, and a bulletin board service to enable information exchange among members.

The database systems described so far are examples of major agricultural industry/community database systems connecting central and local entities. Beside these, several systems are currently under construction; namely, the "Information System for Forestry Extension Services" to cover forestry information and the "Information System for Fisheries Extension Services" to cover fisheries information. In addition, active support measures are being taken for the construction of databases that collect more locally oriented information and offer access to it via PC communications.

4. The Ministry of Labor

4.1 A Changing Labor Environment

(1) Quantitative and Qualitative Changes Within the Labor Force

The labor force situation is rapidly reaching a turning-point, at which both quantitative and qualitative changes are foreseen: 1) considerable labor shortage is imminent, due to the dwindling working age population, and 2) the ratio of elderly against the total population steadily accelerates, women are disseminating into the labor market, nativity is on the decrease, and, in becoming more aware, people are changing their attitude towards work. These changes are believed to greatly influence the national economy, society, industry, and corporate situation; in short, life in Japan as a whole is due for an overhaul.

In order to appropriately deal with these changes, to maintain the vital power of the Japanese economy, and to stabilize the growth of the nation, it is necessary to reconsider the fundamentals of an economy supported by an abundant labor force, such as personal and labor management, conventions, and basic awareness. Furthermore, Japan must start fulfilling its responsibilities according to its international position, as well as partake in cooperative activities as a member of the international society.

(2) Policies for Dealing with Various Labor Problems

The above mentioned changes call for a review of the entire structure of the economical influence on each labor field. Problems are many and complicated; rethinking is needed in the fields of personal and labor management, traditional labor customs, using women and elderly as part of the labor force, and development of human resources. Since it is difficult for corporations and their employees to tackle these problems by themselves, a comprehensive policy for labor administration is necessary.

(3) The Necessity of a System for Gathering and Supplying Labor Information

In order to deal with various and complicated labor problems, it is crucial that information is handed

down through the hierarchy to reach corporations and laborers. This information includes the current status of labor problems, future prospects, various issues, administrative directions, specific corporate and administrative support measures, personal and labor management, the situation of using women and elderly as part of the labor force, and human resources development.

However, due to the technical nature of this information and the technology needed for retrieval, it is difficult for laborers to access and use this information.

Therefore, in order to enable laborers to easily grasp and use this data, it is necessary to establish a system that offers means to systematically gather, arrange, and process this information. Dissemination of this system is equally important, in order to quickly supply comprehensive information to a large number of people.

4.2 Examining the Establishment of a System for Gathering and Supplying Labor Information

The Ministry of Labor supports gathering and supply of information, as well as consultation through organizations related to the Ministry of Labor. Furthermore, the Studying Committee for Labor Information Center Plan (tentative name) was established in 1990 by the Japan Institute of Labor to examine the possibilities of setting up a system for gathering and supplying labor information. Special public corporations, supervised by the Ministry of Labor, have been assigned to comprehensively examine labor problems and to collect, arrange, and supply labor information and references (see Figure 5-7).

The following recommendations, called the Labor Information Center Plan, have been established based on the committee's research. This Labor Information Center shall:

- 1) perform a wide range of satisfying consultation by providing information on organizations related to the Ministry of Labor and by supply-

- ing necessary labor information via network,
- 2) accumulate labor information and supply users with value-added information,
 - 3) seek to utilize private VAN services that add convenience and help increasing the number of users,
 - 4) seek to establish a system that supports users by incorporating audio-visual and bibliographical references, and
 - 5) seek to improve the existing system that extends information to overseas interest groups.

Based on the recommendations submitted by the Studying Committee for Labor Information Center Plan, the Labor Information Center Experts Committee, consisting of scholars, managers, laborers, and government officials, was established in 1991 by the Japan Institute of Labor to thoroughly examine professional or technical problems, user opinions, and to promote research and exchange of opinion.

4.3 Outline of the Labor Information Center Plan

(1) Objective

In order to solve the many and complicated labor problems, it is essential to establish a system for gathering and supplying labor information, and to enhance the consultation and support functions of organizations related to labor problems.

Considering the above, the Japan Institute of Labor will establish the Labor Information Center in order to improve the system for gathering and supply of labor information, to meet the need of laborers, as well as to heighten the quality of consultation and support provided by organizations related to the Ministry of Labor.

(2) Function

1) Networking the organization related to the Ministry of Labor

Currently, labor-related information is collected,

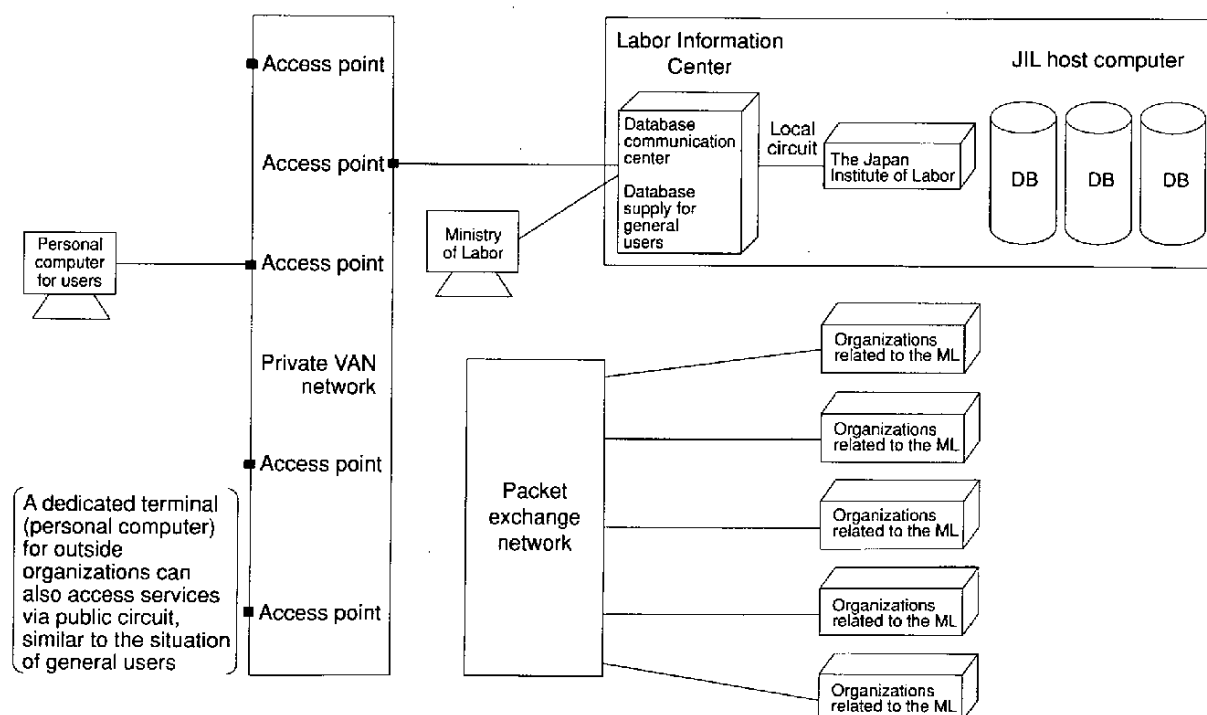


Figure 5-7 Outline of the Network of the Labor Information Center (Tentative Name)

processed, and provided at each consultation office at the Japan Institute of Labor, the Employment Promotion Projects Corporation, and the Central Vocational Ability Development Association. This information will be shared through the networking of each database, and promoted for the utilization of these. This will result in improving and reinforcing information handling at the consultation windows of the organizations related to the Ministry of Labor.

2) Supplying more value-added information

Databases developed by organizations related to the Ministry of Labor are installed and currently in use at each consultation office.

In order to solve the even more diversified and complicated labor problems of the future, labor information needs to be accumulated to meet user needs, and must be supplied to these users with a highly added value for convenience. For this purpose, organizations related to the Ministry of Labor must develop and provide more value-added information in cooperation with each other. Furthermore, more advanced services can be provided by sharing the knowledge and accumulated experience of each organization related to the Ministry of Labor.

3) Supplying information via VAN

Against a background of drastically improved information and communication technology (especially, the dissemination of computer devices among business people and others), an increasing number of users tend to seek access to information via online systems. Moreover, not only final reports, but policy-making information as well, should be intelligibly supplied to all laborers. To grasp all the facts correctly, it is also important to dust off the discussion on nationwide policies.

To solve the dilemma of what information can be revealed and what cannot, information could be provided via VAN. This would also make it easier for laborers to access whatever information they are entitled to. As a result, services

would be further enhanced.

Another merit would be that users residing in remote locations could, via VAN with access stations all over Japan, access labor information just as easily as their counterparts in more central areas. Furthermore, the potential demand for labor information is expected to be stimulated by the drastically increasing number of users, and the utilization of VAN that provides easy access.

4) Collecting and arranging audio-visual and bibliographical references

As do databases, audio-visual and bibliographical references contribute to the supply of labor information. However, there are no means for systematic collection of these references, in spite of active development and their significantly raised importance. Therefore, the Labor Reference Library and the Labor Materials Library must become more sophisticated. In fact, the systematization of this collection and the tools for collecting these audio-visual and bibliographical references are to be improved, and more systematic supply of valuable audio-visual and bibliographical references will be implemented.

5) Supplying labor information to foreign countries

Since Japan has become more internationally important, international exchange has duly increased, and foreign countries are becoming more and more interested in Japan. As a result, overseas interest groups demand information on labor problems in Japan. However, the system for supplying or collecting labor information for foreign groups of interest is inadequate. Also, consultatory functions, as well as collection and supply of references, need to be improved.

4.4 The Labor Information Center Plan

Through cooperation among labor-related organization, the current system and techniques should be examined. This is due to the nature of the Labor Information Center Plan, which is based on the

networking of the databases produced by the organizations related to the Ministry of Labor.

There is still plenty of room for examining problems: VAN utilization, legal aspects of related information, and correct understanding of the needs of overseas interest groups.

Examining the establishment of the Labor Information Center is a step-by-step process. A five-year project, this research was started in 1992 and will last until 1996. A preparatory office will be set up during 1992-93 to thoroughly examine the establishment of the Labor Information Center.

In 1992-93, the Labor Information Center Preparatory Office will be established. In 1994-96, the Labor Information Center will be established, and organizational activities will commence as soon as the organization is established.

4.5 Tentative Problem Solutions

The Labor Information Center Preparatory Office will be established by the Japan Institute of Labor to prepare communications networks for connecting the various organizations related to the Ministry of Labor, as well as to work for multilateral adjustment. At the same time, the office will seek to establish the Labor Information Center and conduct fundamental investigation for the development of the network system.

An outline of the tasks assigned to the Preparatory Office for Labor Information Center

The following tasks will be carried out in 1992.

- 1) Examination of the functions and specific services of the Labor Information Center
- 2) Establishment of the Planning and Promotion Committee

Since the concept of the Labor Information Center is based on the databases developed by the organizations related to the Ministry of Labor, comprehensive examination and close communication among the organizations are crucial factors. In regard to this, the Planning and Promotion Committee—consisting of information supply trustees of each respective organization—will be established to promote communication among the related organizations and examine the establishment of the Labor Information Center.

- 3) Establishment of a specialist committee

This committee, consisting of objective third-party specialists, will be set up in order to examine the contents of various labor information and the supply of highly value-added information.

- 4) Fundamental research on the system of the Labor Information Center

The establishment of the Labor Information Center activities will be examined, including technical research on networks.

5. The Ministry of Construction

5.1 Construction Administration and Computerization

In the highly advanced information society of today, people's lives and regional societies are substantially influenced by the role of information infrastructure as the new social overhead capital. Thus, in its own jurisdiction, the Ministry of Construction has engaged in the development of a computerization policy to cover a wide area.

In maintaining and improving its information facilities and systems, the ministry is now taking the following core measures.

