VTT SYMPOSIUM 152

UDC 002(520)
Keywords:
information, Japan

Japanese information

Nordic conference on Japanese scientific, technical and business information

Espoo, Finland 15-16 June, 1995
Helsinki University of Technology
Lifelong Learning Institute Dipoli
Espoo, Finland

Organised by
Science and Technology Agency (STA), Japan
Japan Information Center of Science and Technology
Helsinki University of Technology, Lifelong Learning Institute Dipoli
Technical Research Centre of Finland (VTT), Information Service
Technology Development Centre (TEKES), Finland
Finnish Society for Information Services

TECHNICAL RESEARCH CENTRE OF FINLAND
ESPOO 1995

ISBN 951-38-4543-5
ISSN 1235-9387

JULKAISIJA – UTGIVARE – PUBLISHER

Valtion teknillinen tutkimuskeskus (VTT), Vuorimiehentie 5, PL 42, 02151 ESPOO
puh. vaihde (90) 4561, telekopio 456 4374, teleksi 125 175 vttin sf

Statens tekniska forskningscentral (VTT), Bergsmansvägen 5, PB 42, 02151 ESBO
tel. växel (90) 4561, telefax 456 4374, telex 125 175 vttin sf

Technical Research Centre of Finland (VTT), Vuorimiehentie 5, P.O.Box 42, FIN–02151 ESPOO, Finland
phone internat. + 358 0 4561, telefax + 358 0 456 4374, telex 125 175 vttin sf

VTT OFFSETPAINO, ESPOO 1995

PREFACE

The Nordic Conference on Japanese Information is a unique opportunity to gain first-hand insight information about Japanese science, technology and business available in and about Japan.

The conference speakers represent a wide area of experts from all the most important Japanese information producers and database hosts, most experienced information professionals and Nordic businessmen and scholars who know Japan, its information sources and its business culture from the inside.

These Proceedings contain the papers submitted for the Nordic Conference on Japanese Information. They contain a wealth of information with sessions on demand and possibilities for Japanese information, sources of Japanese information today, successful use of Japanese information, and ways and means to success in Japan. These sessions and papers show that the cooperation and interaction between Japan and Nordic countries is growing very fast and the need of Japanese information is great. We hope that these Proceedings will enable you to share in some small way the author´s experience and knowledge.

We would like to thank all the authors for their contribution and cooperation in publication of these Proceedings for the Conference.

Espoo, June 1995

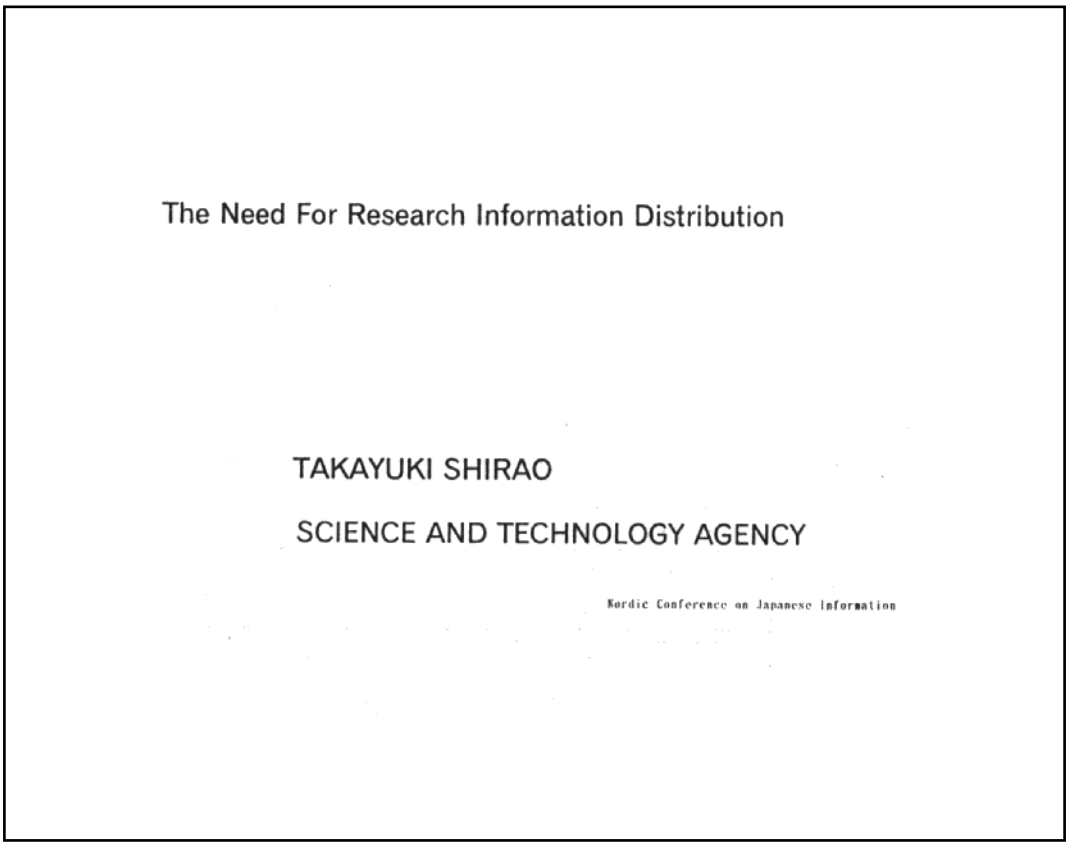
Esko Aho
Chairman of the
Planning Committee

Anna-Kaarina Kairamo
Secretary General of the
Conference

CONTENTS

KEYNOTE ADDRESS

Mr. Takayuki Shirao, Director
Science and Technology Information Division,
Science and Technology Agency (STA)
Japan

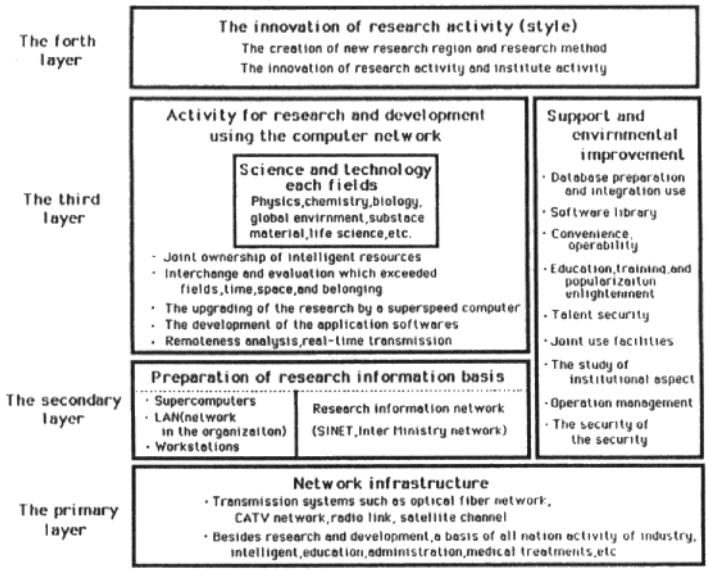


○ The Need for Research Information Distribution

→ Research Information Distributed through Networks is an Essential Resource as an Infrastructure for the Advancement of Science and Technology .

Nordic Conference on Japanese Information

Relation between the research information infrastructure and research and development activities which utilize it



Nordic Conference on Japanese Information

○ The Inter–Ministry Research Information Network (IMnet)

◇ PURPOSE: The Research Information Network connecting all governmental research institutes to promote inter–disciplinary, international R&D activities

◇ START : FY1994

◇ FUND : The Special Coordination Funds for the Promotion of Science and Technology (Science and Technology Agency)

◇ Research Activities : Network Design, Optimum Routing, Security, Network Applications, etc.

◇ PRESENT CONDITION:

- ·NODE : Tokyo, Tsukuba, Osaka
- ·BACKBONE : Tokyo – Tsukuba 6 Mbps (45 Mbps in late 1995)
  : Tokyo – Osaka 1.5 Mbps
- ·OVERSEA CONNECTION : Tokyo – USA 2 Mbps
- ·CONNECTED LABORATORIES : Networking with 80 National Laboratories of 11 Ministries
- ·CONNECTED NETWORKS : STAnet, SINET, AISTnet, MAFFIN, TISN, WIDE, BITNETJP/JOIN etc.

○ STA Home Page

address : www@sta.go.jp/welcome–en.html

contents :

Science and Technology Agency

- Role of STA
- Organization
- Budget
- Project

IMnet

○THE GLOBAL INFORMATION SOCIETY

G–7 MINISTERIAL CONFERENCE
ON THE INFORMATION SOCIETY

↓

IMPLEMENTATION OF JOINT PILOT PROJECTS

↓

TO DEMONSTRATE THE POTENTIAL OF THE INFORMATION SOCIETY
TO CONTRIBUTE TO SOLVE VARIOUS IMPORTANT ISSUES FOR
REALIZING THE INFORMATION SOCIETY
TO STIMULATE ECCONOMIC GROWTH, IN PARTICULAR IN RELATION TO
JOB CREATION

○G7 11 JOINT APPLICATION PROJECTS

(1) Global Inventory
(2) Global Interoperability for Broadband Networks (GIBN)
(3) Cross–cultural Education and Training
(4) Electronic Libraries
(5) Electronic Museums and Galleries
(6) Environment and Natural Resources Management
(7) Global Emergency Management
(8) Global Healthcare Applications
(9) Government Online
(10) Global Marketplace for SME's
(11) Maritime Information System

○ Meaning of the Research Information Network in the GII

(1) Through sharing information, research resources would be saved in each part. The interest derived from these intellectual resources will be shared by those engaged in research.

(2) Through enhancement of comminications among the researchers, inovations would be brought about and new industries would be more efficiently developed. The results could be available on a global scale.

(3) By innovating the research activities, the network would realize a "work-style revolution" (creating business beyond the range of time and space).

(4) The research network would provide an incentive to improve the infrastructure of high-capacity circuits such as optical fibers. This is because the research network requires large-capacity, high-speed communications for the transmission of high-difinition moving image, as well as for the remote operation of high-performance computers.

(5) The network would contribute to the further development of the information industry since it needs high performance of networking and computation.

○ Importance of Research Information Resources (=Contents)

"Future Measures to Improve Research Information Resources (May, 1995)"

Ad-hoc Committee on Research Information Network,
Council for Science and Technology Policy Committee,
The Council for Science and Technology

→ Research information resources (literatures, databases and software, etc.) are the intellectual products of human activity that should be systematically collected and organized and used directly and effectively at each research site.

○ Basic Policy Directions to Improve Research Information Resources

(1) Importance of development

(2) The role of the government

(3) Effective and efficient development

(4) Opening to the public and wide distribution

(5) Enhancement of public understanding

○ Policy Measures to be taken

(1) Both quantitative and qualitative improvements
Construction of high−performance databases, and encouragement of construction of databases in all research institutes

(2) Improvement of public availability and of the distribution system for research information resources
Preparation of manuals for public availability,
and development of directories and electronic bulletin board function

(3) Construction of an effective and efficient information distribution system
Improvement of efficiency in constructing databases in information service organizations

(4) Positive transmission of information to overseas
Information distribution to Asian and Pacific economies, and effective use of machine translation system

(5) Development and provision of information closely related to daily life
Database construction of information closely related to daily life and public relation activities using networks

○ Introduction of Measures to Improve Contents

◇ Development of a high−performance databases at JICST

- Assist creative research and development
- Contribute to researchers in various areas of science and technology (materials science and biological fields)

◇ Three functions of the high−performance databases

1 Creation of virtual data : Creation of new data and the presumption of missing data by computing

2 Interactivity : Interactive interfaces between developers and users for upgrading databases

3 User−friendly : Graphical interface and visualization

◇ THE JICST MACHINE TRANSLATION SYSTEM

1982～85	Mu−Project : "Research on Fast Information Services between Japanese and English for Scientific and Engineering Literature" (sponsored through Special Coordination Funds for the Promotion of Science and Technology)
1986～90	Development of a practical machine translation system(Mu− II)
1990～	Used in the production of JICST's English database
1993～94	Development of machine translation system for workstations and personal−computers
1995～	Introduction of translation services using networks such as Internet

THE TECHNOLOGY TRANSFER BETWEEN JAPAN AND THE NORDIC COUNTRIES

Dr. Pauli Heikkilä, Director, Information Technology
Technology Development Centre, TEKES
Helsinki, Finland

1 GLOBALIZATION OF BUSINESS AND TECHNOLOGY

No country in the world is operating in a closed market today. Like investments and technologies, information is moving around without any borders or limits. The competitiveness of a company depends more and more on its ability to act as a player in the global market. This holds true even for SME's.

Instead of national, international competitiveness is required for all industries. At the same time, the localization of products is becoming vital for good penetration in each market.

For Japan, the competitiveness in low cost mass production is not the main target anymore. Many Japanese companies have taken a global approach to be successful in the world market. Business administration is growing to awareness of global thinking and networking. We believe that the time is right for new co-operation initiatives between Japan and the Nordic countries.

2 COUNTRIES OF TECHNOLOGY

The Japanese growth was previously based on effective use of imported foreign technologies adapted to the Japanese market. Especially this is true for manufacturing engineering.

In 1993, Japan became a net exporter of technology and is today a major source of technology in various fields like automobiles and electronics.

There are still areas where Japan is dependent on foreign technologies, e.g. software and microprocessors.

There will be many detailed presentations of Nordic technologies during this conference and exhibition. Let me, however, underline here a few dramatic changes that have taken place in Finland during the last few years. The Finnish R&D expenditure rose from 1.3 % of GNP in 1983 to 2.2 % in 1993. High-tech exports have risen from just 4 % of total Finnish exports in 1980 to 16 % in 1994. Especially, the rapid growth of electronic and electrical industries as well as telecommunications must be mentioned.

3 JAPAN AND THE NORDIC COUNTRIES AS TECHNOLOGY PARTNERS

Table 1. Technology trade between Japan and the Nordic countries in 1993 in mill JPY.

	Export from Japan	Import to Japan	Total volume
Denmark	300	2 600	2 900
Finland	500	80	580
Norway	60	330	390
Sweden	600	2 400	3 000
Nordic total	1 460	5 410	6 870

The Japanese exports to Nordic countries is only 0.4 % of the total export volume and the Nordic technology imports to Japan is 1.5 % of the total technology import volume.

In spite of the small volumes, Japan imports Nordic technology about three times the amount it exports. The Nordic countries seem, accordingly, to be a good source of useful technology.

Denmark has exported medical and chemical products and transportation equipment to Japan. Finland has exported machinery technology and imported electronics technology. In recent years, Finnish telecommunication, computer and medical technology companies have made important

new breakthroughs and co-operation initiatives in Japan. Norway has exported technology for transportation industry and imported iron and steelmaking technology.

4 MECHANISMS FOR TECHNOLOGY TRANSFER

There are very few established, standard ways of taking care of technology transfer. The methods utilized vary a lot between companies and countries. Information can be acquired through private contacts, public databases or by giving assignments to consultants. Without information there is no business.

There are remarkable differences in the extent to which countries and their technologies are known to one specific market. The Nordic countries, their companies and technologies are not well known in Japan. This means that governmental organizations like TEKES will have a significant role in promoting the global flow of technology especially among the SME's. This is why we think conferences like this can have an important role in building the future success for Nordic and Japanese companies in the global marketplace.

THE JAPANESE INFORMATION SOCIETY - PROSPECTS AND PROBLEMS

Paul Lillrank, Professor
Dept. of Industrial Management, Helsinki University of Technology
Espoo, Finland

Affiliated Professor,
The European Institute of Japanese Studies at
the Stockholm School of Economics

INTRODUCTION

Since the first computing machines emerged from government laboratories in the 1950's social scientists, technocrats and visionaries have speculated about the coming of a new society. It has been labelled as "Post-Industrial Society"[1], "The Third Wave of Civilisation"[2] and "The Information Society"[3]. Common to all these views is an assumption that new possibilities of creating, analysing, storing and distributing information will radically change the structure and functioning of society, including government, businesses and the daily lives of the majority of people.

Japan has played a significant role in this effort and was the first nation to take the step from futurists' visions to proclaimed intentions. "The Plan for Information Society: A National Goal toward the Year 2000" was published already in 1971. National plans were erected including "new towns" and "information society infrastructures" like Computopia and Technopolis. The Fifth Generation -vision of thinking computers was to propel Japan into the forefront of technology. The private sector established its own visions, such as NEC's "Computers and Communications" and Hitachi's "Human Electronics".

---

1 Bell, Daniel: The Coming of the Post-Industrial Society

2 Toffler, Alvin: The Third Wave

3 Masuda, Yoneji: The Information Society

Lacking natural resources the Japanese were acutely aware of the fragility of their economic base and saw information -based industries as a possible solution to the dangers of being dependent on imported raw materials. Until recently viewed as the society which would be the first to enter the information age on a broad scale. Japan was assumed to have all the necessary building blocks of an Information Society: a strong electronics industry, sound fiscal policies, exciting government visions and mega-projects, and an education system producing diligent and literate workers. The vision of a Japanese Information Society was at its height in 1986 when the piano-playing robot and other wonders of technology made their debut at the Tsukuba Expo.