- 1) Maintenance and improvement of information networks that utilize public facilities, such as public roads, and highways (e.g., so-called information highways, cab systems)
- 2) Maintenance and improvement of cities and buildings that utilize information systems (e.g., so-called intelligent cities, intelligent buildings)
- 3) Repletion of the system for collecting and supplying public information, such as information on traffic, prevention against disasters, construction, etc.
- 4) Repletion of the system for management and supply of geographical information—the most fundamental information on the national land.
- 5) Improvement of public facility management through utilization of information systems.
- 6) Improvement of the management of construction administration and administrative services through utilization of information systems.
- 7) Improvement of the management of the construction, real estate, and other construction-related industries through utilization of information systems.

The measures listed as 3)-7) require database production for effective use of information systems. In the following section, we will take a look at the utilization state of the most important databases maintained by the Ministry of Construction and its

related organizations.

5.2 The Situation of Database Production at the Ministry of Construction

(1) Traffic Information

Capitalizing on vehicle detectors, ITV, and meteorological observation equipment, the Traffic Information System quickly grasps necessary information for managing public roads, and supplies bird's-eye view information via online networks. Then the system supplies appropriate information to drivers on the roads through a remote-controlled road information board, after adding necessary data to the original information. At present, this system is adopted on freeways and main trunk roads that support this type of system for gathering and supplying information.

The information is also presented to related organizations. The Japan Road Traffic Information Center (ROADIC) exclusively deals with this information and information provided by the traffic police, passing it on to automobile drivers through radio broadcasts, etc.

In coping with driver needs for traffic information, the Ministry of Construction plans to improve the Traffic Information System by introducing car-navigation systems and by furthering the Vehicle Information & Communication System, which enables various information communication services.

(2) Information on Rivers and Basins

To prevent and alleviate disasters brought about by floods and droughts, two measures are to be taken. One is hardware-related, and serves to promote maintenance and improvement of equipment for flood control and irrigation facilities. The other is software-related, and serves to promptly and appropriately gather information on rivers and basins, such as regional precipitation and water levels; this information will first be used for basic management of rivers and basins, and then for extensive public information.

For the purpose of implementing the software-oriented measure, maintenance and improvement of the River and Basin Information Management System

is underway through real-time collection of information from the following observation posts, as of December 1991.

- 1) 19 radar rain gauges operated by the Ministry of Construction
- 2) Approximately 3,200 telemetering rainfall and water-level stations operated by organizations related to the Ministry of Construction
- 3) Approximately 1,000 telemetering rainfall and water-level stations operated by prefectural governments

Accurate information on rivers and basins can help to fend off disasters. Therefore, this information should be correctly conveyed to people, leaving no room for misunderstandings. To achieve this, it is necessary to centralize information transmission routes. Hence, the Foundation of River & Basin Integrated Communications, Japan (FRICS) was established in October 1985 as an organization that provides the general public with information on rivers and basins (in a later section, the contents of the information offered will be explained in detail).

(3) Map Databases

The Ministry of Construction steadily produces various types of topographical maps containing basic data, in order to grasp the current situation of the national land. In recent years, various institutions and administrative organs have raised their demands for digitization of the information inscribed on the face of the maps, in order to render it processable with computers. Therefore, the ministry now producing an array of map databases (see below), which are expected to be extensively available for analysis of specific situations in various regions, for development programs, for disaster prevention plans, etc.

1) The National Large-scale Map Database

The National Large-scale Map Database incorporates national large-scale maps on a 1/2,500 scale, results of public surveys conducted for the production of city planning maps, and topographical maps on a 1/10,000 scale.

Maps scaled at a 1/10,000 rate are being created for regions such as Kanto, Kinki, and several

other local cities. Thus, the development of this database is supposed to proceed with the degree of preparation of these topographical maps. The Ministry of Construction plans to supply this database on magnetic tape some time in 1992.

2) The Digital Large-scale Map Information Database

The Digital Large-scale Map Information database contains fundamental information on topographical maps scaled at a 1/25,000 rate. This information has been recorded, arranged, and systematized in the form of numerical data, and these maps are considered the most exact among similarly standardized maps that geographically cover all of Japan.

The fundamental information of this database includes administrative boundaries, contour lines, and water systems. Almost all of the nation's administrative boundaries have been incorporated into the database, and so far, the contour lines of the Kanto area and some other areas have been finalized. A database containing information on the contour lines of the Kanto area will be available some time in 1992.

3) The Digital National Land Information Database

Based on geographical standards for the Japanese geography, the Digital National Land Information Database stores various geographical data, such as information on topography, water systems, traffic facilities, land utilization, designation of districts for city planning projects, land prices, etc.

In principle, this information is input in the form of topographical maps scaled at a 1/25,000 rate for grid localization. The standard grid unit for localization is 1 km².

Since 1974, the Ministry of Construction has in cooperation with the National Land Agency maintained and improved this database. At present, the database is close to perfection, and mere data updates are needed to protect it from becoming obsolete.

The database is currently available to public

organizations through the Japan Map Center; on an experimental basis, some services are also extended to the general public.

(4) Other Databases Retained by the Ministry

Other than the above, the Ministry of Construction develops various types of databases in order to contribute to the effectuation of public facility management, and to improve administrative work and services. Unless stated otherwise, the databases described hereafter are utilized via terminals within the ministry.

Regarding databases that help to rationalize facility management, the development of the Road Control Database is making particular progress. The primary contents of the database are relevant information on the road situation, for example road structures and road facilities as cited from the "Road Register." Taking advantage of this database, the ministry is currently executing various tasks, such as effectuation of road management (e.g., handling of traffic accidents), provision of proper information for automobile drivers, improvement projects, establishment of road management policies, and support of research related to road maintenance.

The four databases listed below are being created in order to effectuate administrative clerical work.

The first database is intended to support technical decision-making through the use of information on geology, water quality, hydraulics and hydrology, technical literature, International Road Research Documentation (IRRD), etc. Among this information, some IRRD has already been extended to the general public via the Japan Information Center of Science and Technology (JICST).

The second database contains information on the maintenance and improvement of regional districts, and is intended to support regional development projects. Stored in this database is systematically arranged information on each regional project, basic indicators of regional economy and society, and other up-to-date information on the maintenance and improvement of regional districts. Among these

contents, major project information is now at the general public's disposal through JACIC NET, which will be discussed further in a later section.

The third database supports rationalization of the ministry's office chores. So far, the Management System for Budgetary Execution of Construction Projects and Cost Integration System for Engineering Works have been employed, with related data has gradually accumulated.

The fourth database is intended to improve administrative services by effectuating clerical formalities in issuing governmental permissions and official licenses. Currently being developed is a database intended to ease the issuance of official permissions such as for special car passage, road occupancy, opening up construction businesses, building lots and buildings transaction business, and registration of the license holders, registration of surveyors and assistant surveyors, registration of licensed architects, etc.

5.3 The Situation of Database Production Related to Construction Administration

Organizations related to the Ministry of Construction are currently producing the following databases in order to optimize and spread the use of information related to construction administration, and to contribute to the advancement of activities related to the construction industry.

(1) JACIC NET

The database of the Japan Construction Information Center (JACIC) contains various construction-related information. This information was originally stored by the Ministry of Construction, its related organizations, and by local public bodies. Now, however, JACIC extensively supplies this data to the general public for effective utilization.

Through online network, the database, called JACIC NET, was first put in service in November 1988. As of December 1991, the number of information entries available through the network stands at 35, including the "Quick report of the budget for public

works," annually augmenting the amount of entries (see Table 5-2).

The number of members with online terminals runs up to approximately 1,250 as of December 1991.

(2) FRICS

The Foundation of River & Basin Integrated Communications, Japan (FRICS) gathers, processes, and arranges river and basin information in order to alleviate flood damage. FRICS handles various other related information under the hands of Ministry of Construction, and also provides the general public with this information.

FRICS commenced information supply services in June 1991.

The followings are the main information entries available through the system.

- 1) Radar rainfall data, e.g., information on precipitation at each location throughout the country
- 2) Telemetering rainfall information, based on observations at each local observation station
- 3) Telemetering water-level information, based on

observations at each local observation station

- 4) Dam information, e.g., information on the amount of discharged water
- 5) Snow information, e.g., radar snowfall data, point snow accumulation
- 6) Disaster information, e.g., flood-defense warnings, flood forecasts
- 7) Central news, e.g., news related to rivers and basins

Through utilization of a videotex system that is in around-the-clock operation throughout the year, this information is transmitted to end users with special terminals via public telephone lines, with nine major transmission centers located in Tokyo, Osaka, Nagoya, and six other large cities. These centers handle the information, and dispatch it to local cities and towns. Radar rainfall data and telemetering rainfall and water-level information is provided online in real time.

The present number of end users nationwide runs up to about 2,800, and approximately 6.5 million screen pages were output in 1990. Service distribution by month shows that the inundation season in Japan,

Table 5-2 Information Available through JACIC NET

1. How to use JACIC NET	13. Regional project information	25. Achievements of research on construction engineering
2. Today's news	14. Regional information on construction	26. Certified commercial technology
3. JACIC news	15. Regional promotion policies	27. Introduction of audit cases
4. Quick report of personnel administration	16. Statistics of commenced civil and architectural engineering project	28. Books on construction
5. List of executives of the Ministry of Construction	17. Percent age-ratios of the civil engineering project costs	29. Journal articles on construction
6. Quick report of the budget for public works	18. Price of principal materials	30. Corporate profits of consulting companies on construction
7. Quick report of the order acceptance of public corporations	19. Construction materials	31. Who's who of official authorities concerned with construction
8. Quick report of the order acceptance of local public authorities	20. Tunnel	32. The offices of official authorities concerned with construction
9. Locations due for public works in the present year	21. Dam	33. Bulletin board system
10. Introduction of nation-wide projects	22. PC bridge	34. Electronic mail
11. Statistics information on construction	23. Steel bridge	35. TSR-BIGS corporate information
12. Market conditions of materials	24. Recent construction method	

usually from April through October, sees about 80% of the annual amount of information retrieval.

(3) The Blank Map Database (JACIC TOWN)

The Japan Construction Information Center now maintains, improves, and supplies a general-purpose blank map database, adopting the city planning base map on a 1/2,500 scale as the basic survey map.

The development of the database proceeds with the permission of local authorities, based upon the provisions of the Survey Law.

The database includes 7 main items—roads, railways, buildings, composition and small objects, administrative boundaries, shorelines, and topography—which are subcategorized in 67 layers. Highly flexible media for data exchange also provides users with a common basis for standardizing map information.

Until now, this database service has been adopted for 48 cities, a single town in Hokkaido and 10 other prefectures; included is information on cities such as Sendai, Yokohama, and Nagoya. The database service is henceforth expected to serve as a basis for managing various types of public-space information, such as urban planning and customer information control systems in local districts.

(4) The Digital Road Map Database

Today, information on public roads is more complicated and diversified than ever. Therefore, maintenance and improvement of databases based on standardized road networks and road maps has become exceedingly important; especially urgent issues are the dissemination of car-navigation systems and the technical advancement of road-construction plans and road management.

The digital road map database contains numerically recorded road-map data and various information on road networks and traffic; the purpose of the database is to make the most effective use possible of road map information. The Japan Digital Road Map Association has handled the database since 1988.

Until now, available from the database is information on

- 1) The locations and the configurations of roads administered by prefectural authorities and the government, and roads wider than 5.5 meters in width (nationwide),
- 2) The locations and the configurations of roads wider than 3.0 meters (in urban districts with a population exceeding 100,000),
- 3) Type of roads, route numbers, road-managerial officers, traffic congestion, cargo limits, etc.,
- 4) The locations and the names of bridges, viaducts (higher than 100 meters), tunnels, cave mouths, railroad crossings, footbridges, etc., and
- 5) The locations and the names of shorelines, rivers/basins, administrative boundaries, railroads, public facilities, recreational areas, bus terminals, parking lots, etc.

Other than the above, the association works to accumulate information necessary to manage public roads.

This database has been at the general public's disposal since 1989, providing private companies with information on, e.g., on-board car-navigation road maps. Concurrently, in order to enhance road management through the use of the digital road map database, the Ministry of Construction, the Tokyo metropolitan area and other prefectures, ordinance-designated cities, and public corporations jointly established The Research Institute on the Advancement of a Road-construction Plan and Management, executing the development of traffic-safety supporting system, and road-information supporting system coping with the case of abnormal weather.

(5) The Road Administration Information System (ROADIS) Database

Taking advantage of computer-mapping techniques, ROADIS is supposed to manage various information on public roads and objects related to public roads, and to supply this information to road-managerial officers and public-service companies. ROADIS is in charge of the development and operation of the system as well as setting up databases; the work is done in cooperation with road-managerial officers and other related people.

A base map scaled at a rate of 1/500 serves as the large-scale map for this database, and consists of road/topographical data extracted from the road directory map. The data of objects related to public roads, such as electric wires, telegraphic lines, gas pipes, water pipes, sewers, and underground railways are drawn on a base map in the shapes of lines and diagrams: e.g., pipelines, cables, and manholes have individual, distinct symbols. Furthermore, attributed data, such as the location of underground wiring and the material/caliber length of pipelines are also incorporated in the base map.

Today, this database has been completed for the Tokyo metropolitan wards and 10 other ordinance-designated cities. In these areas, the system was taken in operation between April 1990 and June 1991.

With more frequent utilization by road-managerial officers and other related people, the managerial control of public roads and objects related to public roads will be smoother, and road construction will become more efficient. This is expected to contribute to effective and proper road utilization in urban areas.

(6) Real Estate Information of the Designated Distribution Network

For the realization of smooth and prompt real estate transactions, a broader exchange of reliable real estate information is needed. For this purpose, the Ministry of Construction and the real estate industry have tied up and finally produced the Real Estate Information Network System (REINS).

REINS is standardized for end users that can, via terminals, register and retrieve necessary information on real estate transactions, such as prices, the time required from nearby railway stations, etc.

Designated by the Ministry of Construction, the organizations constituting the Designated Distribution Network exchange information between realtors that have adopted REINS. In May 1990, when this system came into effect, a total of 37 distribution systems were designated for the metropolitan areas of Tokyo, Nagoya, and Osaka, as well as for Hokkaido and other prefectures on a "one area, one system" basis.

The system host computers contain real estate information and object maps in the form of databases, which are registered by member realtors in compliance with the requests of owner proprietors. (Realtors signing intermediary contracts, such as the Exclusive Intermediary Contract, are assigned the task to register the conditions of the contract).

From the commencement of the system, the number of entries in the database has risen to approximately 715,000, as of late October 1991. The total number of registered stocks was 170,000, as of October 31, 1991.

In retrieving data, member realtors entrusted to handle a certain real estate transaction are thereby able to present conditions that satisfy client needs. When a business transaction is agreed upon, supplier realtors are supposed to input the contents of the contract into the system. For the period of April-October 1991 alone, as many as 35,000 contracts were reported.

Active utilization of the system is expected as follows.

- 1) Through information exchange among realtors nationwide, prompt and extensive real estate transactions based on precise information will accelerate, contributing to user convenience.
- 2) By using accumulated information on transactions such as contract reports, it will be easier to grasp market conditions, resulting in reasonable pricing.
- 3) Information exchange will focus competition on quality of service rather than quantity of information, which will improve the overall service quality of the real estate industry.

Appendix

- Appendix 1-1 Japanese Databases Accessible from Overseas (1992 : Producer)**
- Appendix 1-2 Japanese Databases Accessible from Overseas (1992 : Vendor)**
- Appendix 2 Japanese Databases Planned for Overseas Expansion**
- Appendix 3 Database Construction and Technical Development Promotion Project**

Appendix 1-1 Japanese Databases Accessible from Overseas (1992 : Producer)

Language: J : Japanese
E : English
O : Others

Media: O : Online
M : MT, FD
C : CD-ROM, CD-I

Company Name	Database	Description of Database	Language	Media	Main Countries
ADVANSIS, INC. (AVS)	ACSISS-E	Monthly data based on the daily online POS data of home-electric mass retail stores in Japan, provided in MT or printout	J	M	Germany
AGRISEARCH INC.	A QUARTERLY REPORT FOR AGRICULTURAL COOPERATION	Financial description of Agricultural Cooperation	J	M	U.S.A.
The Asahi Shimbun	AEN	Selected articles from Asahi Evening News	E	O/M	U.S.A., Europe, Asia
	ANS	Selected articles from Asahi Shimbun translated into English News	E	O/M	
Asia Data Research, Inc. (ADR)	ADR ASIAN PANEL REPORT	Retail panel data of home-electric appliances in Hong Kong, Singapore, Malaysia, Thailand, and Indonesia	J/E	M	Hong Kong, Singapore, Netherland
Chemical Data Service Incorporated (CDS)	CD-NET	A comprehensive database for chemical industry including news articles, chemical goods, corporate, and statistical information	J	O/M	U.S.A., U.K., Germany
	JCD-NET	A comprehensive database for chemical industry including news articles, chemical goods, corporate, and statistical information	J	O/M	
C. Industrial Research Institute	Computer Industry Index	Directory of 17,000 computer industry corporations in public, academic, and private sectors	J/E	M	
	Japan Software Company Directory	Description of 7,500 information processing and software development companies divided into 30 elements	J/E	M	
COMLINE International Corporation (COMLINE)	COMLINE Business Analysis	Analytical articles on Japan's technology development and industry trends since June, 1986. Update weekly	E	O/M/C	U.S.A., Europe
	COMLINE Industrial Monitor	News on Japan's industry, technology, and marketing strategies since June, 1986. Update daily	E	O/M/C	
	Tokyo Financial Wire	Financial, economic, and corporate news of Japan since June, 1986. Update daily	E	O/M/C	
Database Promotion Center, Japan (DPC)	ELECTRONIC VERSION OF THE DATABASE DIRECTORY	Descriptive information of 3,313 commercial databases accessible in Japan	J	M	
Dataquest Japan Limited	DQ MONDAY	Price and industrial trends for semiconductors	E	O	U.S.A., Europe
DENTSU INC.	ELNET	Collection of articles from 37 domestic newspapers and 120 journals. 600 thousand items are added monthly. Fulltext output is available through facsimile	J	O	U.S.A., and others
Dun & Bradstreet Business Information Services (Japan) K.K. (D & B)	DUNSPRINT	Credit information of Japanese companies including financial, historical and other descriptive data	E	O/M	Worldwide
Electronic Library Inc. (EL)	ELNET	Collection of articles from 37 domestic newspapers and 120 journals. 600 thousand items are added monthly. Fulltext output is available through facsimile	J	O	U.S.A., and others

Company Name	Database	Description of Database	Language	Media	Main Countries
GENEX Corp.	FITT	News and statistical data on Japanese and overseas forward bargain market	J/E	O	U.S.A.
Japan Association for International Chemical Information (JAICI)	CHEM-J	Bibliographic information of Japanese Chemical literature	E	O/M	Worldwide
	NQRS	Numerical data of Nuclear Quatropole Resonance Spectrum (NQRS)	E	O/M	
The Japan Information Center of Science and Technology (JICST)	JOIS				
	JICST File on Current Science and Technology Research in Japan	Research information files on research projects, planning and ongoing in Japan	J	O	U.S.A., U.K., Germany, Korea
	JICST File on Medical Science in Japan	Literature on Medical science in Japan (integrated with Japan Medical Abstracts by JAMAS)	J	O	
	JICST File on Science and Technology	Literature on science and technology, collected from scholarly journals, proceedings, technical notes and others in 50 countries	J	O	
	JICST File on Science, Technology and Medicine in Japan (in English)	English translations of articles on science, technology and medicine in JICST File on Science Technology, and JICST File on Medical Science in Japan	E	O	U.S.A., U.K., Europe and others
	JICST Holding list File	Information on JICST library resources	J	O	U.S.A., U.K., Germany, Korea
	STN				
	JICST-E	Comprehensive Japanese literature relating to science, technology and medicine	E	O	U.S.A., U.K., Europe and others
	JGRIP	Data on research being carried out at public-owned research institute in Japan	E	O	
	Japan Legislative Information Center	LEGALBASE	Full-text of all the judicial precedents	J	C
LEGALBASE		Abstracts of all the judicial precedents	J	C	
LEGALBASE		Full-text of judicial precedents in civil and commercial matters	J	C	
Japan Patent Information Organization (JAPIO)	Design	Bibliographic information of registered design in Japan	J	O	Korea, Taiwan, Germany, France, U.S.A. and others
	Japan Patent	Bibliographic information with some abstracts and drawings of published or public patents in Japan	J	O	
	Published Patent English Abstracts Data	Bibliographic information with abstracts of published patents in Japan	E	M	U.S.A., France
	Trademark	Bibliographic information with figures of published, public or applied trademarks in Japan	J	O	Korea, Taiwan, Germany, France, U.S.A. and others
	Utility Model	Bibliographic information with some abstracts and drawings of published or public utility models in Japan	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
Keizai Bunken Kenkyukai	JOINT (Journal of Industrial Titles)	Bibliographic information of magazine articles on economic	J	O	U.S.A., U.K., Singapore, and others
KK Kyodo News Service	JED	Contains cumulative news articles on Japanese economic data	E		U.S.A., Switzerland
	JLS	Realtime news-flash of Kyodo News Service	J	O	Worldwide
KMS, Inc.	KMS	Specialized database for advertising and marketing	J	C	Worldwide
KYODO News Service (KYODO)	K-WINES	Collection of articles from Kyodo News Service and its member newspaper companies	J	O	
Marketing Intelligence Corporation (MIC)	JOTI	Trends of overseas travelers	E	M	U.S.A., U.K.
	SDI	Sales trends information on over-the-counter medicine	E	M	
MEDIA RESEARCH CENTER INC.	MEDIX-JOURNALS	Electronic version of monthly "Media-Data", listing advertisement price of 3,000 Japanese popular journals	J	O/M	
	MEDIX-NEWS-PAPERS	Electronic version of monthly "Media-Data", listing advertisement price of 1,000 Japanese newspapers	J	M	
	ZASSHIMARC	Machine readable catalog of 20,000 periodicals published by 10,000 publishers except those of PR, house-organ, and examination	J	O/M	
METZ Ranching Systems Inc. (METZ)	Fishery Index	Bibliographic information of research reports on Japanese fisheries and oceanography	J	O/M	
National Diet Library (NDL)	JAPAN/MARC	Machine readable catalog of books and periodicals published in Japan	J	O/C	U.S.A., U.K., Canada
Nichigai Associates, Inc.	BOOK	Information on the contents of books published in Japan	J	O/M/C	
	MAGAZINE	Index of magazine articles published in Japan	J	O/M/C	
	PRIZE	Information on prize-winners and prize in Japan	J	O	
	WHO	Personal information extracted from newspapers, magazines, and books in Japan	J	O/M/C	
Nihon Keizai shimbun Inc. (NIKKEI)	China Economic Databank	Major statistical data from China	J/E	O	U.S.A., U.K., Germany, France, Switzerland, Italy, Canada, Hong Kong, Singapore, Korea
	Commodity Data	Price data and demand/supply data of major commodity market conditions	J/E	O	
	Consumer Rader	Originally obtained data on attitudes and reality of consumer behaviour toward financial issue	J	O	
	Consumer Statistics Data	Consumer price data from GAA	J/E	O	
	Corporate Profile	Outline of major companies	J/E	O/M/C	
	Corporate Action Related Data	Data on pattern of fund raising, increase and decrease of capital, and other bond issuing by listed companies	J/E	O/M	
	Daily Exchange Rate & Interest Rate Data	Daily data of foreign and domestic exchanges	J/E	O	
	Earning Estimate for Listed Companies	Estimated and actual data of balance of settlements of accounts for listed companies	J/E	O/M	