THE SLOW LANE ON THE INFOBAHN

Recently, however, the Japanese progress towards the Information Society has slowed down. The computer and software industries have run into problems and are defending themselves against more nimble and technologically sophisticated American rivals, which have penetrated even the Japanese home market. Further, the actual use of information technology in the Japanese society - which indeed should be the key factor - is less than in the U.S. and other advanced nations, such as the Scandinavian countries. Most available indicators tell that Japan is far behind: the mobile phone penetration rate is 18 in Sweden, 3 in Japan; in the U.S. there is one computer per 19 children while in Japan 36 kids share one; in the U.S. there are about 15 000 educational software titles against 2 500 in Japan; the Japanese contributions to the World Wide Web (WWW) are fewer than Finland's; 70 % of PC's in America are connected to networks, only 17 % in Japan.[4]

The changes affecting the information industry come basically from two sources. First, the rapid improvement of technology means larger memories and faster processors, which in turn enables faster data transmission and more sophisticated applications. Consequently the structure of the hardware market has changed from mainframes towards host-server networks.

---

[4] Nikkei Business, 21.3.1994

Second, market-technology interactions have changed the power balance from producers to users. Market pressure has forced manufacturers to adopt open systems and global standards, such as MS-DOS and UNIX, which in turn has turned hardware into a commodity and made the software and solutions -business the most lucrative part of the industry.

These two forces manifest themselves in downsizing and open systems, which very seriously have challenged the fundamentals of the Japanese computer and software industries, which, for historical reasons, were based on diametrically opposite principles: large-size mainframes and closed, proprietary systems and custom software development. This also indicates that the Information Society is more about software than hardware, and that the historical neglect of software in Japan starts to become a serious obstacle for the Information Society vision. The Japanese government has initiated a number of programs to remedy the situation.

THE STRUGGLE AGAINST IBM AND THE HUB STRUCTURE

Since the 1960's the computer industry has been one of the industries targeted for growth by the Japanese government. The industry falls under the guidance of the Ministry of International Trade and Industry's (MITI) Machinery and Information Industries Bureau. The industry was nurtured by using a set of industrial policy tools frequently used in other industries as well, such as infant industry protection, joint research projects for basic and pre-competitive technologies, industry restructuring initiatives, financial support and various episodes of indirect guidance. As Anchordougy[5] concludes, without MITI the industry would have foundered on several occasions.

Since the early 1960's, the major target of MITI and most of the industry has been to catch up and bypass IBM. Big Blue provided the Japanese with a worthy opponent and helped focus their efforts. In hindsight, the IBM -fixation had its costs. While establishing a technology benchmark, IBM also provided a price umbrella under which the Japanese companies could

[5] Anchordougy 1989, p. 166

concentrate on technology catch-up which was financed by captive customers fenced in by incompatible operating systems. As a result the Japanese industry developed a strong mainframe culture, which it has been slow to depart from even after IBM itself started to have problems.

THE HUB STRUCTURE

Customised software goes hand in hand with the mainframe culture. Baba et al.[6] have developed a model of the Japanese software industry that they call "User Driven Hub Structure". It works as follows:

Major computer users have relatively large in-house resources and a number of spin-offs knowledgeable of specific applications. These design basic structures and establish specifications, based on their expertise of the operational requirements from the shop-floor level and up. System engineers, both those on the user and the supplier side, are usually trained on the job. The initiative to develop a system comes from the user, hence the "user-driven paradigm".

The user group works closely with a hardware vendor in developing new systems and modifying existing ones. The hardware manufacturer manages software planning, design and production, which is often farmed out to its spin-offs or related independents.

A long -lasting relationship develops. Continuous rounds of incremental improvement and software maintenance results in finely tailored software that is well adapted to the particular needs of the user. As a consequence, the computer system is deeply embedded in the work structure making radical changes difficult and dangerous.

BUNDLES

The Japanese software industry - as similar industries elsewhere - grew out of the computer industry. In the early days of computing when processors

---

[6] Baba et al. 1993

and memories were not large compared to the situation today, users frequently wrote their own software. If you bought a machine, you could get some software for free. Hardware and software was bundled together into one package deal.

IBM was forced under antitrust pressure to "unbundle", that is, sell and price software separately from hardware already in 1969. Beside the threat of litigation, unbundling made sense because of the growing complexity and increasing costs of software development

A major consequence of the unbundling decision was that IBM's competitors could with renewed force go into the business of building IBM-compatible machines that could tap into the huge libraries of IBM software. IBM thus was forced to help its competitors, however, the decision helped in creating an independent market for software and offer incentives for independent software producers. Thus the value of software as a product in its own rights was recognised little by little. With a larger installed base of hardware to work towards, software prices started falling creating more demand, further enforcing the virtuous cycle. In order to realise scale economics in software development and distribution, packages and semi-standard products were developed leading to a situation where software could be bought off the shelf just like a calculator or a can of beans.

The infant Japanese computer industry fenced in its customers with a diversity of OS platforms. NEC has its own operating system while Fujitsu and Hitachi are formally IBM compatible, but *de facto* their systems do not work together with others. Thus customers face formidable switching costs. Had the Japanese opted for common international standards, the industry may have been wiped out at an early stage.

Under pressure from the Industrial Structure Council the Japanese major hardware manufacturers formally unbundled software and hardware in 1977[7]. This remained largely a formality; hardware manufacturers established their own spin-offs, but de facto a large part of the market has remained bundled within the hardware manufacturer's corporate sphere of

[7] Baba et al. 1993, p. 4.

influence, or keiretsu[8]. In contrast to the development in the U.S. and other Western economies, a majority of Japanese software developers never really cut their apron strings to hardware makers.

The advantages of bundles for hardware manufacturers are obvious. Proprietary operating system platforms lock in captive customers and make monopolistic pricing possible. Hardware manufacturers have an interest in pushing their machines and expanding installed base even at a loss. Software development cost can be cross-subsidised if needed, leaving system maintenance - post-delivery development - as the major source of revenue.

THE MEGAPROJECTS

It took a while before Japan Inc. discovered software. Since the mid-sixties, several major software or software -related projects have been undertaken and an organisation, Information-technology Promotion Agency (IPA) has been created. Of all these efforts, only the Next Generation Computer Technology -project can be called a success. It was a 5-year (1976 - 1983) 47 B¥ program focusing on Japanese language processing. It created some of the technologies that contributed to the solution of Japanese language computing which resulted in the very successful word processors and other applications. Virtually all other projects have been technology driven with very little serious interest in what users would benefit from the projected innovations. The industrial policy track record in software has been oscillating between modest success and grand failure.[9]

CONSEQUENCES

The hub structure is a strength if one wants to build a hardware-dominated industry. The serious strategic consequences of this development have become apparent only recently when the relative importance of hard- and software is about to change.

---

[8] Interview with Mr. Yamadori, JIPDEC, 1993

[9] See Anchordougy 1989 and Cusumano 1991 for details

The advantages are limited to the large users who can afford sizeable in-house computer resources. Finely tailored systems become expensive and lock out competition. There is relatively little competitive pressure because customised software is not easily tradable and users face formidable switching costs. Problems become apparent in increasing maintenance, operations & management costs. Prices of packaged software are high because a diversity of OS platforms keeps the respective markets small; available packages are not easy to use because of undeveloped packaging technologies. Individuals and small businesses with lesser resources are forced to pay through the nose or get by without computers, as is evident from the surprisingly low penetration rates of personal computers in Japan.

Bundles also have the tendency to inhibit radical changes and introduction of new, improved technologies. Reliance on on-the-job training does not provide incentives for advanced theoretical training for software engineers. The finely tailored software is another aspect of Japanese strategies that emphasise productivity and neglect the innovative and market-creating perspectives crucial to packaged software.

THE INDUSTRY CHANGES

DOWNSIZING

The simultaneous physical shrinking and performance expansion of computers is a technology driver. Industry has applied it as “downsizing”, a trend away from large centralised machines towards smaller and decentralised systems with personal computers and workstations linked together with networks and client servers. The traditional mainframe is disappearing from ordinary business applications and evolving towards a niche of very large supercomputing systems.

The organisational consequences of downsizing is end-user computing, which means that data processing is done by designers, engineers, market planners, payroll administrators and accountants directly at their own desks instead of the traditional centralised electronic data processing departments (EDP). End-user computing makes flatter organisations possible as

operators can handle whole tasks without co-ordinators and supervisors. The Information Society becomes visible in redesigned business processes.

OPEN SYSTEMS

Another fundamental trend is the drive towards open systems, that is, a common operating platform which allows various computers to communicate with each others and makes data and applications interchangeable over various installations. This, however, is not a technology, but an user-driven trend. For users, open systems have several benefits:

- hardware and software from several different sources can be combined into “multi-vendor” systems
- competition between vendors drives prices down
- users do not have to learn new operating systems from the ground up when they move to a different environment or install new application software
- a common operating system platform provides market incentives to software developers to launch new products thereby increasing the supply of software applications.

For industry, open systems are not only positive. Competition increases cutting into profit margins. However, the trend towards open systems is irresistible because of the increasing power of a large heterogeneous market. Further, it has become apparent that no single company will have the resources to develop the very complicated user-friendly intermediate software that users are demanding. Even large players, such as IBM and Apple, are joining forces in product development. It is therefore no wonder that the Japanese hub structure locking in users to proprietary systems has been a brake on development.

The immediate consequence of open systems is that hardware becomes a commodity. When one PC can run the same software as well as another, “the box” offers few sources of differentiation, and competition is driven mainly by price. Software and service become the prime source of differentiation and the area where money is made.

Commodity business in a fast-developing high technology area becomes an enormous driver of development. The only chance to make money is to constantly innovate and get a new product generation out fast and milk it dry before the crowd of copiers catches up. The speed of development is the single most important reason why the Japanese have not been able to get a foothold in the U.S. PC business.

In the new world, the relative importance of software increases dramatically. Simultaneously, the downward price pressure on software intensifies. When a PC can be acquired for a few thousand dollars, nobody wants to invest huge sums in the software that runs on it. As software still remains a design intensive activity where manufacturing is simply to make copies, distribution and installed base become key competitive factors.

The brutality of the change forces hitting the Japanese industry can be illustrated by the tidal wave of American personal computers hitting the Japanese market.

THE *KUROFUNE PASOKON* AND THE DOS WARS

For years the Japanese PC market had been a cosy world dominated by NEC and its line of computers priced about twice as high as comparable machines elsewhere. All five major producer groups, NEC and its clone-maker Seiko Epson, Fujitsu, Toshiba, IBM Japan and the AX Group including Mitsubishi Electric, Sanyo and Sharp, had their own "cultural zones" of MS-DOS based incompatible operating systems. This is because when MS-DOS was modified for Japanese-language use, dialects came into existence effectively fencing in each group's own customers[10].

In October 1992 this cosy world was rocked to its foundations. Compaq, which had re-emerged from the brink of bankruptcy as the paragon of a cost-effective super-fast producer of IBM-compatible PCs, announced its ProLinea i386 SX for ¥ 128 000. The price was about half of comparable NEC machines and it sent shock waves through the industry. IBM Japan responded within weeks with its PS-V model priced at ¥ 198 000. When

[10] Tokyo Business Today, December 1991

Dell Computer announced its basic entry-level model for ¥ 98 000 in January 1993, there was no turning back from intensive price wars.. The Japanese business press [11] called this the " *Kurofune Pasokon*", Black Ship Personal Computer.

NEC first tried to stonewall and claimed that Japanese consumers are not price sensitive and will pay a higher price for quality, brand name, safety and service - arguments familiar from many other debacles, including the question of imported rice. Eventually NEC had to give in. It announced its FELLOW series, a minor repackaging of its standard 98-line, at a price 100 000 ¥ less than its predecessors that were selling in the 250 000 -range.

The dramatic changes were made possible not only by the price-battle hardened American manufacturers, but by developments in software.

In October 1991, IBM and a consortium of PC manufacturers launched a new operating system for PCs, called IBM-DOS Version J4.0/V, or DOS/V for short. It is a bilingual operating system based on the IBM PC/AT standard, developed for the Japanese language with the explicit purpose of breaking NEC's stranglehold on the Japanese market [12] . It can display Japanese characters without a special Kanji ROM thereby allowing IBM PCs to run Japanese software. It can also run DOS applications written in English, thereby allowing Japanese users to tap into the huge world-wide supply of DOS software. As a consequence, DOS/V computers were brought up to the Japanese-language standard set by NEC's PC98 -line in addition of having common DOS standard.

For about two years, the DOS/V standard was promoted only by IBM and other American computer manufacturers interested in breaking into the Japanese market. The *Kurofune Pasokon* price war was only the second skirmish in this battle.

---

[11] Nikkei Business 2.8.1993; Choy 1994, Kouyoumdjian 1993, Japan Economic Almanac 1993 and 1994. "Kurofune" refers to the Black Ships of the U.S. Commodore Perry which opened feudal Japan to the outside world. The term is highly emotional in Japan symbolizing a grave external threat.

[12] Interview with Mr. Yamaoka, IBM Japan, Japan Economic Almanac 1993, pp. 84-86

In May 1993, Microsoft released Windows 3.1J, a Japanese language version of its popular graphic user interface. As a front-end addition to DOS/V, Windows 3.1J offers a friendly Japanese language interface and runs programs written for MS-DOS and NEC PC98 computers as well. In one stroke, Microsoft destroyed the hardware and software incompatibilities that had fragmented the Japanese market.

Windows 3.1J has sold well in Japan and has spurred the sales of packaged software, some 70% of it developed in America and adapted for Japanese users. Street prices of packaged software tumbled 30 - 40 % [13]. American hardware and software manufacturers are making steady progress in the Japanese market.

NEW GOVERNMENT INITIATIVES

The weakness of the Japanese software industry has become apparent during the recent radical changes in the industry. For the 1990s, MITI[14] foresees the open systems and downsizing trends to continue. The centre of profitability moves from hardware to software causing severe adjustment problems. MITI laments that "hardware vendors can't present a credible vision of the future". Therefore MITI, as many times before, set out to define the future and establish a common vision and an action program.

The Information Industry subcommittee of MITI's Industrial Structure Council created a Basic Policy Subcommittee chaired by professor Kenichi Imai of Stanford University. Intensive deliberations started in October 1992, around the time of the *Kurofune Pasokon*. The subcommittee had 17 members representing major computer manufacturers, academia, software vendors and users, including IBM and Microsoft. A policy outline was compiled in December and published in February 1993 as "Urgent Proposal for the New Age of Software". As a second step, the Basic Policy Subcommittee created a work group, chaired by Professor Ryuhei

---

[13] Nikkei Weekly 2.8.1993

[14] The discussion is based on the MITI policy papers: *Kinkyu Teian Softowea Shinjidai* 1993, *Softowea Teiseina Torihiki o Measshite* 1993, and *Softo Shinjidai to Jinzai Ikusei* 1993

Wakasugi of Yokohama National University, to work out a detailed proposal about transaction rules. The policy recommendation was published in July 1993 and MITI issued a set of "administrative guidance" recommendations for the industry [15]. In November 1993 a report concerning human resource development in the industry was published by the Human Resources Policy subcommittee [16]. In the summer of 1994 even more vision papers were published by MITI and MPT outlining different visions of the New Information Infrastructure.

In sum, MITI's aim is to "aggressively implement" various measures to create a market mechanism for customised software by enforcing transparent and credible transaction rules, publishing intra-industry benchmark studies, improving the human infrastructure by training and qualification schemes, pumping money into package development, and paying closer attention to intellectual property rights.

In contrast to many earlier schemes in the information industry, this time trade politics is not involved. The "Urgent Proposal" is rather clear on the point that foreign software companies are expected to invigorate the Japanese market:

> "A framework in which both Japanese and foreign vendors can produce high value added software products must be firmly established.....It does not make a material difference whether successful vendors are Japanese or foreign; rather it is necessary to recognize that promoting new entries into Japan's software market by making rules more internationally compatible will help add depth and breadth to the market."

The vision papers of 1994 [17] build on the previous suggestions, and add an emphasise on the government's role in promoting information technology in the public sector while admitting that the private sector should have the initiative

---

15 *Kanpo* 14.7.1993, No 116; Wakasugi, 1993, p. 33

16 MITI: *Softo Shinjidai to Jinzai Ikusei* 1993

17 MITI 1994, MPT 1994

"The Advance Information Infrastructure society will be materialised by users making active efforts to promote the introduction of information systems and by information-related industries supplying advanced products and services. in a diverse, advanced, and seamless network environment prepared by private sector."