Company Name	Database	Description of Database	Language	Media	Main Countries
Nihon Keizai shimbun Inc. (NIKKEI)	Economic Data by Size	Economic statistical data of small-to-medium-sized companies	J/E	O	U.S.A., U.K., Germany, France, Switzerland, Italy, Canada, Hong Kong, Singapore, Korea
	Energy Data	Demands/supply data and cost data on petroleum, coal, electric, gas, and nuclear power	J/E	O/M	
	Financial Statement for Insurance Companies	Balance of settlements of accounts for non-life insurance companies submitted to MOF	J/E	O/M	
	Financial Statement for Banks	Balance of settlements of accounts for Banks	J/E	O/M	
	Financial Statement for Security Houses	Balance of settlements of accounts for security houses submitted to MOF	J/E	O/M	
	Financial Statement for Listed Companies	Balance of settle-settlements of accounts for listed companies	J/E	O/M	
	Flash Report for Listed Companies	Balance of settlements of accounts for listed companies as disclosed	J/E	O/M	
	Futures Data	Trading and price data of forward buying stock and bond	J/E	O/M	
	Industrial Data	Statistical data on various industries obtained from MITI and industrial associations	J/E	O	
	International Trade Statistics	International trade statistics by country from MOF	J/E	O	
	Major Market Indices Data	Stock price average data by Nikkei and of 500 major stocks	J/E	O	
	News Flash	Real-time news from all over the world categorized by subjects	J/E	O	
	Newspapers, Newsletters, and Magazines for Text Search	Articles from newspapers including four Nikkei publications and several magazines	J/E	O	
	Nikkei Energy Model	Quarterly metrical model for evaluation and forecast for demand/supply of energy sources	J/E	O	
	Nikkei Monetary Databank	Major financial data including money supply, interest rates and capital circulations	J/E	O/M	
	Nikkei Monetary Model	Short-term metrical model for market interest rates and public bonds	J/E	O	
	Nikkei Macro Model	Metrical model for quarter analysis intended to provide short-term forecast and structural analysis	J/E	O	
	Nikkei Macro Economics Statistics	Major national statistics of Japanese economy including statistics of earnings, life, business, and finance	J/E	O/M	
	Options Data	Trading and price data of options	J/E	O/M	
	Personnel Data Bank	Personnel data of executives of major companies and managing staff of government employees	J	O/M	
	POS Data	POS data on daily goods including food and household commodities collected from 150 stores	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
Nihon Keizai shimbun Inc. (NIKKEI)	Portfolio Related Data Service	Various indices on risks and returns in Japanese and US stock market investment with portfolio evaluation system	J/E	O	U.S.A., U.K., Germany, France, Switzerland, Italy, Canada, Hong Kong, Singapore, Korea
	Regional Databank	Regional data on area, population, land price, and establishments	J/E	O	
	Regional Economic and Financial File	Regional industrial, financial, consumer price, labour force, and commerce data	J/E	O	
	Regional Input Output Table	Input output tables within and between regions by MITI	J/E	O	
	Short-term Model for Seven Advanced Nations	Quarterly metrical model for Japan, US, UK, France, Germany, Italy and Canada intended to provide short-term forecasts	J/E	O	
	Statistics on Construction	Statistics on orders received, starting works, and other construction related activities	J/E	O	
	Statistics of Incorporated Enterprises	Statistics of incorporated enterprises from MOF	J/E	O/M	
	Statistics on Products, Shipments, and Inventory	Statistics on products, shipments, and inventory from MITI	J/E	O	
	Statistical Data Wholesale Consumer Price	Wholesale price indices, import price indices and input-output price indices by industry	J/E	O	
	Stock and Bond Data	Stock data of listed companies and over-the-counter trading in national stock market and bond data for Tokyo and Osaka Exchanges	J/E	O/M	
	Technical Indices for Industries and Each Issue	Basic indices and indicis by industry on Tokyo and Osaka Exchanges	J/E	O	
	Unlisted Companies Submitted their Marketing Report to MOF	Marketing report information submitted to MOF by unlisted companies	J/E	O/M	
	Unlisted Companies Submitted their Securities Report to MOF	Securities report information submitted to MOF by unlisted companies	J/E	O/M	
	World Economic Long-term Model	Annual metrical model for long-term forecasts of the world except communists' countries in which original simulation is available	J/E	O	
NIPPON SHUPPAN HANBAI INC. (NIPPAN)	NIPPAN MARC	Bibliographic information of 800,000 newly published book in Japan since 1976	J	M/C	China
NOMURA RESEARCH INSTITUTE Co., Ltd.	NRI/E	Numerical and textual data of Japanese economy, finance and industry	E	O/M	U.S.A.
Personal Business Assist Inc. (PBA)	PCOM-HOST	Descriptive information on auto-logon file and function key definition file of "PCOM" communication software	J	O	Korea
PRODECO	ELECTRONIC INDEX LIBRARY	Holding information of periodical	J		U.S.A.

Company Name	Database	Description of Database	Language	Media	Main Countries
QUICK Corp.	QUICK-FF	Realtime information on forward and option buying, easily selected, calculated or edited based on users' own investment strategies. Calculation of implied volatility, portfolio management, and automatic update of charts are available	J/E O: Numeric	O	Hong Kong
	QUICK Indicator Board	Realtime presentation of various economic indicators	O: Numeric	O	
	QUICK Video-1	Realtime information on stock, bond, and over-the-counter dealing prices, settlement of accounts, and financial information of listed companies on Japanese and overseas Stock Exchange Markets	J/E O: Numeric	O	Hong Kong, U.K., U.S.A., Switzerland, Bahrain, and others
	QUICK-VS	Common use online terminal for QUICK and other services	J/E O: Numeric	O	U.K., Germany, Switzerland, and others
	QUICK-10	Realtime information on global stock, finance, and money exchange, presented through special multi-screen display	J/E O: Numeric	O	Hong Kong, Singapore, Australia, and others
	QUICK-10E	European version of QUICK-10. Provided by QUICK EUROPE for Europe, America, and Middle-East	J/E O: Numeric	O	U.K., U.S.A., France, Germany, Switzerland, Bahrain, and others
Shikoku Research Institute Incorporated (SRI)	NEW MATERIALS DATABASE	Bibliographic information with abstract on the development and manufacturing of new materials including fine ceramic and highpolymers	J	M	
Jiji Press, Ltd.	JSD	Lists of prices for all issues on the TSE first section, Osaka first and second sections, and all issues on the NYSE and AMEX	E	O	U.S.A., and others
	MAIN	Comprehensive securities and financial information	J	O	Hong Kong, Singapore, U.K.
TEIKOKU DATABANK, LTD. (TDB)	CCR	Detailed research reports on financial trends of Japanese companies	J	O	U.S.A., Europe
	JAPANESE COMPANIES	Business information of 50,000 Japanese companies with English trade name	J/E	O	
TOYO KEIZAI INC.	BRIEF NOTE ON SETTLEMENT OF ACCOUNT	Financial data of all the listed and over-the-counter traded companies	E	O	Worldwide
	BRIEF NOTE ON SETTLEMENT OF CONSOLIDATED ACCOUNT	Financial data of consolidated account listed companies	E	O	
	BUSINESS FORECAST FILE	Financial forecasts data of all the listed and over-the-counter traded companies	E	O	
THE YOMIURI SHIMBUN	YOMIDAS	Collection of articles from Yomiuri Shimbun including regional versions	J	O	U.S.A., U.K.
	Yomiuri Report From Japan	Collection of domestic business news articles written in English	E	O	U.S.A., Europe

Appendix 1-2 Japanese Databases Accessible from Overseas (1992 : Vendor)

Language: J : Japanese
E : English
O : Others

Media: O : Online
M : MT, FD
C : CD-ROM, CD-I

Company Name	Database	Description of Database	Language	Media	Main Countries
COMLINE INTERNATIONAL CORPORATION (COMLINE)	Asahi Online Database	Collection of articles from Asahi Shimbun and Asahi Evening News since Dec., 1988. Updated daily	E	O	U.S.A., Europe
	BioWorld Online	Online version of bio-industrial newspaper published by IO Publishing in the USA since Sep., 1990. Updated daily	E	O	
	Mainichi Daily News	Collection of articles from Mainichi Daily News since July, 1988. Updated daily	E	O	
G-SEARCH Corporation	AERA Database	Collection of all articles from weekly magazine "AERA"	J	O	U.S.A., U.K., Hong Kong, Korea
	Asahi Shimbun Database	Collection of almost all articles from Asahi Shimbun	J	O	
	Asahi Shimbun Evening Online	News-flash of Asahi Shimbun Evening Version	J	O	
	Asia Newflash Service	News-flash of Asia Business Information	J	O	
	Atomic Code Information Database	Information on programs of atomic code used for calculation of data on nuclear reactor design, operation, and safety analysis	J	O	
	BOOK	Information on the contents of books published in Japan	J	O	
	BOOK/ MONTHLY..	Monthly revision of new informatio from "BOOK"	J	O	
	CD New Score Information	Information on newly published and forth-comming CD	J	O	
	Cfarbase	Detailed description of 8,000 major companies in 47 countries world-wide	J/E	O	
	Cross-File Retrieval of Company Database	Cross-file retrieval system for 8 company databases	J	O	
	Cross-File Retrieval of Newspapers	Cross-file retrieval system for "Asahi Shimbun", "Mainichi Shimbun", and "Yomiuri Shimbun"	J	O	
	Database Directory	Description of databases available in Japan	J	O	
	ECONOMIST	Electronic version of "Economist" journal, full-text	J	O	
	ELISNET	Technical data of semiconductors	J	O	
	FASHION INFORMATION	Information extracted from "Fashion Terminology Directory", "Fashion Annual" and "Department Store Business Information"	J	O	
	Industrial and Technical Information on China	Major articles related to industry and technology from Chinese newspapers	J	O	
	Industrial News	News-release from companies, governments and related organizations	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
G-SEARCH Corporation	Information Industry Hotline	Flash information of "The Daily Network News"	J	O	U.S.A., U.K., Hong Kong, Korea
	Information Newsboard on Asian Countries	Micro-business information of Asian countries	J	O	
	INTELLECT	Judicial precedent and related information on intellectual property lawsuits	J	O	
	JETRO ACE	Collection of reports and other materials from 80 overseas points of JETRO	J	O	
	JETRO-WINDS	Information for promotion of trade gathered by JETRO	J	O	
	JTB Hotel Information	Directory of domestic hotels and lodges	J	O	
	Kyodo News Linkage Database	Collection of articles from Kyodo News linkage newspapers	J	O	
	Laser-Disk Information	Laser-disk information published in "CD-Journal"	J	O	
	MAGAZINE	Articles from 1,300 magazines published in Japan	J	O	
	Mainichi Shimbun Database	Collection of major articles from the Mainichi Shimbun	J	O	
	Major Economic Indices	Numerical data on national income, consumer price and other indicators	J	O	
	MANAGEMENT	Online version of the encyclopedia of management business "Gendai Business Taikai"	J	O	
	Manual of Company Events and Festivals	Instructional manual on how to proceed company events and festivals	J	O	
	Market Search	Reference to the marketing research into all industries in Japan	J	O	
	Medical and Pharmaceutical Database	Pharmaceutical information from attached documents and urgent news	J	O	
	Music CD Catalog	Bibliographic and price information with critics for music CD	J	O	
	NEW BUSINESS INDUSTRY REPORT	Research reports of remarkable industries' trends and issues including description, structure, and profitability information	J	O	
	NEW MEDICINE	Development information of new medicine	J	O	
	Nikkan Kogyo Shimbun Database	Collection of articles on new products and technology from Nikkan Kogyo Shimbun	J	O	
	NIKKAN SPORTS	Collection of articles from "Nikkan Sports" newspaper	J	O	
	NIKKAN YAKUGYO DATABASE	Collection of articles from "Nikkan Yakugyo" medical newspaper	J	O	
	PRIZE	Information on prize-winners and prizes in Japan	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
G-SEARCH Corporation	Securities Reports	Electronic version of "Yukashoken Hokokusho Soran (Securities reports)" published by Printing Bureau of the Ministry of Finance, covers financial data and business description of listed companies	J	O	U.S.A., U.K., Hong Kong, Korea
	SEIKATSU-SHA Questionnaire Library	Summerised version of "SEIKATSU-SHA DATA" published by JMA	J	O	
	Techno-Search	Abstracts of articles on new products and new business development from five newspapers	J	O	
	Teikoku Databank Company Information	Summarized data on 900,000 firms in Japan	J	O	
	Teikoku Databank Company Financial Information	Financial data on 250,000 firms in Japan	J	O	
	TEIKOKU DATABANK: JAPANESE COMPANIES	Business information of 50,000 Japanese companies with English trade name	E	O	
	Title Information of Weekly and Monthly Journals	Title information of 32 popular journals	J	O	
	Title Search	Table of contents of industrial and technological magazines issued in Japan	J	O	
	TKC Legal Information (LEX/DB)	Judicial precedent and related information on civil cases and administrative laws	J	O	
	Toyo Keizai Company Information	Detailed information on Japanese listed companies and foreign owned companies	J	O	
	TSR CEO Information	Personal history and contact information of 500,000 Japanese company CEOs	J	O	
	TSR Company Information	Summarized data on 500,000 Japanese companies	J	O	
	TSR Company Financial Information	Financial data on 65,000 Japanese companies	J	O	
	Video & CD Flash	Domestic on-sale information of video and CD	J	O	
	WHO	Personal information on those extracted from newspapers, magazines, and books published in Japan	J	O	
	Yomiuri Shimbun Database	Collection of almost all the articles from Yomiuri Shimbun and Yomiuri Katei Shimbun	J	O	
The Industrial Bank of Japan, Limited (IBJ)	KOGIN Financial Data/Consolidated	Information on final settlement of consolidated accounts for listed and unlisted companies	J	M	U.S.A., Europe
	KOGIN Financial Data/Debt of Financial Industry by Company	Information on debt of each financial company based on specific debt statement	J	M	
	KOGIN Financial Data/Final Settlement I	Information on final settlement of account for listed companies except financial and insurance industry	J	M	

Company Name	Database	Description of Database	Language	Media	Main Countries
The Industrial Bank of Japan, Limited (IBJ)	KOGIN Financial Data/Final Settlement II	Information on final settlement of account for selected unlisted companies	J	M	U.S.A., Europe
	KOGIN Financial Data/Interim Settlement	Information on interim settlement of account for listed companies except financial and insurance industry	J	M	
Japan Association for International Chemical Information (JAICI)	QCLDB	Literature on quantum chemistry published by major international journals	E	M	Worldwide
The Japan Information Center of Science and Technology (JICST)	JOIS				
	Nikkan Kogyo File on New Technology and Products in Japan	Database of the Nikkan Kogyo Shimbun (industrial newspaper)	J	O	U.S.A., U.K., Germany, Korea
	STN				
	CABA	Worldwide database of agricultural and related literature, after 1973	E	O	U.S.A., Europe, U.K. and others
	EMBASE	Bibliographic information of life science, medicine and pharmaceuticals produced by Excerpta Medica	E	O	
	FSTA	Bibliographic database containing the literature in food science and food industry in general	E	O	
	MEDLINE	Worldwide database of medical literature, produced National Library of Medicine	E	O	
Japan Patent Information Organization (JAPIO)	INPADOC	Bibliographic information of patents published by 53 countries	E/O	O	Korea, Taiwan, France, Germany, U.S.A. and others
The Japan Research Institute, Ltd.	I-QUEST	Information on books, newspaper articles, companies and NHK news texts	J	O	U.S.A., U.K., and others
Japan Weather Association (JWA)	Maritime Weather Report	Weather reports on the North Pacific Region	O: Numeric	M	U.K., China
	Weather Satellite Data	Analyzed data from the NOAA and Himawari weather satellites	O: Numeric	M	U.K., U.S.A., China
	Weather Satellite Imagery	Image data from the NOAA and Himawari weather satellites	O: Numeric	M	
MARUZEN CO., LTD.	J-BISC Others	CD-ROM version of "JAPAN/MARC", database of catalogs on books published in Japan	J	C	U.S.A., U.K., France, Canada and Others
NIFTY Corporation	AERA Database	Collection of all articles from weekly magazine "AERA"	J	O	
	Aged Care Information	Topics and news on aging with corresponding public policy information	J	O	
	Apple & Macintosh	Information on Apple and Macintosh	J	O	
	Asahi Evening News	Articles from Asahi Evening News	E	O	
	Asahi News Service	English version of articles from Asahi Shimbun	E	O	
	ASAHI ONLINE DATABASE	English news from "Asahi Evening News" and others	E	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	Asahi Shimbun Database	Collection of almost all articles from Asahi Shimbun	J	O	
	Asahi Shimbun Newflash	Newflash from Asahi Shimbun	J	O	
	Asian Business Information	Micro-business information of ASEAN and NIES Countries	J	O	
	Asia News flash	Business information on NIES, ASEAN countries and China	J	O	
	BioWorld Online	Information on Biotechnology	J	O	
	Book/Monthly	Monthly revision of new information from "BOOK"	J	O	
	Books on PC	Review of books related personal computers	J	O	
	Book Street	Information on new books, best-sellers and lectures	J	O	
	Business Analysis	Articles on Japanese economy and industry	E	O	
	Business and Market Trends	Information on macro economic trends	J	O	
	Business Information Guide	Directory of business related organizations	J	O	
	Business Letter Examples	Collection of business letter examples	J	O	
	CD New Score information	Information on newly published and forth-coming CD	J	O	
	Cfarbase	Financial information of 8,000 major international companies	J	O	
	Cfarbase	Financial information of 8,000 major international companies	E	O	
	Chunichi Shimbun Chubu Local News	Summary of local news articles from Chunichi Shimbun	J	O	
	Chunichi Shimbun Headline News	Summary of news flash from Chunichi Shimbun	J	O	
	Chunichi Shimbun News Summary	Summary of selected articles from Chunichi Shimbun morning edition	J	O	
	Chunichi Shimbun TokaiHokuriku Financial Information	Financial information of 9 prefectures in TokaiHokuriku region	J	O	
	COSMOS2	Financial and descriptive data on Japanese companies from Teikoku Databank	J	O	
	Current Index for Journals	Current articles of journals categorized into various fields	J	O	
	Current Index of PC Journals	Summary of articles from major PC journals	J	O	
	Dataquest Industry Analysis of Information Systems	Trends and analytical information of Information Systems industry	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	Dial Q2 Program Reference	Description of programs offered from Dial Q2	J	O	
	Economic Policy Information of Government	Information on reports from government agencies, Nihon Ginko, and others	J	O	
	ECONOMIST	Electronic version of "Economist" journal published by Mainichi Shimbun	J	O	
	"Economist" Database	Retrospective collection of articles from "Economist"	J	O	
	Educational News from Mainichi Shimbun	Articles on education, entrance examinations from Mainichi Shimbun	J	O	
	ELISNET Semi Conductor Information	Technical information of semiconductor parts	J	O	
	English Business Letter Examples	Collection of examples of business letters in English	E	O	
	English Letters for Technical Fields	Collection of examples of English sentences for technical use	E	O	
	English NewsRelease	Collection of newsrelease in English	E	O	
	Entertainment Programs of Department Stores	Information on entertainment programs held at department stores in Tokyo Metropolitan Area	J	O	
	FAIRS AND EVENTS	News flash on fairs and events held in Japan	J	O	
	Financial and Economic News from Kyodo	Financial and economic news from Kyodo, AP, and Dow Jones	J	O	
	Finding Books	New book information	J	O	
	Fishing Information from Kansai	Fishing information of western Japan from weekly "Tsuru Sunday"	J	O	
	Flower Market Information	Price information of flowers at Tokyo Ohta Flower Market	J	O	
	FM & OASYS SERIES	Information and training course guide for OASYS and FM-series of Fujitsu	J	O	
	Guide for Golf Membership Market	Information on golf membership prices	J	O	
	Guide to Excellent Eating Places in Tokyo	Electronic version of "Tokyo Excellent Eating Places '91-'92"	J	O	
	Guide to HighTech Training Courses	Information on training courses held by "Kodo Gijutsu Kaihatsu Center"	J	O	
	Guide to the Fuji-TV Programs	Description of programs broadcasted through Fuji-TV	J	O	
	Guide to the Satellite Movie Programs	Description of movies broadcasted through communications satellites	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	Hit Products Information	Remarkable and well sold commodity information	J	O	
	Hokuriku Honobono Information	Sightseeing guide of Hokuriku Region	J	O	
	Horse Race Tip	Numerized data of horse race forecasts	J	O	
	Hot 100 from Yomiuri Shimbun	Newsflash from Yomiuri Shimbun	J	O	
	Industrial News	Newsrelease from companies, governments and related organizations	J	O	
	Industrial Monitor	News-monitoring service on Japanese industrial technological information	E	O	
	Information for Obtaining Driver's License	Information on how to obtain driver license	J	O	
	Information for Obtaining Motor Bicycle License	Information on how to obtain motor bicycle license	J	O	
	Information of Weekly and Monthly Journals	Title information of major popular journals	J	O	
	I-N Industrial Statistics	Production, shipment/stock data and trade information for 39 industries	J	O	
	JAPAN MARC	Catalog of books published in Japan	J	O	
	JETRO ACE	Collection of reports and other materials from 80 overseas points of JETRO	J	O	
	JETRO-WINDS	Information for promotion of Japanese imports including trade fairs and afterservice of imported goods	J	O	
	Jiji Press News Flash	News flash from Jiji Press	J	O	
	Kyodo Financial News Flash	News flash on financial information	J	O	
	Kyodo Flash News Database	Online newsflash	J	O	
	Kyodo News Financial and Economic Flash News	News flash from Kyodo News Service	J	O	
	Kyodo Newsflash	Newsflash from Kyodo News Service	J	O	
	Kyodo News Linkage Database	Collection of articles from Kyodo News linkage newspapers	J	O	
	Lasar Disk Information	Domestic on-sale information of laser disks	J	O	
	MAINICHI DAILY NEWS	English newsflash of Mainichi Shimbun	E	O	
	MAINICHI ONLINE DATABASE	Collection of articles from Mainichi Daily News	E	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	Mainichi Shimbun Company News Release	News release from Japanese companies and institutions	J	O	
	Mainichi Shimbun Composition Seminar	Information on pros and cons of writing expression	J	O	
	Mainichi Shimbun Database	Collection of major articles from the Mainichi Shimbun	J	O	
	Mainichi Shimbun Headline News	Summary of articles from Mainichi Shimbun	J	O	
	Mainichi Shimbun Kansai News	Collection of articles from Mainichi Shimbun Kansai version	J	O	
	Mainichi Shimbun Lottery Information	Referral of winning number of lottery and others	J	O	
	Mainichi Shimbun Newsflash	Newsflash from Mainichi Shimbun	J	O	
	Mainichi Shimbun Photographic Database	News photograph database	J	O	
	Mainichi Shimbun Regional News	Real-time regional news from Mainichi Shimbun	J	O	
	Market Search	Reference to the market research report issued by public and private institutions	J	O	
	Mew Business Hi-Tech Information	Technological and products information of Japanese hightechnology industries	J	O	
	Music CD Catalog	Bibliographic and price information with critics for music CD	J	O	
	Network News	Online flash of "The Daily Network News" new PC products	J	O	
	New Business Industry Report	Research Reports of 350 remarkable industries business terms and analysis	J	O	
	NHK News Flash	Broadcasted news texts from NHK	J	O	
	NHK News Texts	Broadcasted news texts by NHK	J	O	
	NICHIGAI ASSIST	WHO BOOK MAGAZINE Management	J	O	
	Nihon Nogyo Shimbun Articles	Collection of agricultural articles from "Nihon Nogyo Shimbun"	J	O	
	Nikkai Shimbun Articles	Collection of articles from Nihon Keizai Shimbun	J	O	
	Nikkan Kogyo Shimbun Database	Collection of articles from Nikkan Kogyo Shimbun	J	O	
	Nikkan Sports Newspaper Information	Collection of articles from Nikkan Sports Newspaper	J	O	
	NIPPAN MARC	Catalog of books published in Japan	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	Ongaku Shuppan Concert Information	Guide to western and Japanese music concerts held in Japan	J	O	
	Online Stock Price Newslash	Stock price news from first and second section of TSE	J	O	
	Overseas Event Convention Information	Information on events, conventions and exhibitions overseas	J	O	
	PC Hardware Database	Description and price information of PC hardware products	J	O	
	PC New Products	Description and price information of new PC products	J	O	
	Per-Golf Information	Results of tournaments and new products on golf	E	O	
	PIA Comming Soon	Information on newly published CD	J	O	
	PIA Road Shaw Information	Updated road show guide	J	O	
	PIA Ticket Guide	Purchasing guide for tickets	J	O	
	Precious Metals Market	Information on precious metal prices	J	O	
	Pro-baseball Game News	Daily game news of pro-baseball	J	O	
	Reference on Research Reports	Summary of research reports from public and private research institutions	J	O	
	Reports from Mitsubishi Research Institutes	Forecasts for 90's of various fields based on case studies	J	O	
	Safety Information for Passengers Abroad	Safety information for Japanese passengers abroad	J	O	
	Sanwa Soken Financial and Economic Information	Information of foreign money exchange market and economic news	J	O	
	Securities Reports	Contents information of "Securities Reports"	J	O	
	Security Information	Information on stock quotations	J	O	
	Sight-seeing Information	Information on festivals, events, sight-seeing spots, and accommodations	J	O	
	Star System Video List	Major video movies casted by popular foreign actors and actresses	J	O	
	SUPONICHI Entertainment Information	Entertainment and slow business information	J	O	
	SUPONICHI Sumo Information	News flash on victory or defeat of Sumo matches	J	O	
	TDN Horse Race Guide	Guiding information for horse races by JRA	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	TEIKOKU DATABANK FINANCIAL INFORMATION	Financial information of 250,000 Japanese major companies	J	O	
	The Teleputing Hotline	News related to telecommunication and information in English	E	O	
	This Week's Stocks to be Watched	Information on remarkable stocks selected by editors of investment magazines	J	O	
	Title Information of Weekly and Monthly Journals	Title information of 32 popular journals	J	O	
	Title Search	Table of contents of industrial and technological magazines issued in Japan	J	O	
	TKC Legal Information	Judicial precedent and related information on civil cases and administrative cases	J	O	
	Toku-Toku Information	Information on benefits, premiums, and gifts offered from various media	J	O	
	Tokyo Financial Wire	Financial, economic, and company information of Japan	E	O	
	Tokyo Journal Information	Collection of articles from "Tokyo Journal"	E	O	
	Tokyo Survival Guide	Guidance information on Tokyo in English	E	O	
	Topics of PC Journals	Bibliographic information of articles of major PC journals	J	O	
	Top of Morning Newspapers	Newsflash of top articles from national newspapers	J	O	
	Toyo Keizai Company Information	Detailed information on Japanese listed companies and foreign owned companies	J	O	
	Travel and Taste	Profiles and special information on Hokuriku Region	J	O	
	TRS Financial Information	Financial information of 50,000 Japanese major companies	J	O	
	TSR Company Information	Summarized data on 500,000 Japanese Companies	J	O	
	Tsukiji Fish Market Price Information	Fresh fish wholesale price information from Tsukiji Fish Market	J	O	
	TV and Movie Daily Guide	Ratings of TV programs and movies	J	O	
	Updated Fishing Information	Information on techniques and points of fishing	J	O	
	Urban Development Information	Urban development and planning information	J	O	
	USIA Wireless File	Reports from US government agencies	E	O	
	VIDEO & LD Flash	Domestic on-sale information of Videos, LDs and CDVs	J	O	