MARKET MECHANISMS FOR SOFTWARE

Since Japan's weakness in software is mainly caused by cosy oligopolies offering expensive hard-soft bundles to captive customers, the obvious thing to do is to break the hub structure and establish a free market for software, that is, to promote the possibility of multi-vendor systems. With open and functioning markets, the fair market value of software can be established, thereby providing incentives to software developers. In the PC market this has already been achieved by the DOS War and the definite move towards packaged software. For the users who need tailored systems, a set of transaction rules are recommended, that hopefully will spur honest competition and technology development and educate users to realise the true functional value of software as a product in its own right.

Basic rules for implementation of this scheme were published as MITI's administrative guidance in July 1993. It includes recommendations for models to be used in contracts following the principles of transparency and credibility, such as requests for proposals, nomination of formal project managers, definitions of development steps and schedules, required documentation, rules for multi-stage contracts and so on. Standardisation of proposals and contracts makes it possible for customers to compare competing bids.

MITI's guidance does not imply evaluation of the merits of any particular systems or technologies used. That is left entirely to the market to decide.

In addition to general principles and recommendations, a number of institutional arrangements will be necessary. The question of cost accounting and pricing guidelines is obviously very difficult. The upper limit of price is equal to the utility to the user and the lower limit is actual production cost: obviously the range can vary enormously. However, by

making the system transparent, market forces can potentially work to establish acceptable solutions. To this end, a few institutions need to be created for public evaluation of software vendors, human resource development, capital supply to software development and research, strengthening of anti-monopoly vigilance, and finally creating a better legal environment for the protection of intellectual property rights. In order to help software buyers choose between suppliers, a third-party evaluation of unit-costs and skill grades of software engineers should be made public. In a similar vein, full disclosure of technical information should be made in bids for contracts.

INTELLECTUAL PROPERTY RIGHTS

Intellectual property rights and anti-monopoly rules have not been strictly observed in the Japanese business environment. If intellectual products and information are not valued as products in their own right, it comes naturally that property rights get little respect. According to estimates by the U.S. Business Software Alliance, the software piracy rate in Japan is 92 % - the highest among developed countries (Italy 86 %, Germany 62 %, Korea 82 %) the equivalent of 3 billion $ losses to U.S. software houses in annual revenues[18]. With the U.S. as the largest producer of software, the intellectual property right issues is a hot trade problem and is bound to become more serious. Therefore MITI foresees more *gaiatsu* (foreign pressure) in this area.

Intellectual property rights is not only a trade issue, it also worries the domestic software producers. In a market where software piracy is rampant, developers are robbed of the rewards for their efforts, further weakening incentives to invest in developing new applications. The Japan Personal Computer Software Association[19] is actively lobbying for stricter protection. MITI basically agrees saying that “illegal copying must decrease ... the lack of social awareness of private property rights to software is a major obstacle”.

---

[18] Nikkei Weekly 2.8.1993

[19] Interview with Mr. Furuta, The Japan Personal Computer Software Association

IMPLEMENTATION

MITI states that structural changes of this magnitude are painful, therefore they should be implemented under conditions of growth and expanding demand. Restructuring and demand stimulation should proceed simultaneously. Packaged software developers will constitute the pillar of the software industry. They suffer from capital shortage, but it is expected that some government supply of "venture capital" through IPA and increasing demand for packages will cover this weakness. The total budget for various industrial policy measures in the Information Service Industry was about 7 billion ¥ in 1993[20]

MITI makes no bones of it that restructuring will lead to tougher competition, where the weakest and most unfocused players will be weeded out.

INDUSTRY RESPONSE

Japan Information Service Industry Association (JISA) asked companies about their views on various changes, including the proposed new cost accounting and technology evaluation methods. Only 8 % of the 228 firms surveyed thought the changes would be implemented within three years, 33 % believed it will happen within five years and the majority, 42 % expected it to take ten years[21].

Roughly three quarters of the companies believe that within ten years the following things will happen:

- Computer Aided Software Engineering (CASE) will reduce demand on software professionals,
- there will be more than a million female software professionals,
- outsourcing and other services will be 20% of the total Information Service market,

---

[20] *Joho Saabisu Sangyo Hyakusho* (White Paper on Information Service Industry) 1993, p. 387

[21] JISA: *Joho Saabisu Sangyo Kodo Chosa* 1992, in *Joho Saabisu Sangyo Hyakusho* 1993.

- packages will be half of the software market,
- there will be a consolidation in the industry with the top twenty companies commanding more than half of the market (25 % in 1992), and
- general consumers, home users, will constitute 20 % of the market.

DISCUSSION

The Japanese example offers a number of lessons and insights into the future of information society. The view here is that Japan's problems and prospects are primarily related to industrial policy, industry structures and corporate strategies. The often proclaimed culturalistic view that the Japanese are not creative enough to write innovative software can be refuted by pointing at the case of the computer game industry. Nintendo and Sega created, without any inference from the government, an industry structure that allows free competition and provides incentives to creative software writers.

The role of the government in fostering Japan's economic strength has been subject to much debate. The "Mighty MITI" -school of thinking emphasising the role of elite bureaucrats in shaping and nurturing industrial development through wise capital allocation, informal policy guidance and perceptive vision-making. On the other hand there is a view that Japanese companies have succeeded despite government inference, that industrial policy might have worked during the post-war rebuilding of basic industries but not any longer. The computer and software industries illustrates both points: without an active industrial policy there would probably not have been a Japanese computer industry today, however, the same kind of policies locked the industry into a rigid structure that has seriously damaged Japan's possibilities to lead the information society into the 21st century.

MITI's attempts to reform the software industry is part of a long tradition of government-industry co-operation in Japan. The question remains, will the proposed policy measures have a significant impact in invigorating the Japanese software industry and pave the way to the Information Society. In the best cases, industrial policy has been market conforming and simply accelerated and co-ordinated existing business momentum. On the other

hand, even free-market purists should admit that markets may be inefficient and industry structures perverse; if the government can help in deregulating and reinvigorating an industry, it should do so. This, indeed, appears also to be the way MITI is re-defining its role as the government agency most forcefully promoting deregulation as the route towards the Information Society.

LITERATURE

Anchordougy, Marie: Computers, Inc. Japan's Challenge to IBM. Council of East Asian Studies, Harvard University, Cambridge, Mass., 1989.

Baba, Yasunori, Shinji Takai, Yuji Mizuta: The User-driven Evolution of Japanese Software Industry: The Case of Customised Software for Mainframes. International Computer Software Project, Berkeley (manuscript).

Bell, Daniel: Coming of Post-Industrial Society, Penguin 1974.

Choy, John: Japan's Personal Computer Market: Awash in American Tsunami. JEI Report No 6A, February 11, 1994, Japan Economic Institute, Washington, D.C.

Cusumano, Michael: Japan's Software Factories - A Challenge to U.S. Management. Oxford University Press, New York 1991.

Japan Economic Almanac 1993 and 1994, Nihon Keizai Shinbun, Tokyo 1993 and 1994.

Japan Electronic Industry Development Association (JEIDA): 2001 Nen no Komputa Systemu Gijutsu ni Kansuru Chosakenkyu. JEIDA, Tokyo 1992.

Japan Information Service Industry Association (JISA): Downsizing, Open system ga Joho Sabisu Sangyo ni Motarazu Eikyo ni Kansuru Chosakenkyu - Korekara no Keieisenryaku to Jinzai-ikusei no Shishin. Joho Sabisu Sangyokai, Tokyo 1993.

Joho Sabisu Sangyo Hyakusho 1993. Japan Information Service Industry Association (JISA): Joho Sabisu Sangyo Kyokai, Tokyo 1993.

Johoka Hyakusho (Informatization White Paper), Japan Information Processing Development Center (JIPDEC), Tokyo 1993.

Kouyoumdjian, Virginia: Waves of Change - The Personal Computer Market in 1993. Journal of Japanese Trade and Industry: No. 3, 1993, pp. 35 - 37.

Masuda, Yoneji: The Information Society as Post-Industrial Society., Bethesda MD, World Futures Society.

Ministry of International Trade and Industry (MITI): Tokutei Saabisu Sangyo Jittai Chosa Hokokusho - Joho Saabisugyo Hen, 1992.

Ministry of International Trade and Industry (MITI) (ed.): Wagakuni Joho Shori no Genjo. Heisei 4-nendo Joho Shori Jittai Chosa. Okurasho Insatsukyoku, Tokyo 1993.

Ministry of International Trade and Industry (MITI), Machinery and Information Industries Bureau (ed.): Kinkyu Teian - Softowea Shinjidai. Tsushosangyo Chosakai, Tokyo 1993.

Ministry of International Trade and Industry (MITI), Machinery and Information Industries Bureau (ed.): Softowea no Tekiseina Torihiki o Mesashite - Sangyokozo Shingikai Joho Shori Sangyo Bukai Hokokusho. Komputaa Eji, Tokyo 1993.

Ministry of International Trade and Industry (MITI) Machinery and Information Industries Bureau (ed.): Softo Shinjidai to Jinzai Ikusei. Tsushan Shiryo Chosakai, Tokyo 1993.

Ministry of International Trade and Industry (MITI) Machinery and Information Industries Bureau (ed.): Kodo Johoka Purogramu. CA Computaa Eiji, Tokyo 1994.

Ministry of Posts and Telecommunication (MPT): (ed.) 21seki no Chiteki Shakai e no Kakumei. CA Computaa Eiji, Tokyo 1994.

Nikkei Business 2.8.1993: Monozukuri Shinwa no Houkai - Aratana Kokusaikyoso ga Hashimatta. Pp. 10 - 24.

Nikkei Weekly, 2.8.1993: Copyright Law Proposal Worries U.S. Software Sellers.

Sobel, Robert: IBM vs. Japan - The Struggle for the Future. Stein & Day, New York 1986.

Toffler, Alvin: The Third Wave. Pan, London 1980.

Tokyo Business Today, December 1991: PC Software Revolution: Will It End NEC's Sway? Pp. 52 - 54.

Wakasugi, Ryuhei: Software Transactions. Journal of Japanese Trade and Industry: No. 5, 1993, pp. 32 - 33.

THE CURRENT USE AND DEMAND OF JAPANESE INFORMATION BY SWEDISH COMPANIES

Ms. Lise-Lotte Lindskog, Head of Information Services
CelsiusTech AB
Järfälla, Sweden

Abstract

A summary is given of CelsiusTech's interest in Japanese information. Language problems and efforts to solve these are described. I will also give some examples of databases produced both in Japan and outside, in Japanese as well as in English.

The Japanese language is not particularly easy to learn, at least not for a middle-aged lady with a full-time job, a family, and a dog... After having tried for eight years with a very patient teacher, I have finally given up.

It all started about ten years ago when there was suddenly a great demand for information from Japan from Japanese-language sources in my company, which at that time belonged to the Dutch conglomerate Philips. I have been searching online in databases all over the world for over twenty years, but up to then I had only searched for Japanese information in English. I contacted the Research Policy Institute at Lund University in order to support its endeavour to make searching in Japanese databases easier, and subsequently also to machine-translate database records from Japanese into English together with my colleagues in Sweden's largest companies.

During the years I have made several trips to Japan to visit database and system providers, online hosts, and above all suppliers of machine-translation software. I bought the Bravice MT-software for PC and later had the opportunity to participate in a research project testing the HICATS/JE system developed by Hitachi. The two MT systems are quite excellent but they have quite different ways of translation. They are equally easy to use

but there is the same drawback: One simply cannot manage without knowing Japanese.

I had big hopes ten years ago that I would be able to manage without Japanese-speaking staff just by learning a few key words in Japanese, search Japanese databases with a Kanji terminal, translate the results with either the Bravice software or HICATS/JE and if I would find some interesting article, order a manual translation. Language should really not be a problem when searching a database especially not searching Japanese ones which, from what I have seen, are well developed and indexed, and of high quality. I have also been waiting for a 'black box' which would translate my search from English into Japanese automatically before reaching the Japanese database and then do the reverse with the search result, but this has not yet materialized as far as I know. I have now given up...

What kind of information are Swedish companies looking for? I can only answer for myself and my company but the answer is probably also valid for most companies... My company CelsiusTech belongs to Celsius, the Swedish group of defence companies which includes Bofors, the world famous gun and weapon systems manufacturer, and Kockums, known for their submarines using the Stirling engine. Celsius has 15 000 employees and is privately owned. CelsiusTech is situated at Järfälla outside Stockholm and our main products are Command and Control Systems principally for naval forces, e.g. for the ANZAC frigates, as well as avionics for Swedish, American and European fighters like the Tornado. My department handles more than a hundred requests per day. Our 'clients' belong mainly to the R&D, the Purchasing, or the Marketing departments. The clients' top questions are: How do I solve this specific technical problem? Has any other company this type of product? Can you find me a manufacturer or supplier of this type of tool or software? What are the current trends in manufacturing, management, quality control? Please give me all there is to know on this country, this company, this technology, this product? What is the specific property of this specific material, and could you give me all relevant articles on it?

Most answers to questions are found in English language databases on the big online hosts but occasionally one has to rely on local hosts all around

the world. This is where the Japanese language creates a problem. There is so much research to be learned, so many methods to become acquainted with, and so many partners that have to be found in Japan, that I feel quite inadequate in my job, not being able to search Japanese databases as well as Swedish, English, French, or German. So where do I search for specific Japanese information?

When it comes to Japanese language databases, I am able to search PATOLIS since each keyword has a specific number which I can put in instead of having to produce a string of kanji.

Of the strongly reduced English language versions of databases produced in Japan, I have access to COMLINE, JAPIO, JICST, NIKKEI, and TEIKOKU.

Outside Japan there are quite a few good databases with adequate coverage of Japanese sources namely INSPEC, CA SEARCH, WORLD PATENTS INDEX, NTIS, KOMPASS ASIA/PACIFIC. There are also quite a decent number of newsletters and news bulletins in full text produced in Japan as well as outside, namely ASAHI NEWS SERVICE, KYODO ENGLISH NEWS SERVICE, and a number of sources on NEWSNET and in the PTS NEWSLETTER database. There is also excellent information to be found in the specific subject-oriented databases which are used by specific companies. I use, of course, quite a few databases aimed at the defence industry. There are also some interesting sources available through the INTERNET, but that could be the subject of another speech. The World Wide Web pages could perhaps be used to advertise our own interests and area of competence, so that if we do not find a Japanese partner or supplier, they will find us instead!

The way of solving information requests at my company corresponds very well with the way my colleagues at most other big Swedish companies work.

You may well ask yourselves the following questions:

– Why do these people simply not ask their Japanese subsidiaries or agents for help to answer requests?
– Why do they not employ Japanese speaking persons in their information services departments?
– Why do they not at least pay a broker to find the information for them?

The answer to these questions are simply:

There is no time. You rather do it yourself. The 'Japanese' requests do not come in often enough to have a person employed. It is difficult sometimes to formulate a question when you do not know what you are looking for. It is also very difficult to get the 'right' result when you use a broker because the broker does not know your company and your requestor. There may be security considerations. It may be too expensive. These are a few answers but there are undoubtedly more.

So what do I and my colleagues in the other large companies in Sweden really want? We would all very much prefer to have a 'black box' attached to our PC communication software. With that black box we would be able to search Japanese language databases as easily as English language ones. Then online searching in Japanese sources would be an everyday activity, not one that is only undertaken with a lot of thought and bother.

HOW AN INTERNATIONAL CORPORATION USES JAPANESE INFORMATION

Mr. Juhani Uoti, Assistant Vice President
Kemira Agro Oy, Espoo Research Centre
Espoo, Finland

Abstract

A case is presented, how Kemira Agro Oy is collaborating with Japanese companies in the business of crop protection. Three different forms of mutual business interests are described: marketing Japanese crop protection chemicals in Finland, using a Japanese trading company in the development and marketing of Kemira's crop protection products in the Eastern Europe and in China, and developing jointly biological products in Japan and in Finland. Principles and special features of doing business with the Japanese companies are discussed. How the information service of the company research centre uses the Japanese sources of information is also shortly presented.

KEMIRA AGRO OY

Kemira is a major chemical corporation in Finland developing, producing and marketing chemical products for agriculture and industry. Originally a home-market and state-owned company, Kemira grew in the 1980's quickly into an international corporation with more than 10 000 employees and with a turnover of 2.7 billion USD. Presently only half of the employees are in Finland, and the value of the domestic business is only 25 % of the total sales. A partial privatisation was carried out in 1994, and the government share of the company is currently 70 %.

Kemira Agro Oy is one of the major companies within the Kemira Group. Its primary business area is plant nutrition or fertilizers. In this business segment the company is the second biggest in Europe. Group protection fits naturally in the agricultural chemicals, and chemical pesticides have long had a small, but important part in the company's strategy. Biotechnology is a new business area, where Kemira Agro is actively pioneering with biological control agents. Microbiological fungicides controlling diseases in

various crops provide an environmentally sound and new method in crop protection.