Company Name	Database	Description of Database	Language	Media	Main Countries
NIFTY Corporation	World Report	Information extracted from "Trade-Pia" world reports	J	O	
	Yamagata Regional Information	Sightseeing guide of Yamagata	J	O	
	The Yomiuri News Service	News flash in English language from Yomiuri Shimbun	J	O	
	Yomiuri Shimbun Database	Collection of almost all articles from the Yomiuri Shimbun and the Yomiuri Katei Shimbun	J	O	
	Yomiuri Shimbun Newsflash	Newsflash from Yomiuri Shimbun	J	O	
Nihon Keizai Shimbun, Inc. (NIKKEI)	Asian Corporate Profile	Description of companies in Asia including 12,000 Chinese manufacturers, 1,800 Korean listed companies and 600 listed companies of other countries	E	O/M	U.S.A., U.K., Germany, France, Switzerland, Italy, Canada, Hong Kong, Singapore, Korea
	CITIBASE	Major economic statistics and indices for United States	E	O	
	Data on Borrowing by Financial Institutions	Data on borrowing by provided by Industrial Bank of Japan	J/E	O/M	
	IFS Data	Financial statistics and price indices with GNP for IMF member countries	E	O	
	Input Output Table	Input-output tables originally developed by Nikkei based on public statistics	J/E	O	
	OECD Economic File	Major economic indices including GNP, production, employment, consumer price and international exchange for 25 major nations	E	O	
	OECD National Income Statistics File	National expenditure and its itemized break-down for 13 industrial nations	E	O	
	World Bank External Dept Statistics File	Balance of depts and other economic indices of 105 developing countries	E	O	
Research Institute of International Trade and Industry	Input-Output Table	Input-Output Table from MITI	O: Numeric	M	U.S.A.

Appendix 2 Japanese Databases Planned for Overseas Expansion

Subject: ① Science and Technology
② Economics, Business and Finance
③ General or Others

Language: J: Japanese
E: English
O: Others

Media: O: Online
M: MT, FD

Database Name	Description of Database	Subject	Language	Media
Atomic Bomb Documents	Collection of articles and documents on atomic bomb since the atomization of Hiroshima.	③	J, E	O, C
BRANDY	Retrieval system for similar trademarks.	②	J	O
C & C-VAN Database Service	Business information including company information of TEIKOKU DATABANK and TSR as well as collection of articles from Asahi Shimbun.	②, ③	J	O
COMLINE Corporate Directory	Directory of 5,000 Japanese listed companies and chemical and biological companies. Covers corporate profile and titles of related newspaper articles. U.S. SIC code will be used.	②	E	O, M, C
COMLINE Fundamental Data	English version of "Yukashoken Hokokusho (Security Reports)" published by Printing Bureau of the Ministry of Finance.	②	E	O, M, C
THE DAILY YOMIURI DATA BASE	Collection of articles from "The Daily Yomiuri".	③	E	O
Directory of computer Industry	Directory of 17,000 computer industry corporations in public, academic, and private sectors.	②	J, E	M
Directory of Information Processing and Software Industry	Directory of 7,500 information processing and software development companies, divided into 30 elements.	②	J, E	M
Electronic Atlas of Anatomy	Comprehensive anatomic atlas of human body with visual images offered in CD-ROM.	③	J, E, O: Latin	C
IN Economic Statistics	Statistical time series of economic data.	②	E	O
Japanese Books in Print	Information of Japanese publications.	②	O: Korean	C
JAPANESE COMPANIES	Directory of 220,000 Japanese companies.	②	J, E	O
JETOC/KASHIN	List of 23,000 existing chemical compounds	②	J, E (part)	O
JPNADVTDATA	Selected version of MEDIX.		E	O, M
KMC:Kitasato Microbial Chemistry Database	Database of physiological activation materials extracted from microorganisms.	①	E	M
PHARMCAST	Information on domestic and overseas test drugs.	①	E	O
PROTON-NMR Spectol Database	NMR spectrum data for 10,000 organic compounds.	①	E	M
Publicized Patents Abstracts in English	Abstracts of publicized patents since October, 1976 in English	①	E	M
SCI	Database of domestic consumer household panel research.	②	E	O, M
SERIALMARC	Selected version of ZASSHIMARC.		E	O, M
(undecided)	Financial data with names of stock holders and executives for listed companies offered in CD-ROM.	②	E	C

Appendix 3 Database Construction and Technical Development Promotion Project

DPC financially supports some private companies and industrial organizations for the production of database and technical development.

DPC has provided this aid for two main purposes since 1984. The one is to promote the production of databases which is socially, economically and internationally, important or essential for the promotion of regional development and local industries. The other is to activate research and development of the database related technologies, which aims at increase

of the efficiency of production, distribution and utilization for databases. Consigned project has been performed for 5 subjects in 1984, 18 subjects in 1985, 24 subjects in 1986, 29 subjects in 1987, 24 subjects in 1988, 20 subjects in 1989, 23 subjects in 1990, and 21 subjects in 1991. The number of subjects covering various fields from 1984 to 1991 has reached 164. Subjects produced for 1991 are summarized as follows:

Subjects Contracted for Database Production and Technical Development for 1991

FIELD: Society

TITLE	Creation of prototype system for pathological database including morphological comments
CONSIGNED COMPANY	S.P.O. Ltd.
CONTENTS	<p>Various data accumulated in the process of diagnosis and treatments need to be utilized effectively as basic materials for providing better diagnosis and treatments as well as preventing diseases.</p> <p>In the current pathological information system, final outcomes of data processing such as pathological diagnosis are being merely treated as raw materials, and a pathological database system is merely used for performing data retrieval and totalization concerning pathological diagnosis.</p> <p>In order to utilize pathological data effectively, standardization of pathological diagnosis and pathological terms is necessary. Actually, however, the pathological data is not accordingly utilized because their majority is language information describing morphology.</p> <p>In 1990, the consigned company created a sample program after statistically investigating the 'relation between pathological diagnosis and morphological views' as well as 'mutual relation among views in the set of morphological views,' designing the concept of the models making morphological terms significant, and furthermore, performing surveys required for the creation of a database which embodies the aforementioned models, including 'Feasibility study of applying UNIX and RDBMS'.</p>

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CONTENTS	<p>In 1991, the company performed the following activities based upon its successful results of 1990:</p> <ol style="list-style-type: none">(1) Random sampling of 1,077 cases from data of actual views concerning pathological diagnosis(2) Creation of the prototype of database system(3) Trial of the system standardizing pathological information(4) Investigation of the models
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TITLE	Development of the Prototype for Traffic Accident Investigation Database
CONSIGNED COMPANY	Japan Automobile Research Institute, Inc.
CONTENTS	<p>A multifacet analysis of the causes of accident occurrences and injuries is one of the effective measures for decreasing the number of traffic accidents and casualties. For the purpose of establishing a Traffic Accident Investigation Database required for the analysis of the causes of accident occurrences and injuries, the Institute developed a prototype of the aforementioned database such as Results of Traffic Accident Investigation which the Institute is currently involved in.</p> <p>Traffic Accident Investigation Data dealt with for the purpose of the aforementioned tasks, are so minute that the maximum number of items under investigation exceed 500 per accident. For the purpose of more effective utilization of such minute data, user interface was improved so that retrieval of statistical data could be easily facilitated and analyzed.</p> <p>A prototype of the software, which enables easy reference of the data under investigation was developed through display on the monitor.</p> <p>Details are as follows:</p> <ol style="list-style-type: none">(1) Database design and prototype development(2) Development of the prototype for input forms(3) Development of the prototype of the software for retrieval of statistical data(4) Development of the prototype for output forms(5) Various examinations through the use of prototypes