INFORMATION SERVICE AT THE COMPANY'S RESEARCH CENTRE USING JAPANESE INFORMATION

Kemira Agro has its own R&D centre of 150 people at Espoo near Helsinki. Besides modern laboratories, greenhouses and pilot plants, it also includes information and patent services. In the worldwide scientific, technical and business databases also Japanese information can be found. At Kemira we use databases such as Chemical Abstracts, Commonwealth Agricultural Bureaux Abstracts, Agris, Predicasts' Overview of Markets and Technology and World Patent Index.

There are also good databases specializing in Japanese information: JAPIO (Japanese patent information), Comline Daily News (new product information) and Teikoku Japanese companies (company information). Subscribing the weekly periodical Japan Chemical Week keeps us abreast of what is happening in the Japanese chemical industry. The publishers of this periodical also bring out two comprehensive directories: Japan Chemical Directory and Specialty Chemical Handbook.

For our special needs we have found very useful the services provided by the Translation & Information Service Aho & Meguro. With their help we can get information from special Japanese databases translated in Finnish or English very quickly.

MARKETING JAPANESE CROP PROTECTION CHEMICALS IN FINLAND

As the producers of chemical pesticides the Japanese chemical industry has emerged as one of the industry leaders worldwide. Once known only as formulators enhancing compounds discovered elsewhere, the Japanese are now challenging companies in Europe and the U.S.A. with their own highly productive R&D. The last decade has finally proven that the Japanese companies are seriously committed to new chemistry and to the whole

world as their market. Several new products are launched every year from Japan to compete with the chemical pesticides developed by the major traditional "western" companies such as Ciba, Bayer, Monsanto, DuPont and Cyanamid.

Just like the Japanese car industry used Scandinavia as its testing ground in the 1960's with Datsun Bluebirds and Toyota Crowns many chemical manufacturers started selling their first export pesticides in Finland.

Kemira was developing and acting as the main distributor of the Japanese herbicides, insecticides and fungicides to the Finnish farmers already 25 years ago. The registration and technical support is an important part in the business of farm chemicals. Often harsh conditions in the Finnish farms did not scare the patient Japanese, and the products were flexibly modified when needed. Already years ago the Japanese trading companies solved the geographical problem by establishing local offices either in Stockholm or in Helsinki. Delegations from Japan could not visit us very often due to the long distance, but when they did, those visits were always well planned and prepared. In the beginning most Japanese manufacturers were using trading companies like Sumitomo Corporation, Mitsubishi, Mitsui etc. to handle several European countries in a package. Presently the trend seems to be that more and more companies try to deal with the local distributors directly.

The pesticide business in Finland is modest due to our northern climate - pests are often killed by the severe winter conditions. Today also the EU membership limits the use of farm chemicals leading to lower productivity of our agriculture. The total annual sales have long remained at the level of 250 million FIM, which is less than 0.25 % of the world pesticide business valued around 30 billion USD. Therefore it is clear that in the future, when no more testing is necessary, the interest of Japanese companies in this business in Finland will decrease.

USING A TRADING COMPANY IN THE DEVELOPMENT AND MARKETING OF KEMIRA'S CROP PROTECTION PRODUCTS IN THE EASTERN EUROPE AND CHINA

Kemira Agro has a pesticide production plant in Kokkola, Finland. This modern, multipurpose plant was completed in l986. The idea was to produce and market selected generic pesticides primarily for the Soviet Union. Some of these products had interesting market potential also elsewhere. Sugarbeet herbicides are the products, in which Kemira Agro has special expertise. Now this major market, the Soviet Union does not exist any more as a single country. The situation has caused some changes in the marketing strategy, and other markets have become more important.

Since Kemira Agro is not a major player in the pesticide business, we did not have any established distributor network for these products. The long relationship with Sumitomo Corporation, one of the major "sogo shosha" or trading company in Japan, was a natural choice as our representative in certain former eastern bloc countries and People's Republic of China. Sumitomo had established an efficient office network in Balkan countries and Poland already in the late 1970’s. Unfortunately the war in Yugoslavia has momentarily ceased all activities in that country. In Poland the Sumitomo organization has successfully entered the market with Kemira's sugarbeet herbicides. The Chinese market was a more difficult challenge. Sumitomo had been active there since early 1980’s with several chemical pesticides of Japanese origin. In its Beijing office the company had a staff of Japanese experts with at least elementary knowledge of the Chinese languages. The long process of registering and testing Kemira's herbicides in the Chinese sugar beet fields was finally completed in 1989. Another problem is, however that due to poor economic situation the Chinese farmers have not been able to purchase the product.

DEVELOPING JOINTLY BIOLOGICAL PRODUCTS IN JAPAN AND IN FINLAND

Due to the several drawbacks of the chemical pesticides (toxicity, residues, harmful side-effects in nature, resistance) alternative crop protection

methods have been searched. Biological control using the beneficial organisms of the nature has already shown real possibilities in the practical farming. Kemira Agro is one of the leading companies in the field of microbiological fungicides. On the other hand, Japan has not been very active in this new area. Only recently some Japanese companies have emerged as serious developers of these future products. The companies like Tomen and Idemitsu should be mentioned in this connection.

Kemira Agro recently initiated a concrete joint venture with two Japanese companies in the area of developing biological products. Snow Brand Seed Company Ltd, a subsidiary of Snow Brand located in Sapporo launched in Japan a few years ago a product called Snow Grow Ace. It is an interesting natural growth enchancer, based on an edible mushroom, shiitake. The original producer, Amino Up is a small, but high-tech fermentation company located also in Sapporo. Kemira is now developing their product in Finland, and if feasible, later also elsewhere in Europe. In return Snow Brand Seed and Amino Up are developing Kemira's new biofungicides for the Japanese market.

The three-way cooperation was very quickly created and it seems to be working unusually well. One reason for this initial success may be the fact that the mentality of people in Hokkaido is not so different from the Finnish people. Certainly no less important has been the existence of a local consultant in Finland. Mishima Trading company in Kuopio, established and run by Mr Mishima, has been the key element in this operation. The fact that he speaks fluent Finnish and English certainly helps in the communication. Additionally he is native to Hokkaido, which may have cleared any possible remaining cultural obstacles.

DISCUSSION

The collaboration with several Japanese companies has been an interesting and highly useful experience. Their serious attitude towards work and their perseverance in all conditions and situations has tought us a lesson. One could list many positive properties of the typical Japanese businessman, which one only rarely encounters in his own countrymen or himself: the never-ending politeness, efficient change of information and rapid

communications, warm friendliness and hospitality, when visiting Japan. In the actual business it is of utmost importance to build on a long-lasting relationship. The Japanese culture is a story of its own, which may seem exotic and difficult to understand. Still, we should try to understand it, because it has a lot to give to the hard businessmen of the modern era. The Japanese may be willing to do business with us whether we value their culture or not. The better business opportunity is still for those who care to study it more deeply.

JAPANESE INFORMATION PROFESSIONALS AND INTERNATIONAL PROFESSIONAL NETWORK

Mr. Yukio Nakamura, Autorized Consulting Engineer, former President INFOSTA
Tokyo, Japan

Abstract

The author presents a general way of thinking by Japanese in the past and gives some clarification for the contact with Japanese counterparts and for the sense of equality among Japanese vs qualification and concludes with some suggestions for those who whish to keep abreast of Japanese development.

In considering the problem of linking Japanese information professionals with international professional network, we must begin with some characteristics of JAPANESE as a whole.

Japanese has been rather indifferent to the needs by Western information professionals. This comes from

1. their experiences in the past, that information is usually sought and treated by the information users themselves, so there is nothing to do with Japanese.

2. their geographical situation aparted from other civilized people in the West and unfamiliar with Westerners. They believed in the past that

3. Westerners have interest only in Japanese goods and products and not in information produced in Japan and, also, they never expected that

4. many Westerners meet to talk about Japanese information. Now situations are changing but many Japanese still preserve some residue of old way of thinking. In these circumstances, my talk aims at the improvement in the two-way communication between the West and Japan.

CONTACT WITH JAPANESE FUTURE COUNTERPARTS

One of the shortcomings of Japanese is that they are relatively slow or hesitate in reacting to a letter or inquiry made by unknown Westerners. So, you may think, in general, Japanese are not good communicators.

This is perhaps due to the fact

– that they are not good writers of English or any Western language, and
– that they are not accustomed to writing letters with refusing expressions.

This last fact may sound strange for Westerners but it comes from their way of thinking to be polite, as far as possible, and not giving disagreeable feeling to their counterpart in writing a letter including refusal expressions. For this reason, they wish to receive only letters to which they can respond with amiability. This somewhat controversial way of thinking necessitates, even among Japanese, preliminary actions before receiving or sending a letter. For them a letter is always a "formal" ritual at the end of long discussions and dealing processes between both sides.

To do some preliminary action to a Japanese individual or organization, is often called a "nemawasi", and it is always better to utilize an intermediary. If you know someone who is known by both sides, you can ask this person or organization to introduce you to the Japanese "target", or just to tell this target that you are wishing something. With these introduction or preliminary notice, your future Japanese counterpart is ready to consider matters. For them, such state of readiness is quite necessary to start a communication or deal. With this readiness, Japanese can start.

By the way, such preliminary action through some intermediary is called, in Japanese, "kone", an abbreviation of the word connection. One more notice, this kind of preliminary action through an intermediary does not guarantee your success, it is merely for a successful beginning.

If you are at a lost in finding out an intermediary, then an official organization, such as your Commercial attache in Japan or Japanese

JETRO, or a consultant or a broker in your region may be enough. A professional information broker with a fair knowledge of Japanese or even information specialists equipped with machine translation facility of Japanese texts in specific fields can provide you with worthy service for you. Their number is not so large but they exist in Europe and even in Nordic countries.

I myself am requested often, by our foreign friends, especially in academic circles or from professional men, that Mr. A of his country is wishing to take contact with such and such Japanese individual or organization, then I relay this wish to that Japanese target directly, or through my appropriate friends. This kind of "nemawasi" is not troublesome work for a Japanese. It may take small time for him but he thinks it is a kind of lubricator or mutual help in a complex social relations.

EQUALITY AND COMPETENCE AMONG JAPANESE

Japanese like some kind of qualification or a certificate. If an employer thinks that one of his employees is excellent to be treated favourably, he must find out a reason to persuade other employees for this action. Since Japanese is very much fond of being treated equally in every respect, they wish to be treated equally to their colleagues in a working environment. However, if there is a difference in qualification between two persons, Japanese think it is reasonable to treat one of them with difference. They apt to respect qualification rather than the result one accomplished.

If there is a rule or a social institution that causes difference in treatment (such as salary or some kind of benefits), then everyone agrees to this difference caused. This is a very common feature in Japanese society.

COMPETENCE IN ONLINE RETRIEVAL

When online information retrieval became available in Japanese language and consequently, every organization adopted that system for their own use, the heads of Japanese company or organization at large, had a difficulty. This new job required some special skill and competence in

manipulating terminal equipments and understanding the structure of databases, often in foreign languages.

Computer specialists are treated differently from other employees but this search work does not belong to computer divisions, but to an information division. To recruit and train necessary workers for this new work, Japanese bosses in information division had a difficulty in encouraging their personnels.

INFOSTA is a nationwide organization to promote information activity in general and, at that time, online retrieval was one of the main activities to be promoted. INFOSTA worked actually for this technology but soon it was pointed out by its members that there is a necessity to have a socially-recognized qualification for this new job to encourage people to enter this field.

Beside there was a necessity to train people for different databases of different database suppliers or vendors. Training given by each vendor was not sufficient for these requirements. It was found that some training independent of vendors to be created. This was done by INFOSTA successfully and the next problem was how to encourage those working in such activities. It was necessary to find out some difference in the qualification of those working there.

So it was argued necessary to have a qualification system for these searchers to show that their work belongs to a well-defined special vocation. INFOSTA studied this problem and initiated an examination for recognizing qualified onlinesearchers. The qualification consisted of two classes, second and first. The second class is defined as those having enough search competence and fair knowledge in databases in a specific field such as chemistry, medicine, mechanical engineering and patent works, and at the same time, a fair general understanding in the documentation activity as a whole.

The first grade is for those who guide second class searchers in operating a searcher group and serve for their own company or organization as a

responsible head. For them a higher knowledge in database construction and operation is required and a competence in managerial work.

This institution was organized by INFOSTA itself but from 1989 the system was recognized by the Science and Technology Agency of the Government. Then, the authority of this scheme became firm in Japan. The examination is held once a year and those passed successfully this examination number about 2,400 actually as shown in the Table 1 below.

Table l. Number of qualified searchers.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Grade 2										
Number of applicants	223	219	490	560	816	1050	1055	835	694	
Successful candidates	140	125	224	241	301	354	460	302	232	
Male	77	72	113	115	126	171	209	137	101	
Female	63	53	111	126	175	183	251	165	131	
Grade 1										
Number of applicants	-	90	79	80	104	120	126	181	152	
Successful candidates	-	19	18	19	20	24	24	23	19	
Male		15	6	11	11	16	13	13	9	
Female		4	12	8	9	8	11	10	10	
Examination for general knowledge in info retrieval										
Number of applicants									342	
Successful candidates									302	
Male									66	
Female									236	

Thus onlinesearchers are acknowledged socially and there is a full encouragement for them to pursue their works. The examination is, they say, a little difficult for people just off a university with some education in documentation, so an additional examination was devised in 1993. The new one is named the Examination for General Knowledge in Information Retrieval and it proves that those successful in this examination are suitable, especially for a female, to begin a career in information retrieval works.

This brief description shows just that a qualified status has an important role in initiating a new field in Japanese society.

KEEPING ABREAST OF NEW DEVELOPMENTS

Our Western friends will wish to keep themselves abreast of new developments in Japan. Japan is geographically a narrow land and there is good communication between Japanese mainly by personal contact or through meetings of different nature. So many findings and results are conveyed to fellow specialists not by written documents but orally.

Even between private organizations which are keen in keeping their secrecy, news and rumors spread rapidly. So many of American and European enterprises have their own branch and offices in Japan. Some of them are operating laboratories but in most cases information gathering is also made. This is quite natural. I do not know their results obtained. I expect many more foreign enterprises will follow the same direction.

In these cases, many European executives think that employment cost in Japan is very costly. This is true but there is another point that there is ample supply of manpower for information work at part-time basis and at a very low cost. Japanese enjoy actually longevity but after an age of 55 to 60, most of them must leave companies. They receive full pension from 65 and before that some reduced ones. De facto retirement age is earlier compared to that in Western Europe. So these people, called "silver-aged power", form a market of trained and experienced manpower in many specialities who wish to work half time beside their pension. This is legally acceptable unless they get very high income. The only difficulty is that they speak only poor foreign languages. But this can be overcome, if you have a few of well-trained foreign language speakers of Japanese origin among younger generation.

In this way, information gathering in Japan can be made with Japanese knowhow. For the same kind of activities outside-Japan environment, we can point out the use of existing organizations specialized in information (mostly with commercial enterprise nature) which are spinned off from main Japanese industrial companies. Or you can organize a group of supporting Japanese silver powers with contract.

Here, a few words on the translation problem may be necessary. I wish to point out two points.

1) Technical translation can be better made by specialized translators in the field you concern. If such translators are not available, a team of a good translator in target language and a specialist in that field without a knowledge in the target language can replace a specialized translator.

2) A translation machine with a good machine dictionary specialized in the desired field can work out a passable translation with a post-editing activity.

If a list of translators is not available, my advice is to contact Japan Translation Federation which is mainly working in industrial and technical translation and also making yearly examination for quality translators.

If you are looking for libraries holding Japanese books and documents you can contact with "European Association of Japanese Resource Specialists (EAJRS)".

All in all, the contact between information specialists of both sides, Europe and Japan, has already started but, in my impression, it is still to be improved in all respects.

Changing mind is necessary in a changing world. You are now thinking of Japan but there are other followers. In the Eastern Asia there are so-called four small dragons and still others. In the next century all people must pay attention to these emerging countries. Japan information problem will be, in a future, Asian information problem. You and we all must prepare for this situation, either cooperating or competing with them - perhaps both.

ADDRESSES

INFOSTA (Information Science and Technology Association)
5-7, Koisikawa-2, Bunkyo-ku,Tokyo, Postal Code 112, Japan
Tel. +81.3.3813.3791, Fax +81.3.3813.3793

Japan Translation Federation,
8-1, Hatchobori-2, Chuo-ku, Tokyo, Postal Code 104, Japan
Tel. +81.3.3555.2905, Fax +81.3.3552.1784

European Association of Japanese Resource Specialists(EAJRS)
Jane Irisa, Secretary EAJRS, British Council,
9-11 rue de Constantine, 75007 Paris, France. Tel. (1)4705.3797

JOIS DATABANK AND OTHER SERVICES OF JICST

Ms. Yukiko Sone, General Manager
Overseas Service Division, JICST
Tokyo, Japan

1 JICST AND JAPANESE STI

The Japan Information Center of Science and Technology (JICST) is a semi-governmental organization established in Aug. 1957.