TITLE	Database construction concerning the information on medical treatment and welfare of aged persons for the practical use
CONSIGNED COMPANY	Misaki Welfare Friendly Society for Aged People / Misaki Life House
CONTENTS	<p>An increase in the population of aged people gives rise to various social problems. Especially in Japan, where problems tend to remain unsolved, quick response to such problems is expected. One of the things that need to be done is to create a database containing information mainly on medical treatments and welfare required for the lives of aged people.</p> <p>This year, in the same way as the previous year, a database mainly concerning medical treatments and welfare based on the data obtained from the aged people participating in Misaki Welfare Friendly Society and Misaki Life House was created, and thereafter, the database was improved so that retrieval by personal computer could be done. This database is sufficiently available in other places.</p> <p>In addition, Case Conference System was introduced, with which experts on medical treatments and welfare analyze each of the data, using the database for decision making, and if necessary, taking measures thereby. As a result, the significance of such data collection has become clear, and such data have proved to be available. Furthermore, data produced in the process of Case Conference were input as data.</p> <p>Moreover, Misaki Net, in which people communicate by means of personal computers, was established for enabling to input data from the outside of Misaki Life House as well as creating a life information database containing information on hobbies, traveling, societies, etc. required for the life of aged people.</p>

TITLE	Construction of weather information database
CONSIGNED COMPANY	MTS Institute Inc.
CONTENTS	<p>The meteorological data have a great variety in type as well as in volume.</p> <p>In 1988, of this voluminous meteorological data we collected and processed the observed raw data and constructed the database in order to rapidly reply to the requests from clients.</p> <p>Also in 1989, the database was renewed after processing for higher level of information corresponding to wider requirements from the clients. The expansion of the application softwares</p>

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CONTENTS	<p>and the improvement of the user interface are also made. To arrange the historical data of numerous observation points, we separately created the point information database to support data retrieval.</p> <p>As a fruit of the above-mentioned efforts, we are now receiving many offers of meteorological and climate information as well as requests of data retrievals and collections from various quarters up to the date.</p> <p>Nowadays, the earth environment is becoming a main issue and various analytical works are being conducted. Under these circumstances, more sophisticated use of database is expected for the comparison of the past and present conditions. Therefore, this year we conducted the basic studies necessary for adding the real-time meteorological information to the database. The main items of this year were as follows:</p> <ol style="list-style-type: none"> (1) Survey on domestic and overseas real-time meteorological information (2) Investigation of the practical methods on receiving the real-time meteorological observation data (3) Survey on interface of data receiving system (4) Study on editing and processing of the received data (5) Study for constructing the joint database of both real-time and past data
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TITLE	Investigation and research for constructing a database system concerning underground water
CONSIGNEE COMPANY	PASCO Corporation
CONTENTS	<p>There are only a small number of databases including those being created concerning the quantity, quality, and behavior of underground water. However, in order to solve problems such as land subsidence or underground water pollution, to prevent underground construction work at a great depth from badly affecting underground water, to prevent accidents due to subsidence, and to predict underground water pollution due to poisonous waste matters, constructing a database containing the aforementioned information is expected.</p> <p>In this research, the necessity of preserving underground water as common property and how it is share were considered. Especially, from the viewpoint of the value of underground water having been unvalued up to now, information on</p>

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CONTENTS	<p>underground water to be contained in a database as well as such a database was examined.</p> <p>In the first place, a source of information from which information obtained as well as a collection system was considered, and also problems on data collection were solved. Moreover, as a desirable database system in the future, a relational database supporting SQL Language which may be operated easily by anyone was discussed.</p>
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TITLE	Development of literature database system about Fuzzy
CONSIGNED COMPANY	Japan Information Processing Development Center
CONTENTS	<p>Currently, Literature about Fuzzy theory is increasing rapidly in many fields. It is necessary to build literature database concerning Fuzzy theory and its applications. Because it could help to advance this subject or to keep the lead of Japan. Epecially, this database must be valuable information source for researchers engage in theoretical study, engineers apply this theory to the product development and many other people want to make use of industrial, social activities. Details of matters considered are as follows:</p> <p>To develop the system that would store, modify and retrieve data or their side data as thesaurus. To store approximately 450 data in the periodicals published by Japan Society for Fuzzy Theory and Systems as primary data. To investigate structure and method of employing this system.</p>

TITLE	Investigation and research concerning database utilization training system in colleges and universities in Japan
CONSIGNED COMPANY	Nichigai Associates Inc.
CONTENTS	<p>Database services in Japan, which were originated in the middle of Showa 40's (around 1970), are presently being provided through not only on-line systems but also other various media such as CD-ROM or electronic books.</p>

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CONTENTS	<p>In such circumstances, it is considered indispensable to foster information literacy (ability to utilize information) in the future mainly by utilizing databases in a more advanced way than computer literacy utilization, and educational institutions such as colleges and universities tend to assume a positive attitude to such utilization. However, trial and error are still being repeated in relation to such utilization, therefore, an investigation was performed for the purpose of grasping the nationwide actual condition of database utilization training as well as considering the way such training should be accomplished.</p> <p>First, questionnaires were sent to the following places or persons at each of the 1,092 national, prefectural, municipal, or private colleges, universities, or junior colleges in Japan: 1) the school authorities, 2) teachers in charge, 3) libraries. Moreover, not only hearing investigation was conducted on some of the aforementioned places or persons but also overseas literature (mainly U.S.) concerning the same problem was referred to.</p> <p>This database contains suggestions regarding colleges and universities as they ought to be, which were made on the basis of the results of such investigation.</p>
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TITLE	Development of multimedia database for social studies
CONSIGNEE COMPANY	Shingakusha Co., Ltd.
CONTENTS	<p>The company constructed a picture database for social studies and improved human interface of the retrieval software so as to create the prototype of a teaching aid dealing with history, with which data equaling or excelling those provided by a wall chart, lantern slide, OHP, and collection of materials having been used so far in elementary and junior high schools can be retrieved without any difficulty.</p> <p>This teaching aid may be used roughly in two ways: 1) the utilization by a teacher for the whole class, and 2) the utilization by pupils or students for the purpose of solving problems through research study.</p> <p>(1) When a teacher plans his lesson, he is required to scrutinize the materials he intends to provide so that such materials reflect his intention. By the use of Appreciation Mode (Play), pictures develop consecutively along the courseware already set. Therefore, teaching or learning by the use of pictures selected and arranged in line with the</p>

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CONTENTS	<p>intention of the teacher or the courseware maker becomes possible.</p> <p>(2) A pupil or a student can raise his ability to learn independently by utilizing various materials in order to solve problems assigned or he is aware of by himself. In this case, database containing materials which satisfy the following may be available:</p> <ol style="list-style-type: none"> 1) Data search shall be conducted easily. 2) The database shall be easily operated. <p>By using the Search Mode (Browse), pupils, students, or learners can learn voluntarily, choosing freely what they desire to know or see.</p> <p>Transfer between Appreciation Mode and Search Mode in both directions is possible at any time. Also, search is possible at any time, and the following item lists of Pullout Menu makes searching easier: era, person, events, politics, economy, diplomacy, culture, life, words and phrases, etc.</p> <p>As any relation between each pictorial datum is linked, other datum linked to a certain datum may be searched intuitively by use of the aforementioned item lists. By using the Position Confirmation Button, with which the class a datum belongs to can be easily confirmed, users do not stray into an offshoot but search and learn smoothly.</p>
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FIELD: Regional activation/promotion of small and medium companies

TITLE	Investigation of feasibility of building up the intelligent orientation database system for study in various fields
CONSIGNEE COMPANY	KEIHANNA INTERACTION PLAZA INC.
CONTENTS	<p>The rapid growth of industrial technology has increased the need for enterprises to move into various new fields. Because of this, more and more people are forced to learn or study in new fields.</p> <p>Therefore, it is meaningful to build up a database of knowledge and information of any kind for study in various fields, and, based on it, to build up the intelligent orientation system utilizing the intellectual engineering technique which is capable of providing appropriate orientation and guidance. This will improve learning efficiency, and consequently make the best use of talent, promote the reshuffle efficiency, and be useful for industrial advancement and business activities.</p>

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CONTENTS	Concerning this subject, a research study was carried out on the feasibility of building up the intelligent orientation database system as mentioned above to reveal its possibility, usefulness and marketability.
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TITLE	Creation of database containing materials concerning local history prepared by public libraries in Setouchi Region
CONSIGNEE COMPANY	Chugoku Shimbun, Ltd.
CONTENTS	<p>Many of the materials concerning local material, which belong to a library, are precious and cannot be replaced because they are prepared only in the library. Therefore, each library is fully prepared for perusal in a special way. For instance, 'Local Material Corner' is established for users' convenience.</p> <p>However, many of the materials concerning local material including nominal publications such as private theses written by volunteers and university bulletins are minor publications, to which ISBN (International Standard Book Number) is not assigned.</p> <p>Naturally, such materials cannot be contained in book databases such as JAPAN-MARC and TRC-MARC. Computerization is prevailing lately in each library, but inter-library search is, for the time being, impossible because no network connecting libraries has been established.</p> <p>The aforementioned database will eliminate the inconvenience libraries are confronted with, and provide convenience to colleges, universities, and other research institutions in the region. Moreover, it will greatly contribute to library computerization successively in progress, such as standardization of the format of bibliographical items.</p>

TITLE	Creation of pilot system required for article database access
CONSIGNEE COMPANY	The Kahoku Shimpō
CONTENTS	It is expected that a region independently creates a database and sends it to other regions in order to provide the region with more information. The Kahoku Shimpō, which is entrusted with

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CONTENTS	<p>the aforementioned database creation, created a system with the possibility of future growth, in which users can utilize an article database by means of personal computer communication in the region.</p> <p>Although many newspaper companies are currently trying to create databases containing newspaper articles, they are not making much progress due to undesirable prospects and difficulties concerning cost and technology.</p> <p>The aforementioned article database has the following characteristics:</p> <ol style="list-style-type: none"> (1) Almost all of the newspaper articles are included. (2) It is possible to receive cut-out images by using facsimile, if required. (3) Kanji/Kana search methods' is used as a search system. <p>A database system that can be accessed from outside of the company was created after the following were completed:</p> <ul style="list-style-type: none"> • Members in charge explored possibilities of connecting it to other systems • A communication control device and standard software in the main system was installed • Application software
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TITLE	Construction of Commercial Coordination Support Database
CONSIGNED COMPANY	Nippon Statistic Center Ltd.
CONTENTS	<p>In accordance with the revised Large-Scale Retail Store Law, a council has been established to coordinate the opening of large-scale retail stores efficiently and effectively, in place of the present two thousand and several hundred Commercial Coordination Associations, and the period of coordination by the Preliminary and Formal Commercial Coordination Associations has been fixed at one year or under.</p> <p>The shortened discussion schedule calls for an immediate public announcement and a local briefing following a three-article notice (issued by the builder) within a maximum period of four months, and then, after issuance of a five-article notice, discussions by the Large-Scale Retail Store Council taking no longer than eight months, making it possible to complete the whole process is under one year.</p> <p>In order to avoid complications in the course of discussions and to solve all problems within a year, it will be essential to have a commercial coordination support database which is widely accessible even in small districts.</p>

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CONTENTS	<p>An information database has been built to achieve this. Covering a wide range of information from the macro level (prefectures, regions, cities, towns and villages) to the micro level (town districts and streets), the database makes it possible to search out all kinds of information according to the purpose of investigation.</p> <p>In addition, a coordinate system has been constructed to express information on geographic space. This system makes it possible to promptly obtain materials for objective evaluation on the structure of regional societies and of regional commerce, and accordingly, to investigate and evaluate, at both the macro and the micro level, plans to open large stores in high numbers, each with their own regional characteristics.</p> <p>This kind of database incorporating an information system and a coordinate system can be expected to have wide application. It will be able to handle not only commercial problems but also the formulation of various regional programs and regional analyses by private enterprises.</p>
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TITLE	Study of building up a database required for optimizing regional retail industry
CONSIGNEE COMPANY	Japan Voluntary-chain Association
CONTENTS	<p>The retail industry in Japan, especially smaller establishments may experience a severe shock due to the relaxation or a radical review of Large-Scale Retail Store Law affected by Japan-U.S. structural impediments initiatives. This new competitive condition has brought a big revolution to the shopping street on the long-established commercial location or shops gathering at shopping quarters around the station. At the same time, the factor for selecting locations for commercial facilities has converted, since consumers' purchasing behavior has transferred to 'car-shopping.' The problem of optimum location for commercial facilities has been actualized by these changes.</p> <p>On this subject, 'simulation technique' was basically adapted to build up the system searching for optimum location for commercial facilities on 'simulation technique.' Following 3 items were mainly investigated for the necessary to this approach:</p> <p>(1) Factors determining optimum location for commercial facilities</p>

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CONTENTS	<p>(2) Software supporting the creation of a database of map information used for selecting optimum location for commercial facilities</p> <p>(3) Simulation for searching optimum location for commercial facilities with the database of map information.</p>
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TITLE	Creation of Prototype of Information Source Retrieval Database
CONSIGNEE COMPANY	Central Development Co., Ltd. RUKIT (RUKO Intelligent Terminal)
CONTENTS	<p>While reorganization of on-line databases has been promoted, various reference libraries and special libraries are currently providing information services for general use. These are important information sources to support activities in the information industry.</p> <p>However, virtually no reorganization has been made of the retrieval of information sources regarding which information source has stored the necessary information. Under such circumstances, Information Library RUKIT has determined that it is necessary to have a database to efficiently retrieve attribute information (objective fields of and how to obtain stored data) regarding information sources themselves and thereby precisely lead information seekers to their information sources. To this end, an experiment should be performed to discover potential problems in the creation of such a system, as well as possible solutions. In this context, a database aimed at retrieval of information sources has been constructed, thereby constructing a prototype for consideration and study of technical and institutional problems.</p>

FIELD: Overseas

TITLE	Development of MT Data Conversion Software for Financial Statements and Relevant Japanese-English Dictionary
CONSIGNEE COMPANY	COMLINE International Corporation
CONTENTS	The project currently being undertaken is aimed at developing dedicated software capable of translating into English data financial statements prepared by the Ministry of Finance and currently sold as 'List of CD-ROM Edition Financial

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CONTENTS	<p>Statements.' Existing mechanical translation systems, however, have not reached a level high enough to translate every Japanese data item into satisfactory English. To overcome this problem, the current project was mainly aimed at developing special software for converting Japanese into English, particularly with respect to table data of financial statements, and magnetic data from the 'List of Financial Statements.'</p> <p>Parallel to this, the development and compilation of a Japanese-English dictionary for use in the above data conversion software has also been promoted.</p> <p>Of the financial statements on the List of Financial Statements, the current development was aimed at English conversion of the main four tables — (1) balance sheet, (2) earnings and expenses, (3) schedule of the cost of goods manufactured and (4) account of distribution of net profit. As shown in the attached analysis sheet, the DPC intends to continue promotion of the development of software for English conversion and the development and compilation of the above dictionary.</p> <p>Financial statements from the List of Financial Statements converted into English will be offered to enterprises handling English language financial data.</p>
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TITLE	Database Construction on Major International/National Standards
CONSIGNEE COMPANY	JAPAN INFORMATION PROCESSING SERVICE CO., LTD.
CONTENTS	<p>Information on standards is that involving standards aimed at improved quality and reduced cost of various products as well as assuring their safety, compatibility and constant performance. While remarkable progress in computers has resulted in a rise in the need for incorporating information on standards into a database, a flow of information on standards of individual countries has become increasingly important from the stand-points of the development in international trade and the progress in technical innovation. Under such circumstances, it is urgent to construct a database of information on standards useful for active economic activities, such as the development and export of products.</p> <p>To cope with this, with a view to the diffusion of overseas major international and national standards, an overseas standards database system has been constructed.</p>

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CONTENTS	<p>Data was obtained with the cooperation of the Japan Standards Association through on-line retrieval.</p> <p>The database currently constructed will greatly contribute to the progress of activities in the industrial society, likely to be positioned as an important one from an international standpoint.</p>
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TITLE	Study of Asia Pacific Exchange Database: Creation of Prototype
CONSIGNED COMPANY	Nishi Nippon Shimbun Co., Ltd.
CONTENTS	<p>In the age of internationalization, the number of foreigners visiting Fukuoka, Kyushu, from Asia and Pacific areas is increasingly on the rise. To cope with this, the current study was aimed at creating a prototype of a database system to offer information to those persons visiting for a short time. It has been decided to hold the 1995 Universiade in Fukuoka and the study targetted one system capable of being used in such international events.</p> <p>Information to offer includes: (1) emergency information (accidents, diseases, lost and found, trouble, how to use telephone, etc.), (2) information on arriving in Japan (information for foreigners, finance, traffic, accommodation, etiquette, climate, etc.) and (3) living information in Japan (restaurants, shopping, entertainment, leisure, culture, sightseeing, etc.).</p> <p>Collected data was input into a floppy disc with a wordprocessor. The data was converted into English sentences corresponding to the original Japanese through a translation program. The completed data was incorporated into a database with general purpose retrieval software 'ORION' and retrieval made possible with various items and retrieval keywords.</p> <p>Using an experimental prototype, information retrieval and maintenance were repeated and prospects for creating a practical system are considered to be positive.</p>

TITLE	Research on Database for Electronic Dictionary of Technical Terminology in High-Tech Industries
CONSIGNED COMPANY	Japan Technology Information and Evaluation Service, Inc.
CONTENTS	<p>Machine translation systems utilizing a computer have made progress from a research phase to a practical phase, where some commercial systems are already available.</p> <p>However, electronic dictionaries of technical terms in various professional fields are not yet accomplished and the formation of such dictionaries is left to individual user's effort.</p> <p>Such individual user's technical dictionaries are used only by each individual user and are not exchanged among users nor commercialized. From the stand point of the national investment, this situation implies the waste of resources. Therefore, it is urgent to develop common as a national project electronic dictionaries of technical terms in specialized professional fields and to up-date technical terminologies because the demand for machine translation will be increased very rapidly in near future.</p> <p>In this research, the frequencies of appearance and importance of most commonly used technical terms in literatures are analyzed in the fields of high-tech industries and specialized professional fields, and fundamental data which are useful to develop electronic dictionaries are to be provided.</p>

FIELD: Technology

TITLE	Constructing of Bibliography Database-Use Dynamic Thesaurus Engine, Its Application to Natural Language Retrieval System
CONSIGNED COMPANY	KINOKUNIYA COMPANY LTD.
CONTENTS	<p>There is a need for facilitating and making more efficient creation and retrieval of databases. To solve this problem, it is necessary to develop a method for a bibliography database to precisely identify and offer keywords for itself and for converting interrogative sentences written in a natural language by a searcher into the system's retrieval question patterns.</p> <p>In this theme, direct retrieval by interrogative sentences and automatic offer of database keywords have been named dynamic thesaurus and the actuator for the system named a dynamic thesaurus engine.</p> <p>Surveys and experiments of technical feasibility in the previous fiscal year found that 'meaning analysis processing' based on the systematic, hierarchical meaning classification system of</p>

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CONTENTS	<p>verbs is a key to precise extraction of keywords and that expressible active verbs are important in particular.</p> <p>In the current fiscal year, thesauri of expressible active verbs and other words indispensable for extracting keywords have been prepared and a system prototype completed with BOOK, a database for book contents information as material, in order to demonstrate the conclusion of the previous year.</p> <p>Evaluation of this system concluded that it is possible for the machine to substitute, although only partially, keywords offering operations which used to be performed artificially and that by perfecting dictionaries and rules, keywords extraction of high likelihood can be achieved.</p>
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TITLE	Research into Constructing Database Utilizing Intelligent Hypermedia
CONSIGNEE COMPANY	New Generation System Center
CONTENTS	<p>With respect to multi-use of information in a database, the need is increasingly on the rise for not only collecting fractional pieces of information existing separately but admitting relationship and similarity among them and interconnecting, based on them, related pieces of information.</p> <p>In other words, if various pieces of information, such as sound, images, documents and graphics, can be retrieved and controlled according to human ways of thinking and recognition, it will result in innovative effects in utilizing databases. In this sense, hypermedia recently catching attention can be said to be important technology for constructing a database enabling associative retrieval of information.</p> <p>To this end, the concept of intelligent hypermedia was made clear, a study was made of database technology such as an object-oriented database management system (DBMS) regarded as a new stream of DBMSs, and research into effects of hypermedia on constructing databases was conducted.</p>

TITLE	Constructing of Optical Material Database by CD-ROM
CONSIGNED COMPANY	REALIZE INC.
CONTENTS	<p>Current information processing technology, an IC where semi-conductors are integrated with high density, is approaching the limit of its processing capability, and it is eagerly desired to develop photoelectronics to break the limit. To this end, it is indispensable to develop an optical material possessing excellent characteristics.</p> <p>The current database is aimed at accumulating data on supporting the development of such new state-of-the-art optical materials and thereby supporting the development of a new optical material. The contents of the database cover every part of optical materials, thereby achieving large capacity by CD-ROM centering around state-of-the-art materials, such as laser materials, nonlinear optical materials, optical control materials, display materials and photorecording materials.</p> <p>The data includes bibliographic information, spectral information and optical constants, corresponding to contents of an approximately 4000-page book. The information source, interlocking with an 'Optical Materials Handbook,' includes important information, data and patent information catalogs unable to be included in the book as well as the entire contents of the book.</p>



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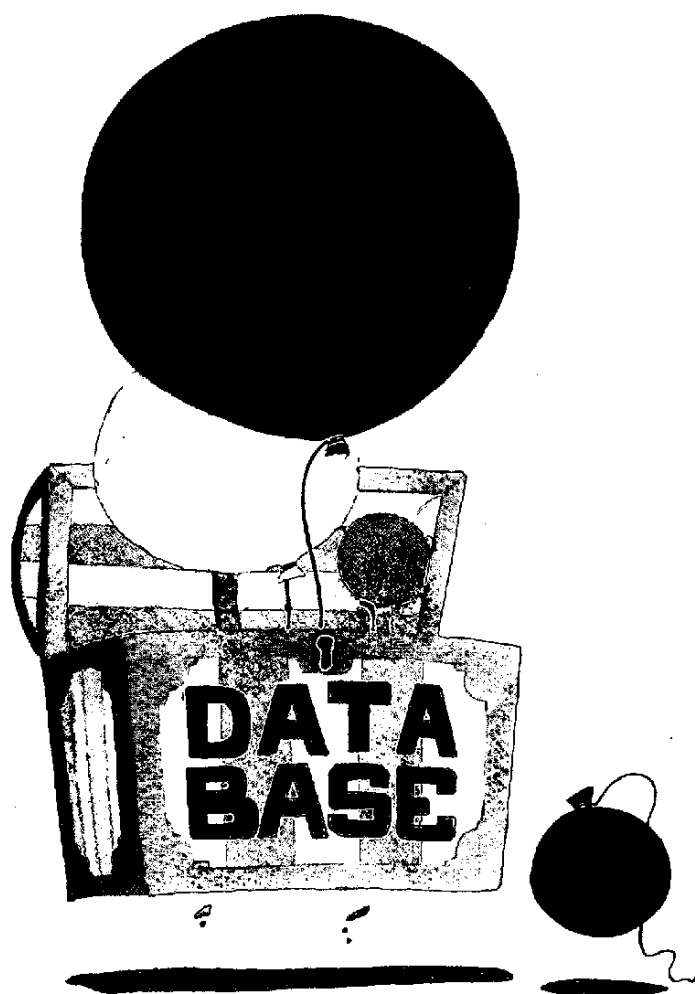
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