As a central information organization in Japan, JICST has been given the responsibility of collecting STI on a worldwide scale, processing this information systematically, disseminating the information rapidly and appropriately to users and cooperating with similar type organizations throughout the world.

JICST's collection is one of the world's most comprehensive in the field of science and technology, especially for literature published in Japan.JICST's annual collection includes some 8,300 domestic serial titles and about 8,900 serial titles from over 50 nations. 1,000 conference proceedings and preprints, 12,500 technical reports and 5,000 research reports published by government agencies are also added to the collection annually.

JICST has been making its best effort to collect information of Japanese origin in response to the great demand by overseas countries. Now, of all the source materials collected by JICST in 1995, the proportion of Japanese source materials is about the half. Thus, JICST has put special emphasis on Japanese STI.

2 JICST'S TWO ONLINE SYSTEMS, JOIS AND STN

JICST is also charged with disseminating S &T information overseas as well as in Japan. JICST is presently operating two online systems: JOIS and STN.

Almost 10 years have passed since it started providing JOIS to overseas users in response to the strong request for Japanese STI in 1985. JOIS is an online information system originally developed by JICST and mainly used by Japanese users. Seven bibliographic databases including one English-language database are accessible from overseas and most of them are designed to be searched in Japanese. However, English commands and system messages are available for non-Japanese-language users.

To access JOIS, one must become a registered user of JOIS as well as the network connection provider, like BT (formerly TYMNET), etc. Official agents for JOIS in Europe can help you get passwords to use JOIS and learn how to use the system.

STN (Scientific and Technical Information Network) International is an online system which is operated jointly by JICST, the Chemical Abstracts Service and FIZ Karlsruhe. STN provides users with 180 world-class databases, containing bibliographic, structure, full-text, numeric files. and patent information. JICST is not only a service center of STN but also sponsors of JICST databases in STN. To promote the use of JICST databases in STN, VTT in Finland and IDC-KTHB in Sweden will soon work as an agent for JICST databases in STN to support Nordic users.

3 DATABASES AVAILABLE ON JOIS

Some features of databases on JOIS are as follows.

- JICST File on Science and Technology (JICST File)
  JICST File on Science and Technology is the major database on JOIS. It contains some 9,680,000 citations in all the fields of science and technology originating from more than 50 countries in the world since 1975. Annual addition is about 700,000 citations and is updated twice a month. A typical search plan using JOIS would probably include searching the JICST file. If you have some reading skill Japanese, it is the fastest way to search JICST file to get Japanese STI.

- JQUICK File

  The citations contained in this file will ultimately become part of the JICST file, but are gathered here in abbreviated form (titles and bibliographic data only; without any key words) to provide more rapid access to recently received documents. So the benefit derived from this file is gained for citations dating back about six months from the searching date. Many citations in the JQUICK file include English titles and some citations also include English abstracts written by the author.It is updated twice a month with 900,000 being added annually.

- JMEDICINE File (JMED)

  JMED is a database covering medical information published in Japan, made up by merging two databases by JICST and Japan Medical Abstracts Society (JAMAS) into one. They are some portions of the JICST File which are related to biomedical and life sciences and JAMAS database, which corresponds to the abstract journal (IGAKU CHOU ZASSHI), the oldest abstracts journal in Japan. (First published in 1903.)

  Conference papers take up a large share of the JAMAS database portion of JMED. Thus, JMED can be regarded as the most comprehensive database on medical information in Japan. Data goes back to 1981 and is updated monthly.

- MK-MEDIA File

  NK-MEDIA is a database produced by Daily Industrial News, Ltd. Using articles in its newspaper as the source, the database contains information on new products and technologies, movements in the industrial circle and venture businesses. It is particularly useful for tracking the current technical progress in Japan. Annual input is about 32,000 and is updated weekly.

- JICST-E (The JICST File on Science, Technology and Medicine in Japan)

  It is not easy for overseas users carrying out search using Japanese terms and understand the abstracts retrieved in Japanese. To promote better use of Japanese STI throughout the world, JICST has compiled two English-language databases, JICST-E and JGRIP.

JICST-E is an English-language subset of the Japanese-language JICST File, which is devoted exclusively to citations published in Japan. JICST-E includes 2 million translations of citations from JICST File. This file was started back in 1985. However, abstracts are not provided for all citations. Recently, JICST has steadily increased the amount of citations with abstracts. It now stands at about 57 %.

To reduce the time and cost for producing an English database, The JICST Machine Translation System has been utilized for translate Japanese titles and abstracts when original papers do not include English titles or abstracts. In 1994, 240,000 citations were added to the JICST-E file. Titles for 92,000 of these items, or about 38 %, were produced using the MT system. Of the 136,000 items with abstracts, 38,000, or about 28 %, were translated using the MT system.

JICST MT system has been further enhanced by extending it from mainframe to workstations and PC versions, allowing carrying out of translations on a distributed basis, and this will be led to increase the number of titles and abstracts translated into English within a certain period.

4 DATABASES AVAILABLE ON STN

Some of the features of databases on STN are as follows.

- JICST-Eplus
  JICST-E file available though STN has just been modified from May 1 and now has become JICST-Eplus.

  JICST-Eplus is compiled by merging "preview" file and the JICST-E file. There are approximately 2,000 new records per update (all initially unindexed) that will appear about 4 months earlier than if they had been indexed. The new records include 413 conference proceedings not previously included in JICST-E. Articles for which JICST has permission to use English titles and abstracts are input directly into the file.

- JGRIP

  The JGRIP file is also available on STN. The JGRIP contains English citations covering current ongoing research and research completed by public research organizations in Japan. This file is reloaded annually based on the results of an annual survey sent to 720 public research organizations. The records include titles, staff, performing organizations, years of activity, Geographic terms, funding levels, and brief abstracts.

5 JICST-E CD-ROM

JICST-E File will also be available on CD-ROM. Currently, the CD-ROM is in its developmental stage and it will be released within this year. This disc will be produced and updated by JICST and will contain about 240,000 records annually accumulated.

One of the aims in making a CD-ROM, besides online service, is to help users easily identify information without worrying about time and cost. The software used to search the CD-ROM is CD Answer, which is licensed by Dataware Technologies Inc. and it runs under Dos, Windows and Macintosh. It is extremely easy to use, with a search menu with 14 search fields. To execute a search, users can enter a valid search request into a search field or fields in the menu. Boolean operators are available. Search request text can be saved for use next time. It allows users to easily keep up with the subject whenever the data newly updated.

We hope the CD-ROM will appeal not just to academic libraries but also to those of corporate sectors as well. I believe that this would be more useful to learn the recent trends on Japanese S&T rather than to get the most up-to-date information, which may be obtained by JICST-E online access.

6 FUTURE SERVICES OF JICST

Thus, JICST has been or will be providing its customers worldwide with various ways to access Japanese STI. Furthermore, this year we have a plan to launch a machine translation service via Internet and access to JOIS via Interenet. With at least 30 million people already on Internet, a growing

number of information providers have already started taking advantage of Internet not only to advertise their own services but also to provide Internet access to their databases.

JICST's Web site has already initiated the "GIHO FILE" on a free basis which contains titles of articles drawn from 337 Japanese technical journals or reports published by Japanese companies. However, Internet access to JOIS databases will be welcomed by the users who feel traditional access routes to Japan are too highly priced. To help the user who can not understand an article in Japanese, a translation into English will be carried out utilizing the JICST Machine Translation System and immediately be sent back to the end-user via Internet.

JICST will make every effort to improve and diversity its information services, taking the customer's needs into consideration.

Your ideas and comments will be greatly appreciated.

NETWORK OF NIKKEI TELECOM

Mr. Akira Higurashi, General Manager
Databank, Nikkei Europe Inc.
London, England

NIHON KEIZAI SHIMBUN

Nihon Keizai Shimbun Inc, or Nikkei, is one of the largest business information networks in the world. Nikkei was originally established in 1876 as a daily financial newspaper. The company grew steadily and now, more than 100 years later, Nikkei is a large group of over 70 companies, employing over 11,000 of people around the world.

Nikkei aims to be a leading total information system, disseminating news and data through a variety of media. In addition to five business newspapers, we also publish some 50 regular magazines and newsletters. Subsidiary companies of the Nikkei group are responsible for book publishing, television channels, radio stations, advertising, market research, public relations and many other media related activities.

The information available is continuously increasing, so it is important to select genuinely necessary information for our information system. We should get correct, timely and quality information only.

Nikkei has been satisfying these requirements for information so far and will continue to satisfy them from now on.

THE LARGEST FINANCIAL DAILY IN THE WORLD

Of course, the main focus of Nikkei's business is still our daily newspaper the **Nihon Keizai Shimbun**, or **Nikkei,** which means 'Japan Economic Newspaper'. The Nikkei has a circulation of 3 million and is the largest economic newspaper in the world. It is read by almost all senior managers

and directors in Japan and is highly respected for its fast, accurate and objective reporting. Many of Nikkei's reporters are trained economists and their commentary on the Japanese markets and economy is read closely by Japan's top decision makers in industry and finance.

With 2,000 journalists based in news bureau around the world, Nikkei is able to gather news 24 hours a day. As news articles are being written, they are transmitted electronically to teams of translators in Tokyo and New York, who work around the clock to provide real-time news in English.

Nikkei is also famous as the producer of the Nikkei Stock Average, the most popular index which represents the movement of the Tokyo Stock Exchange. Nikkei calculates the index using the stock prices of 225 major companies. Investors follow the value of the index closely, as it not only indicates the strength of the stock market, but also forms the underlying price of Nikkei Stock Average futures and options trading.

DATABANK BUSINESS

In 1967 Nikkei formed a new department, the Databank Bureau, whose purpose was to create a databank of economic information. The databank would provide essential business related data through the medium of the computer; data to support Japan's top managers in decisions on financing, marketing, strategy and investment. The result was 'NEEDS', the 'Nikkei Economic Electronic Databank System', a vast collection of articles and numerical data.

Since then, NEEDS has grown to be the largest and most famous economic databank in Japan, containing over 5 million series of data. Used by all major manufacturing and financial companies in Japan as well as by government departments and universities, it is now the foremost information source for business.

NEEDS contains a wide variety of data, from news articles to numerical data such as stock prices and economic statistics. Although the databank is designed to be a single source for all business information needs, in fact it is

so large that most users only need access to some of the databases. To cater for our many users' various requirements, Nikkei's Databank Bureau has developed a range of products to access NEEDS.

NEEDS-MT

NEEDS-MT provides historical numerical data on magnetic tapes. Subscribers to this service use the tapes to load data to their own mainframe or workstation and create an inhouse database. The historical data are useful for time series analysis of stock prices or economic statistics. Many subscribers use NEEDS-MT to get companies' past balance sheets and income statements.

NEEDS-BULK

NEEDS-BULK is a computer-to-computer transmission service, providing daily feeds to update the subscriber's in-house database system. Feeds are usually files of price data, or other daily information and are sent automatically at a regular time each day, rather than being retrieved by commands. NEEDS-BULK uses a leased line between our London computer centre and the subscriber's mainframe computer and the data are transmitted at 9.6 kilobytes per second.

NEEDS-TS

This is an interactive online service, using a PC and modem to dial up to our computer centre. Once the subscriber is connected online he can use the sophisticated NEEDS-TS software to manipulate and analyse the data.

NEEDS-TS has two main products as follows.

NEEDS-COMPANY

You can make detailed company analysis, research for investment and evaluation of your portfolio performance. For example, you can select the companies which meet your own criteria for investment such as PER (Price Earning Ratio) less than 20 and ROE (Return on Equity) more than 5 %, etc. For those companies, you can then research in depth using the detailed financial reports.

The database covers prices of stock, bond and market indices and financial reports for each company. Stock prices include all of the companies listed on Japanese stock exchanges and OTC-registered, about 2,800 companies. Up to 20 years of historical data are allowing you to analyse trends in prices. Financial futures and options markets are also covered.

Closing prices in Japan are updated in the morning in Europe and you can access them and work in the day while analysts in Japan are sleeping.

Financial reports include the full balance sheet and profit & loss accounts of all listed, OTC-registered and other major companies, about 7,000 companies. The financial data are updated much earlier than official security reports. The flash report is updated on the day following the company's anouncement at the exchange and the complete figures are updated 3 months after the company's fiscal year end.

NEEDS-ECONOMY

This product is used by almost all of the large financial institutions and research institutions, including universities in Japan. It provides all main economic statistics and a macro economic model of Japan. If you input your own prediction for official discount rate, the model calculates how your figure will affect growth of GDP and private capital investment, for example. The database covers about 12,000 series including national accounts, prices, products, balance of trade and so on. It also provides about 2,000 daily data series for interest rates and exchange rates around the world.

These data are updated as soon as we get them.

NIKKEI TELECOM

This product is Nikkei's best seller, with about 20,000 subscribers at present. The service is particularly popular in Japan, where it is used in almost all major companies and government departments.

Nikkei Telecom is an online service, offering a package of data from the NEEDS databank. With NEEDS-MT, NEEDS-BULK and NEEDS-TS the subscriber chooses part of the databank, such as stock prices for example, and subscribes to that part alone. With Nikkei Telecom, however, the subscriber can access many different parts of the databank and pay for the amount of data used each month.

There are several different versions of Nikkei Telecom; some are in English and some are in Japanese. The most widely used are **Japan News & Retrieval** (in English) and **News Telecom** and **Sogoban** (in Japanese).

The subscriber sees a menu of data available and chooses the data required. A few commands are necessary, but basically Nikkei Telecom is 'menu-driven', which makes it easy to use even for subscribers who are unfamiliar with online information services.

JAPAN NEWS & RETRIEVAL

This service offers a menu of varied information, which can be broadly separated into five categories:

1) News
2) Historical newspaper articles
3) Stock, bond and other financial market prices
4) Company information
5) Economic statistics

1) News

Japan News & Retrieval offers the latest articles from the newspapers, as well as real-time news feeds.

Newspapers

News articles from Nikkei's daily newspaper, the **Nihon Keizai Shimbun**, are actually available in English on Nikkei Telecom Japan News & Retrieval the day before the paper itself is printed. As the articles are being written by Nikkei reporters around the world, they are stored in our computer and translated immediately, then updated on Japan News & Retrieval. This means that if you access the service at lunchtime in Europe, it is evening in Japan and most of the articles for the following day's newspaper have already been written, translated and input to the database.

A brief scan of the headlines enables you to keep a step ahead of the competition.

Real-time News

There are four real-time news feeds:

1) Nikkei News Bulletin
2) Knight-Ridder News
3) AFX News
4) VWD News

These are useful especially for dealers in stockbroking companies, who need up-to-the-minute news of events which may affect the markets.

2) Historical News Articles

Japan News & Retrieval stores 10 years of newspaper articles translated to English from the Japanese and Asian press. The database currently contains more than a million articles from some 30 newspapers and newsletters.

Retrieval software allows you to search the database for articles containing any keyword you specify. Your search can be broadened or narrowed by adding more words or phrases, by truncating words or by specifying a time period or a particular publication. When you wish to view the articles

retrieved by the search you can choose to see either the headlines or the full text.

This facility is particularly useful for staying on top of competitor developments. Simply type in the company name of your competitor in Japan to get any news of their recent activities that has been reported in the press. This saves hours of scanning the newspapers for a mention of the company and also overcomes the language problem, as all the news has already been translated into English.

Similarly, to get information on particular products, you need only input the name of the product for instant access to the latest developments.

3) Stock, Bond and other Financial Market Prices

Japan News & Retrieval provides daily updates of price data for all major financial products listed on the Japanese markets.

4) Company Information

Nikkei Corporate Profiles

One of the highlights of Japan News & Retrieval is the company information. The detailed Nikkei corporate profiles cover about 2,000 Japanese companies and contain a wealth of information from basic details such as address to valuable and otherwise inaccessible data such as major shareholders. Sections of the company's annual report are also included, providing a useful commentary on the past year's performance and activities.

Teikoku Databank

The **Teikoku Databank** menu on Japan News & Retrieval provides profiles of 180,000 Japanese companies, most of which are private.

It is possible to select an individual company by name, or to retrieve data on a group of companies which match certain criteria such as industrial sector.

Asian Corporate Profiles

Brief profiles are provided for 18,000 Asian companies in the following countries:

China	Korea
Hong Kong	Taiwan
Singapore	Malaysia
Thailand	Indonesia
Philippines	

These cover 3 years of data, and companies can be screened by industrial sector.

5) Economic Statistics

Japan News & Retrieval offers over 10,000 series of macro-economic statistics, along with forecasts for the Japanese economy.

ACCESS

To access NEEDS-TS or Japan News & Retrieval you need a PC with asynchronous communications software and a modem. Access is by dial-up to our computer centre in London, using the public telephone network or a packet-switched data network such as Datapak.

All the data can be printed and downloaded.

NEWS TELECOM AND SOGOBAN

These are the two most popular Japanese language versions of the Nikkei Telecom service.

News Telecom has been our bestseller in Japan, although in Europe the language problem makes it less popular than Japan News & Retrieval.
It contains news from much more Japanese newspapers than the English version, including regional newspapers and magazines. Coverage of company data is also broader, with short profiles of nearly a million companies.

Sogoban offers a small selection of news, with a large amount of numerical data covering stock and bond market prices and economic statistics.

JAPAN-RELATED INFORMATION ON THE INTERNET

Mr. Thierry Consigny, Manager, Head of Information Service
EU-Japan Centre for Industrial Cooperation
Tokyo, Japan

Readily available information on the Internet about Japan is not hard to find, especially if you are on the World Wide Web (WWW, or the Web). However, sifting through the available data to find useful information, while enjoyable, can be very time-consuming. This article gives some basic information about the three most important ways of gathering information about Japan on the Internet and suggests some sites from from which you can start your exploration. This information is not meant as a tutorial, but is aimed at illustrating the possibilities to users who want to use the Internet to find information about Japan and its markets, technology, and language.

1 ELECTRONIC MAIL, LISTSERVS, AND NEWSGROUPS

E-mail is the most prevalent form of Internet usage in the world today. E-mail addresses are now considered a necessity on business cards in the Western world and, quickly, the practice is making its way into Japan. (By the time the next edition of this book is out, the Internet will have spread throughout Japanese businesses.) However, to use e-mail for information gathering, you must know an expert or two and have their e-mail addresses. In the old days, businessmen made contacts by personal networking. Today, one can do the equivalent by listservs and newsgroups.

1.1 LISTSERVS

A mail list server (or listserv) is a database of e-mail addresses that essentially maintains itself. E-mail from one user is forwarded to everyone else on the list. To get on the list, you must first subscribe to the database. While the syntax sometimes varies, the most common form is "subscribe

<list name> <your name>". Once subscribed, you get all the mail that is sent to the server and, in many cases, can send your own messages to the server (and so to all the other users). To stop the unceasing flow of e-mail (sometimes 20 or more messages a day for popular topics), you must unsubscribe from the mail list server. The method for unsubscribing is included in the first few messages you receive, so remember to save them.

The mail list server scheme is used for distribution of information including newsletters and discussion groups. Several important ones pertain to Japan:

j-food-l	Japanese food & culture discussion list
japan	Japanese business and economics network
jpinfo-l	Information list about Japan
jtem-l	Japanese via electronic media
nihongo	Japanese language discussion group

To subscribe to these listservs, send an email message to listserv@-brownvm.brown.edu and in the body (not the subject header, which is ignored) include "subscribe <list name> <your name>" (without the quotes; for example: subscribe jtem-l robert lemos).

1.2 NEWSGROUPS

Another text-based distribution method similar to listservs is newsgroups. Newsgroups differ mainly in that they reside on a news server rather than piling up in your mailbox. Having the messages on a central server saves space and bandwidth for both the provider and the user. This method of distribution makes it possible to browse the messages in the subscribed newsgroups, which saves time (theoretically) as well as space.

Newsgroups are an easy way to become addicted to the information flow of the Internet. If you are subscribed to more than 20 newsgroups (and there are thousands of groups out there), the browsing aspect of the groups becomes important – else you will find your productivity plunging. Needless to say, when subscribing to newsgroups, the importance of being selective cannot be overemphasized. The format of a newsgroups descriptor (a.k.a., title) follows protocols set by the USENET group who created the

newsgroup network. For those who have e-mail addresses, the format should look familiar.

For example, there are groups like comp.research.japan (a forum for Japanese research about computers in Japan) and fj.comp.comm (a forum "from Japan" (fj) concerning communications for computers; messages are usually in Japanese). Some important groups for Japan-related information include:

alt.japanese.text	Q&A about Japanese text processing
comp.research.japan	Japanese computer research information
fj.comp.comm	Japan-specific computer communications topics
fj.life.in-japan	Information and discussions about living in Japan
fj.net-people	Discussions about the Internet in Japan
fj.news.lists	Notices about new Japanese lists
sci.lang.japan	Topics on the Japanese language
soc.culture.japan	Usually heated discussions about the Japanese

Unfortunately, few of the "fj" groups are very active; most of the newsgroups worth reading are on the English side of the Internet.

1.3 FTP SOURCES

Most users of the Internet not only want to read all the information that they can find, but also save a copy of important information for later reading or for archiving on their own system where it is easier to access. Considering the cost of connecting within Japan, the ability to easily download information is a much cheaper way to access the information available on the Internet, as it minimizes your time online.

In recent months, there has been a marked increase in the number of anonymous FTP sites offering access to Japan-related material. During the course of researching this article, we found over 100 sites claiming to have Japan-related freeware and shareware software packages, as well as useful news and other information pertaining to computing issues in Japan. The files offered by these sites cover a wide range of material, from text editors

and FEPs to the latest news about collaborative research projects going on between Japanese corporations and American universities. There are wide differences in the amount of material offered from site to site, as well as in the degree of maintenance done to keep the software versions up-to-date. Some of the sites contain nothing more than a couple of files posted several years ago, while others appear to have wiped out their Japan-related files altogether.

To access an FTP site, simply type the command ftp followed by the name of the site. For example, to access Monash University's server, at the % prompt you would simply type:

```
% ftp ftp.monash.edu.au
```

To navigate through the directories of the site and obtain files, you can use the following commands:

cd <directory>	change working directory
cdup	move up one directory level
dir	display contents of working directory
get <file>	copy a file from the ftp host
put <file>	post a file to the ftp host
quit	end the FTP session

Describe below are six of the most useful anonymous FTP sites to browse for Japanese text processing utilities, dictionaries, code-conversion programs, font packages, news, and the like. These sites were chosen based on the amount and variety of material offered, the degree of organization (some sites provide numerous README files and other explanatory documentation, while other sites pretty much leave you on your own), and the level of upkeep (how current is the software and information?). So, if you're interested in browsing around and finding out what's available out there on the net, here are six sites that are highly recommended:

The O'Reilly & Associates, Inc. FTP Archive

Site Name:	ftp.ora.com
IP Address:	140.186.65.25
Director:	/pub/examples/nutshell/ujip

Ken Lunde, the author of *Understanding Japananese Information Processing, has for years kept a huge archive of Japan-related software here, as well as the famous JAPAN.INF document that eventually became the basis for his best-selling book. The JAPAN.INF document has been discontinued, and in its place Lunde has created a new file called CJK.INF, which contains Japan-related information, as well as the tables and figures from UJIP. Users will find the latest versions of dictionaries and Japanese text processing tools for Amiga, Mac, DOS, OS/2, Unix, VMS, and Windows systems, each with its own subdirectory. The FAQ directory also contains several interesting reports about using Japanese on the internet. The sheer volume and high quality of the material found in this archive make this a 'must-see' for anyone interested in Japanese text processing.

Monash University

Site Name:	ftp.monash.edu.au
IP Address:	130.194.11.1
Directory:	/pub/Nihongo

This archive is maintained by Jim Breen, a professor at Monash University in Australia who has been managing the development of the EDICT and KANJIDIC online dictionary projects. The file INDEX contains a well-written synopsis of all of the software and documents available. The selection of educational software for students of Japanese at this site is especially impressive, and includes several kanji flashcard packages, a demo version of Kanji Sensei by Pacific Rim Ltd., and the vocabulary files from Mangajin.

In addition to all of the files for the EDICT/KANJIDIC projects, the source code and executable files for several utilities related to this project can also be found here. These files include esplit, which splits EDICT into two parts, names and non-names, and kdfilt, which strips KANJIDIC of unwanted codes. The site also offers most of the popular text editing software, a nice selection of Japanese font files, the Japanese text of Tale of Genji in one huge EUC file, and a copy of the Japanese constitution in Japanese.

University of Washington Technical Japanese Program

Site Name: ftp.uwtc.washington.edu
IP Address: 128.95.202.40
Directory: /pub/Japanese

The 'Uesama' server for the Technical Japanese Program at the University of Washington contains a wealth of Japan-related software and information that is exceptionally well-organized and well-documented. Every subdirectory under /pub/Japanese has a README file describing its contents, so this site is especially recommended for those who are new to ftp and looking for a good starting point to find Japan-related material. In addition to offering a great selection of IBM-PC, Mac, and Unix software for handling Japanese, there are also interesting articles about US-Japan relations as well as a variety of Japanese-language study aids for beginners, including Kurt Stueber's Kanji of the Day and the kotowaza articles from the sci.lang.japan newsgroup.

University of Tokyo

Site Name: utsun.s.u-tokyo.ac.jp
IP Address: 133.11.11.11
Directory: /fj

This site contains a lot of good Japanese software, much of which is documented in English, as well as the most current Japanese versions of the common text editors in use today. Users will find a great selection of Japanese software here for the Unix environment, as well as many not-so-well known programs for Japanese input.

One of these, Tcode, is a 2-stroke kanji input system that has been attracting a growing number of users. Several other miscellaneous programs can be found here, including svmail1.4, a System-V mailer for JUNET ver 1.4; vtemu, a VT-100 emulator for the PC-98; and zip-doc, a dictionary of zip codes for Japan.

FTP Archives of The Consortium for Lexical Research

Site Name: crl.nmsu.edu
IP Address: 128.123.1.33
Directory: /CLR/multiling/japanese

This site offers one of the best selections of Japanese fonts that can be found on anonymous ftp, located in /CLR/multiling/japanese/fonts. Although not very well organized, users can also find several dictionaries and editors in the CLR/multiling/japanese sub-directory. First get a document called FILES, which gives a brief description of the software and information offered by CLR. Useful information about other Japan-related ftp sites can be found in the document ftp.sites, and individual descriptions of several Japanese-processing utilities can be found in the file software.list.

Tohoku University

Site Name: ftp.tohoku.ac.jp
IP Address: 130.34.8.9
Interesting Directories: /pub

This is a good site for finding up-to-date versions of Japanese software. From /pub, change to the subdirectory for the platform you are interested in, and take a look around. In addition to the Japanese text-processing tools such as Canna, Wnn, and NJStar, a lot of less-familiar software tools can also be found here, especially for Mac and IBM-PC systems. Documentation for some, but not all of this software, is provided in Japanese README files.

2 THE WORLD WIDE WEB

The World Wide Web has grown phenomenally over the past year, in part due to the popularity of the browser interface and in part because of the media frenzy over the power of the Internet. The Web is frequently misrepresented as the Internet itself; in reality, the Web is a protocol that resides on top of the Internet. For users, the benefits of the Web are derived from the browsers and the informational view of the Internet that the Web has made possible. Unlike the Internet of a few years ago, with the Web,

users no longer have to know the address of every piece of data they want to find. Instead of accessing distributed information by ftping to each site, with a Web browser, the user can follow links in the information that may access other sites, but in a way that is nearly transparent.

2.1 WEB BASICS

Publishing and browsing on the Web is done through Web pages. A Web page is a hypertext document, that is, a document that links to other documents by using the hypertext mark-up language (HTML). These hypertext links usually take the form of the ubiquitous underlined text found across the Web, but they can also be attached to graphics or buttons. When faced with a map in the Web, many novice users do not realize that by clicking on different parts of the map, they can be linked to different information sources.

Data transactions on the net are described by a uniform resource locator (an URL, pronounced "an earl"). These URLs not only identify the location of the WWW server site (on the Internet), but are also prefaced by the data transfer protocol. An URL for reading a Web page from the MPT by the WWW's own transfer protocol might be:

http://www.mpt.go.jp/,

while transfering the actual information might use the file transfer protocol (ftp) and be

ftp://www.mpt.go.jp/welcome.txt.

Data travels on the Web using the hypertext transfer protocol (HTTP). A browser using the HTTP essentially sends a single request to a Web site and waits for that site to return a reply.

Additional queries to the site are treated independent of the first. Thus, connecting once to a Web server does not guarantee that additional connection attempts will be successful (important to remember as Web servers get busier). While all the information is transfered to the users site, browsers generally do not allow the user to save the file as a Web page. The user can either save the file as an HTML document (which can then be used to learn the HTML language) or as a text file (for information content). Downloading other data (like graphics or sound files) generally

has to be done by ftp, which must be specifically allowed by the host Web server.

Thus, while HTTP make the Web easy to use, certain safeguards are built in to protect the posted data. For actual data transfer, the Web also supports FTP, Gopher, and newsgroups. After e-mail and the Web's HTTP, file-transfer protocol (FTP) is the most popular and can be done using a Web browser by a simple change to the URL (prefixing the statement with ftp rather than http). The specifics of what is out there are given in the next section.

2.2 ACCESSING JAPANESE PAGES THROUGH THE WEB

The main problem with accessing Japanese Web pages is, of course, many of them are written in Japanese. Aside from this being a problem for users who cannot read Japanese, non-double-byte-enabled browsers will not be able to display the Japanese character set (kanji). Fortunately, most users will find that many Japanese companies support English on their Web pages. However, to get detailed information, the user will need to be able to display and read Japanese. There are four personal computer configurations that can handle Japanese (double-byte) text display (other UNIX and X-Windows configurations also support bilingual solutions): two are purely Japanese solutions, while the other two are more bilingual (Japanese and a second language). First, a Macintosh running KanjiTalk 7 (the Japanese system) and the Netscape browser (which can display in any language) or Fujitsu's licensed version of Mosaic (made specifically for Japanese) can di splay Japanese, as can a DOS/V (Japanese DOS) machine running Japanese Windows and one of the Windows versions of the above browsers. However, these solution require that the user's entire system be run in Japanese, which is usually not a practical solution.

The bilingual solutions consist of using local (English, Dutch, German, whatever) systems with special Japanese programs. For the Mac, running with the Japanese Language Kit gives the user the ability to display and process Japanese. By using either of the two browsers mentioned above (Netscape's Mosaic or Fujitsu's InfoMosaic), any Mac should be able to download and display Japanese files. Similarly, by buying and installing Win/V (a program produced by C.F. Computing that emulates Japanese

Windows on a non-Japanese system) and using either of the two Japanese-capable browsers, Japanese files and Web pages can be read on a DOS-compatible machine.

(The Japanese Language Kit (JLK) can be ordered from your local Apple dealer. Win/V can be obtained with English documentation from Fast River Systems Y.K. in Japan by calling +81-3-3706-7580. The Netscape and Fujitsu InfoMosaic browsers are available via anonymous ftp from various sites or can be bought packaged with several books about the Web and the Internet.)

2.3 JAPAN-RELATED INFORMATION

Getting information using the World Wide Web is an extremely easy, but not always valuable, exercise. People and companies are posting all sorts of information on the Web, but few contain information that is pertinent to businesses who would like to operate in Japan or who want to know more about the Japanese market. Thus, Web pages that contain links to important sources are valuable in their own right.

The easiest way to get information about Japan is to go to the Yahoo Search
Web page at:

http://akebono.stanford.edu/yahoo.

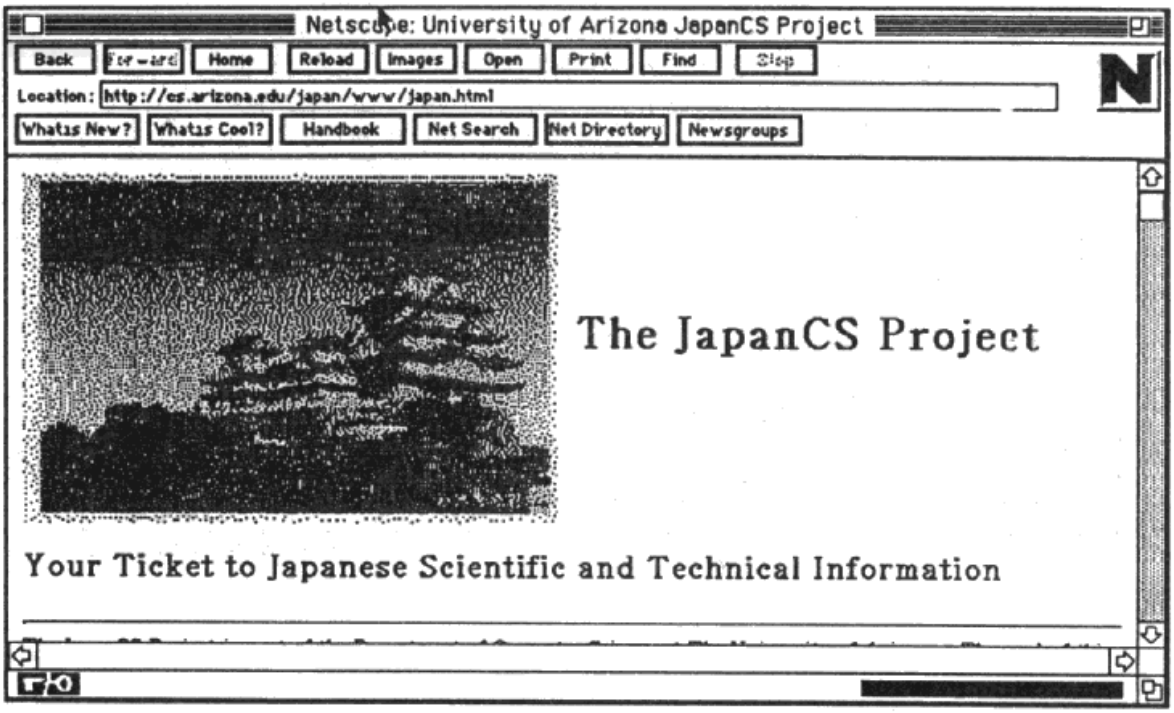
This is a Web page that acts as an interface to a database of Web pages. Here, people can register the Web pages they post, or search through the collection of Web pages (some 2 million pages are registered). Searching under the keyword "japan" turned up 196 entries at the time this article was written. The Yahoo Search page also has links to other engines, which may contain even more entries to Japan-related pages. With these search engines, the newly initiated and the old hand alike will be able to find most any page on the Web. The most useful pages, though, are hard to find, so many users have put up their own Web pages with lists of sites and links directly to those sites. Several pages are this type are listed below to help guide the user in finding the information they need.

2.4 SITES WITH JAPAN LINKS

Japan CS Project

URL: http://cs.arizona.edu/japan/www/japan.html

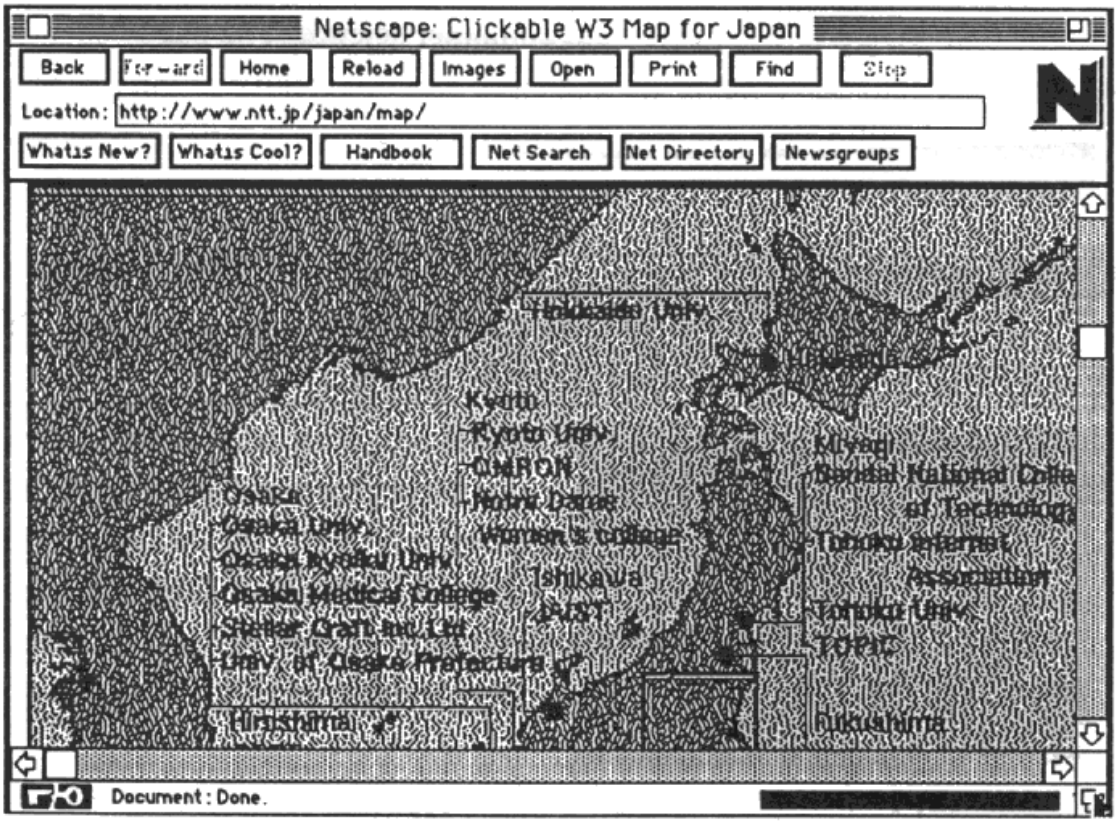
A page maintained by the University of Arizona's Computer Science Dept. aimed at increasing the accessibility of Japanese scientific and technical information related to computing and computer science. The page has a lot of good connections to sites in Japan as well as a full archive of the Kahaner reports on scientific happenings in Japan.



Japan WWW Map

URL: http://www.ntt.jp/japan/map/

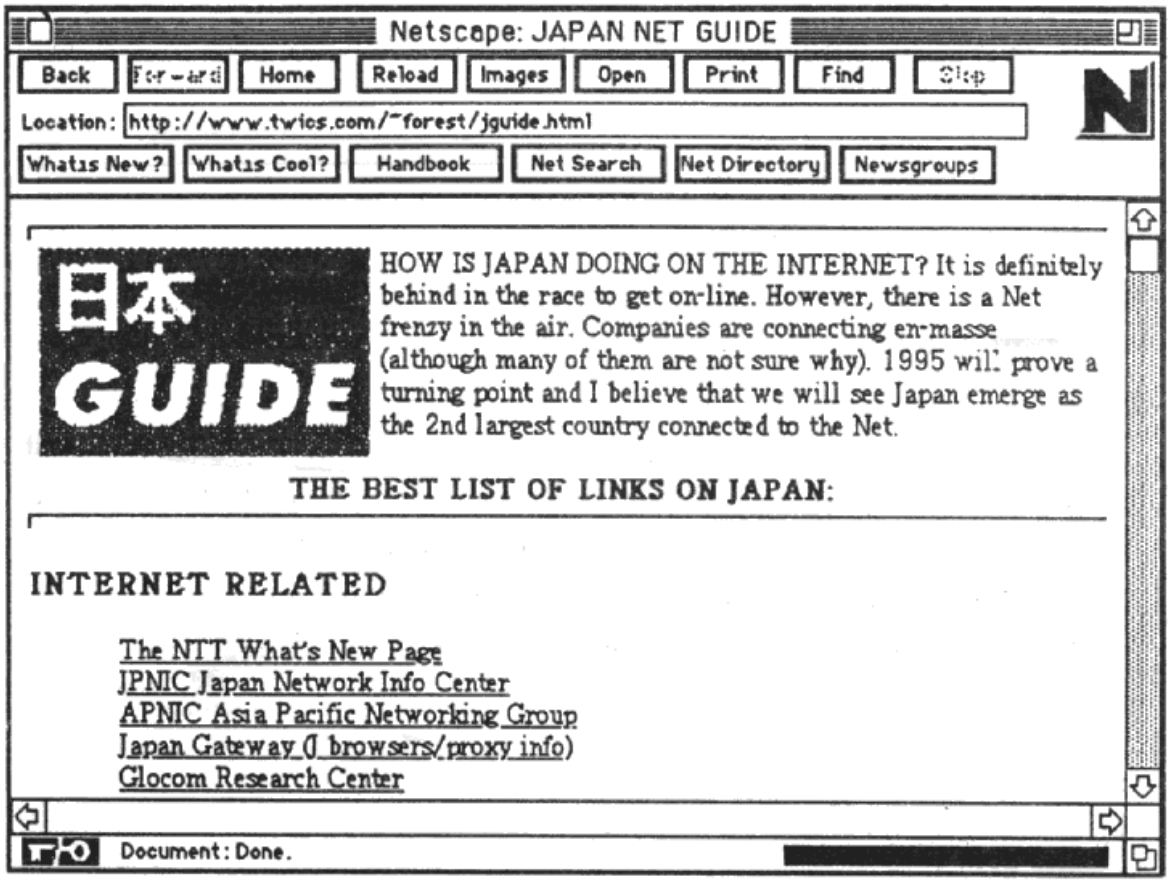
This page has a clickable map of Japan that shows many of the Web sites in the country.



The Forest

URL: http://www.twics.com/~forest/theforest.html

This page was created by Forest Linton, Computing Japan magazine's Internet columnist. The page has a good set of links to other Japanese sites.



2.5 SITES WITH JAPAN-SPECIFIC INFORMATION

Business and Economics

URL: http://darkwing.uoregon.edu/~felsing/jstuff/biz.html

This Web page contains good information in English on Japanese business and various markets. Links to organizations (like the Keidanren as well as some American business organizations) and academic papers are also included.

Computing Japan Web Page

URL: http:/www.gol.com/cj/

The home page of Computing Japan magazine, Japan's only English magazine covering the information technology and computer markets. Full text of several articles from past issues are available for downloading with links to other important sites included in eachissue's page. On-the-scene reports of computer-related conferences will be available starting this summer.

Impress WWW Server

URL: http://www.impress.co.jp/

The Web page of the publishers of Internet magazine, Japan's premiere magazine covering the Net (in Japanese). The page includes a link to the Akihabara Map program that can give information about shopping in the famous Akihabara area of Tokyo (renowned for its electronics and computer "bargains"). The page also includes some articles from Internet magazine and a map of Web sites in Japan that was under construction as of this writing.

Japan Window

URL: http://jw.stanford.edu/

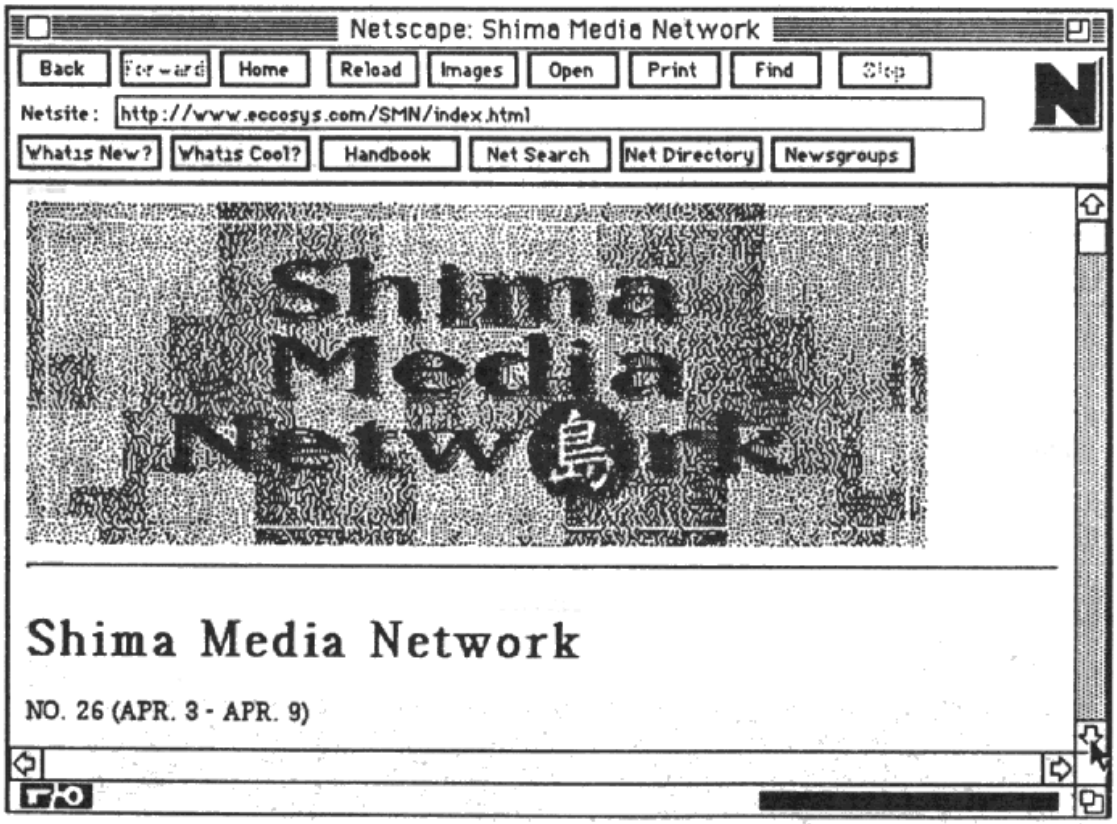
A recent addition by Stanford University which will try to cover all aspects of Japan. There are currently five sections:

Technology, Government, Business, Travel
Living, and Just for Kids. Several areas are still under construction.

Shima Media Network

URL: http://www.eccosys.com/SMN/index.html

This Web page is part of a project started by the former president of NHK. The page contains a great deal of news about Japan as well as links to several other information oriented sites.



Software and Text Processing

URL: http://www.mickey.ai.kyutech.ac.jp/user/santos/FAQ/FAQSLJ.software.html

A very complete reference and starting point for any search of text processing materials on the Web and Internet. The FAQ (frequently asked questions) contains an overview of available information on software and Japanese text processing techniques and has a full set of links to the sites mentioned. An ideal place to start a search for material on localizing and programming for the Japanese market.

The Ministry of Posts and Telecommunications

URL: http://www.mpt.go.jp/

This page is maintained by the MPT, Japan's government agency in charge of setting telecommunications policy. Among other valuable information, the site has the MPT Newsletter in English.

The Japan Advanced Institute of Science and Technology (JAIST) Home Page

URL: http://www.jaist.ac.jp/

The home page of JAIST with information about their current academic projects and links to other technical projects being pursued at other Japanese institutions. A good place to start a search of Japanese technical information available on the Web. Downloading of papers via WAIS also available.

These few Web sites are just a sample of what is on the Japanese Internet, but will help to start you on your way to collecting information from Japan. By making use of the HTML links on the pages, you will soon have your own collection of valuable Web sites and database from which information can be FTPed. While browsing the Web may not garner large amounts of valuble information, the occasional pearl found along the way make the journey more than worth it.

3 INTERNET ACCESS TO JAPANESE S&T INFORMATION

3.1 JICST'S WWW SERVER

The Japan Information Center of Science and Technology (JICST), a quasi-governmental organization under the Science and Technology Agency (STA), has recently launched a new service to provide easy access to Japanese S&T information via Internet's World Wide Web (www). If you have a Macintosh, Windows-based PC or UNIX machine connected to the Internet via modem or LAN, information on Japan's science and technology (including information on individual researchers, outlines of R&D activities in government labs, and translations of major S T-related reports from Japanese government advisory councils) is now readily available.

Access to JICST's WWW Server:

To log on to JICST's WWW server, type its address as follows:

http://www.jicst.go.jp/

JICST's server can also be accessed via Stanford University's US-Japan Technology Management Center (http://www.fuji.stanford.edu/).

JICST WWW Home Page:

As you open the "Home Page" of JICST's WWW Server, the top menu reads as follows:

- o What's new?
- o What's JICST?
- o JICST's various services
- o Japanese Information Related to S&T
- o WWW Server for JICST Databases
- o FTP Server for Reports (including Advisory Council Reports)
- o STANet's Home Servers
- o List of WWW Servers in Japan
- o List of WWW Servers in the World

Opening the sub-menu on "Japanese Information Related to S T" offers the following:

o STA Institutes Directory

General information is given on research activities in each of the following institutes under the STA:

- National Aerospace Laboratory
- National Research Institute for Metals
- National Institute of Radiological Sciences
- National Research Institute for Earth Science and Disaster Prevention
- National Institute for Research in Inorganic Materials
- Japan Atomic Energy Research Institute
- The Japan Information Center of Science and Technology
- The Institute of Physical and Chemical Research
- Research Development Corporation of Japan (including detailed information on STA Fellowship Program)
- Power Reactor and Nuclear Fuel Development Corporation
- National Space Development Agency of Japan
- Japan Marine Science and Technology Center.

o Researchers Directory

This Directory provides information on individual researchers of all Japanese government laboratories based on data compiled by the Research Development Corporation of Japan in 1993, including full name, year of birth, institutional affiliation, position title, higher academic degrees (MS, PhD), research field and theme, titles of published papers, academic societies, present mailing address and contact phone/fax numbers.

o Directory of National Laboratories and Public Research Organizations in Japan

It will be several months before this directory is available. It will include information on all government laboratories of the different Ministries and Agencies.

o Japan Industry Technology Reports

These reports are compiled by JICST to give summaries of technical reports published in various journals by private industries and abstracted for the JICST database. A few hundred samples are included in WWW format.

o Public Reports
Mainly translations of important reports from the Prime Minister's Advisory Councils -- still under development.

o JICST's FTP Server
STA-related reports.

3.2 AIST'S WWW SERVER

While JICST's WWW Server does not provide information on government laboratories falling outside the administrative jurisdiction of STA, the Agency of Industrial Science and Technology (AIST) of the Ministry of International Trade and Industry (MITI) has its own WWW Server providing equivalent information on their laboratories.

To log on to the AIST's WWW, enter the address as follows:
http://www.aist.go.jp/Htmls/TRCHome.html

This WWW server provides the following information:

o General Information on AIST Activities
General information is provided on major R & D programs and other activities of AIST including:
- Industrial Science and Technology Frontier Program
- The New Sunshine Program
- Measures for Regional Technology Development
- Industrial Standardization Activities
- A Survey on Trends in Technology Policies in Japan and Overseas
- Human Frontier Science Program (HFSP)
- International Cooperation in Research and Development
- Promotion of Technological Development in the Private Sector
- Diffusion of Technological Accomplishments
- Industrial Technology Council, MITI

o AIST Institutes Directory

General information is given on research activities in each of the following institutes under the AIST:

- National Institute for Advanced Interdisciplinary Research
- National Research Laboratory of Metrology
- Mechanical Engineering Laboratory
- National Institute of Materials and Chemical Research
- National Institute of Bioscience and Human-Technology
- Geological Survey of Japan
- Electrotechnical Laboratory
- National Institute for Resources and Environment
- Tohoku National Industrial Research Institute

3.3 INTER-MINISTRY RESEARCH INFORMATION NETWORK (IMNET)

The "Inter-Ministry Research Information Network (IMnet)" started operation on 7 Feb. '95, AND connect national test and research organizations thereby going beyond the limits of ministries and agencies.

The Inter-Ministry Research Information Network has basic circuits between Tokyo and Tsukuba and between Tokyo and Osaka. It interconnects 80 organizations, including national research laboratories and semi-government research organization under the supervision of 11 ministries and agencies (including STA and the Ministry of International Trade and Industry). The network also is connected to major domestic research information networks, including Todai International Science Network (TISN), and through international circuits to the US networks.

The completion of the IMnet enables researchers at each research organization to exchange research information, experiment data, image data, etc. directly. The network was constructed this fiscal year under close coordination between related ministries and agencies utilizing the special coordination funds for promoting science and technology

To log on to IMnet, first access STA' WWW Home Page, at WWW.STA.GO.JP, then choose the sub-directory IMnet.

For further information, contact the Science and Technology Information Division, Science and Technology Promotion Bureau, STA at 03-3581-3757.

3.4 OTHER S&T RELATED WWW SERVERS IN JAPAN

Although not as extensive as those of JICST or AIST, many universities and other R & D-oriented organizations in Japan now provide easy-to-access information on their activities via Internet's WWW servers.

WWW SERVER ADDRESSES OF SELECTED R&D ORGANIZATIONS IN JAPAN

1. Governmental Institutions:

Name:	Prime Minister's Office
Address:	http://www.kantei.go.jp/
Name:	AIST
Address:	http://www.aist.go.jp/
Name:	AIST R&D Activity
Address:	http://www.aist.go.jp/Htmls/Research.html
Name:	AIST Tsukuba Research Center
Address:	http://www.aist.go.jp/Htmls/TRCHome.html
Name:	Ministry of Posts &b Telecommunications
Address:	http://www.mpt.go.jp/
Name:	Communications Res. Lab., MPT
Address:	http://www.crl.go.jp/index-J.html
Name:	National Cancer Center
Address:	gopher://gan.ncc.go.jp/
Name:	National Cancer Center
Address:	http://www.ncc.go.jp/
Name:	Animal Genome Database Center
Address:	http://ws4.niai.affrc.go.jp/

2. Special Corporations:

Name:	Japan Information Center of Science and Technology (JICST)

Address: http://www.jicst.go.jp/
Name: Microbiology Data Center, RIKEN
Address: gopher://fragrans.riken.go.jp:70/11/
Name: Inst. of Physical and Chem. Res. (RIKEN)
Address: http://www.riken.go.jp/
Name: ICOT Project
Address: http://www.icot.or.jp/
Name: Real World Computing Project
Address: http://www.rwcp.or.jp/
Name: Radiation Effects Research Foundation (RERF)
Address: http://rerf.or.jp/

3. Universities:

Name: Advanced Inst. of S&T, Hokuriku
Address: http://www.jaist.ac.jp/
Name: Chiba University
Address: http://www.hike.te.chiba-u.ac.jp/
Name: Gunma University
Address: http://www.la.gunma-u.ac.jp/
Name: Hokkaido University
Address: http://www.huie.hokudai.ac.jp/
Name: Keio University
Address: http://www.sfc.keio.ac.jp/
Name: Keio University S&T Campus
Address: http://www.st.keio.ac.jp/
Name: Kobe University
Address: http://www.kobe-u.ac.jp/
Name: Kochi University
Address: http://www.is.kochi-u.ac.jp/
Name: Kumamoto University
Address: http://www.eecs.kumamoto-u.ac.jp/
Name: Kyoto Institute of Technology
Address: http://www.kit.ac.jp/
Name: Kyoto University
Address: http://www.kyoto-u.ac.jp/
Name: Kyushu Institute of Technology
Address: http://www.kyutech.ac.jp/
Name: Kyushu University
Address: http://www.kyushu-u.ac.jp/.
Name: Meiji University

Address: http://www.meiji.ac.jp/
Name: Miyazaki University
Address: http://www.miyazaki-u.ac.jp/
Name: Nagoya Institute of Technology
Address: http://www.nitech.ac.jp/
Name: Nagoya University
Address: http://www.nagoya-u.ac.jp/
Name: National University of Information and Library Sciences
Address: http://ulispsn.ulis.ac.jp:8001/
Name: Ocean Research Institute, U of Tokyo
Address: http://www.dante.ori_u-tokyo.ac.jp/
Name: Osaka Medical College
Address: http://www.osaka-med.ac.jp/
Name: Osaka University
Address: http://www.osaka-u.ac.jp/
Name: Osaka University of Education
Address: http://www.okumedia.oc.osaka-kyoiku.ac.jp/
Name: Saga University
Address: http://www.cc.saga-u.ac.jp/
Name: Saitama University
Address: http://www.ke.ics.saitama-u.ac.jp/
Name: Science University of Tokyo
Address: http://www.sut.ac.jp/docsj/index.html
Name: Tohoku University
Address: http://www.tohoku.ac.jp/
Name: Tokushima University
Address: http://tokushima-u.ac.jp/
Name: Tokyo Institute of Technology
Address: http://www.soc.titech.ac.jp/
Name: Toyohashi University of Technology
Address: http://www.tut.ac.jp/
Name: University of Electro-communications
Address: http://www.uec.ac.jp/
Name: University of Tokyo (Komaba Campus)
Address: http://www.c.u-tokyo.ac.jp:8080/
Name: University of Tokyo (Physics Dept)
Address: http://www.phys.s.u-tokyo.ac.jp/
Name: University of Tokyo
Address: http://www.u-tokyo.ac.jp/
Name: Utsunomiya University
Address: http://www.utsunomiya-u.ac.jp/

Name: Wakayama University
Address: http://fumi.eco.wakayama-u.ac.jp/

4. Inter-University Research Institutes:

Name: DNA Bank in National Institute of Genetics
Address: gopher://gopher.nig.ac.jp:70/11/
Name: Institute for Molecular Science (IMS), Okazaki
Address: http://ccinfo.ims.ac.jp/index.html
Name: National Institute for Basic Biology, Okazaki
Address: http://www.nibb.ac.jp/index.html
Name: National Institute for Physiological Sciences, Okazaki
Address: http://www.nips.ac.jp/
Name: National Laboratory for High Energy Physics (KEK)
Address: http://www.kek.jp/
Name: National Center for Science Information Systems (NACSIS)
Address: http://www.nacsis.ac.jp/nacsis.index.html

5. Private Sector:

Name: Genome Project in Japan
Address: http://www.genome.ad.jp/
Name: DEC Japan Inc.
Address: http://www.dec-J.co.jp/
Name: Fuji Xerox Inc.
Address: http://www.fujixerox.co.jp/
Name: Fujitsu Ltd.
Address: http://www.fujitsu.co.jp/
Name: GLOCOM
Address: http://www.glocom.ac.jp/
Name: Hitachi Ltd. Research Labs.
Address: http://www.hitachi.co.jp/Rd/index.html
Name: KDD Research Laboratories
Address: http://www.Lab.kdd.co.jp/
Name: Matsushita Electric Industries, Ltd.
Address: http://www.mei.co.jp/
Name: Nippon Telegraph & Telephone Corp. (NTT)
Address: http://www.ntt.jp/index.html
Name: Nippon Telegraph & Telephone Corp. Labs
Address: http://www.info.hqs.cae.ntt.jp/
Name: Sony Computer Science Labs.
Address: http://www.csl.sony.co.jp/
Name: Sony Corporation
Address: http://www1.sony.co.jp/

Name: WIDE Project
Address: http://www.wide.ad.jp/

Credits: *Computing Japan*
National Science Foundation, Tokyo

Thierry Consigny can be contacted at consigny@twics.com or consigny.thierry@iac-online.com

OFFICIAL JAPANESE INTELLECTUAL PROPERTY INFORMATION AND PATOLIS

Dr. Günther Vacek
Japanese Patent Information Department
European Patent Office, Vienna Sub-office
Vienna, Austria

Abstract

Japanese patent information is published and made available to the public in various forms. Be it in conventional form (paper) or be it in more advanced forms (online, or even on CD-ROM as of most recently), this information represents an important rneans of surveying global innovation trends and moreover the innovative activities of Japan. Accessing this information usually makes heavy demands on the user, especially since the greater part of this information is available in the Japanese language only. In the past years, great efforts on both the Japanese and the European part have helped to facilitate the access to Japanese patent information by supplying at least part of the information in English, and, on the other hand, by improving the means for accessing Japanese patent information. This meant a major success in helping to overcome the natural barrier which the Japanese language poses to most non-Japanese-speaking users of Japanese patent information.

1 INTRODUCTION

Over the past decades patent information from Japan has become one of the most important indicator for innovative activities in Japan, for developments in technology and new trends in high-technology. Of the more than 1.3 million patent and utility model documents published each year around the world, between 30 and 40 percent are published in Japan. With 90,000 patents granted each year - the number of granted patents often being regarded as a clearer indication of a country's innovative capability - Japan takes the lead over other industrial nations. It is therefore no exaggeration to say that the publications of Japanese patent and utility model documents present an almost inexhaustable source of information on the prior art of

global technological development; a source, which - due to the language barrier - is usually not utilizer as efficiently as could be. Patent information from Japan can be used in manifold ways: primarily it may serve as indicator for the prior art in various specialised fields or branches. It may furthermore present a starting point for improvement or further development of known applications of certain inventions. It may on the other hand also be used to protect one's own market, to prevent competitors from expanding certain patenting strategies or even to obtain evidence in patent related disputes or lawsuits.

Information on Japanese industrial property rights is available via all of today's most commonly used media, be it in printed form, be it online or on CD-ROM as of late. In the following, the whole range of products available to the public shall be described in detail.

2 PRODUCTS IN WESTERN LANGUAGES (ENGLISH)

2.1 IN PRINTED FORM

2.1.1 English abstracts of unexamined patent applications (PAJ)

In 1976, JAPIO and the Japanese Patent Office started to produce English-language abstracts of Japanese unexamined patent applications for certain IPC-classes and to publish those in the form of booklets, with one volume comprising 500 abstracts. This publication series has become known as "Patent Abstracts of Japan" or "PAJ" for short. Publication was according to a subdivision into four individual technical fields, namely the General and Mechanical Field (M), the Chemical Field (C), the Electrical Field (E) and the Physical Field (P). From October 1976 to June 1989 only certain sections of unexamined patent applications were furnished with English abstracts; since July 1989 all Japanese-based patent applications are provided with English abstracts. No abstracts were produced for applications which were filed by non-Japanese applicants (foreign-based applications). The last volumes of PAJ in this form were issued for the publication month of September 1994. Since the beginning of 1995 this publication series has been replaced by a corresponding CD-ROM product.

English abstracts of Japanese unexamined patent applications (PAJ) in the printed form are available at most national patent offices. Copies of certain abstracts can also be ordered among others, from the European Patent Office.

2.2 CD-ROM PRODUCTS

2.2.1 English abstracts of unexamined patent applications (PAJ)

This paragraph refers to the same data which are described under the heading "in printed form" or "online-databases".

Starting with publication date January 1994 PAJ are issued on CD-ROM. They are produced by the Japanese Patent Office and distributed on behalf of the Japanese Patent Office by Japio. In Europe these CD-ROMs can be ordered from the European Patent Office.

Starting with publication date January 1994 one CD-ROM is issued every month containing all the English abstracts and bibliographic data of one month's unexamined patent applications in numerical order. The data originating before 1994 (i.e.: 1976 to 1993) will also be fully published on CD-ROM. Production of these data is gradual and is expected to be completed by mid-1996. However, these data are published not in numerical order but according to special fields (IPC related), the complete data will, therefore, be covered on one to three discs, depending on the size of the respective fields. The complete data records will be stored on altogether 99 discs.

English abstracts of Japanese unexamined patent applications (PAJ) on CD-ROM will be available to the public at most national patent offices. Copies of certain abstracts can also be ordered from among others, the European Patent Officc.

2.3 ONLINE DATABASES

2.3.1 English Abstracts of unexamined patent applications (PAJ)

This paragraph refers to the same data as described in the above paragraphs.

The database (called 'Japio' after the producer of the data, namely the Japan Patent Information Organization) contains not only English abstracts but also the bibliographic data of foreign-based patent applications. The data records in this database are searchable using either bibliographic data or keywords, combined searches are also possible. This database can be accessed via commercial hosts like Dialog, Qucstel-Orbit or STN.

2.3.2 INPADOC database

The INPADOC database represents the second, most comprehensive source for Japanese patent information in a western language. This database, whose chief aim is the reunion of patent families, contains the bibliographic data of all Japanese unexamined and examined patent publications since 1973. It does, however, not store any abstracts. This database is available via commercial host like Dialog, Questel-Orbit, STN as well as PATOLIS in Japan.

2.3.3 Other databases

Apart from the above mentioned databases, there are two other important providers of data with Japanese patent information, these are CAS (Chemical Abstract Services) and Derwent. Both enterprises have specialised in producing English abstracts for patent publications and partly offer data on Japanese patent documents. While CAS is specialised in the chemical field, Derwent produces abstracts in certain selected technical fields. The abstracts produced by both companies are of high quality and suited for doing subject searches. Data records date back into the 1960’s, however, they cover only parts of the Japanese patent literature. These data are available via the commercial hosts STN, Dialog and Questel-Orbit.

3 PRODUCTS IN JAPANESE

3.1. IN PRINTED FORM

3.1.1 Japanese intellectual property gazettes in Japanese

The Japanese Patent Office issues a range of publications on a regular basis which offer information on current Japanese intellectual property rights. Some of the most important of these publications are listed below:

Examined patent applications (*tokkyo shutsugan kokoku*): 1921 - 1993
Unexamined patent applications (*tokkyo shutsugan kokai*): 1971 - 1992
Examined utility model applications (*jitsuyo shinan kokoku*): 1921 - 1993
Unexamined utility model applications (*jitsuyo shinan kokai*): 1971 - 1992
Registered designs publications (*isho koho*)
Examined trademark applications (*shohyo koho*)
Appeal board and court decisions concerning patents, utility models, designs and trademarks (*shinketsu koho*)
Patent office official bulletins: lists of granted patents, utility models, registered trademarks (*tokkyo-, jitsuyo shinan-, shohyo-mokuroku*)
Patent office official bulletins: lists of requests for examination - patents and utility models (*shinsa seikyu risuto*)
Patent office official bulletins: lists of final actions - patents and utility models (*saishu shobun risuto*)
Patent office official bulletins: annual report (*nenpo*)

Publications of Japanese patent and partly utility model documents are available to the public in Europe in most national patent offices; most other publications are only available in exceptional cases.

3.2 CD-ROM

3.2.1 Japanese intellectual property gazettes in Japanese

Starting in 1993 the Japanese Patent Office discontinued part of its paper publications and started publishing on CD-ROM instead. The following

publications are issued on CD-ROM, all other publications are still being issued in the printed form:

Examined patent applications (*tokkyo shutsugan kokoku*): 1994 -
Unexamined patent applications (*tokkyo shutsugan kokai*): 1993 -
Examined utility model applications (*jitsuyo shinan kokoku*): 1994 -
Unexamined utility model applications (*jitsuyo shinan kokai*): 1993 -
Registered utility model publications (*toroku jitsuyo shinan*): 1994 -

Thse publications are available to the public in most national patent offices and may be used by the public as part of the library service.

3.3 ONLINE DATABASES

3.3.1 PATOLIS

PATOLIS is the only comprehensive database worldwide specialising in Japanese documents from the field of intellectual property. It is produced by Japio (Japan Patent Information Organization) in Tokyo and contains four important files on Japanese intellectual property rights, namely on patent documents, utility model documents, trademarks and industrial designs. There is, in fact, no other database which is similarily comprehensive as far as time period covered and data coverage is concerned: patent publications have been contained since 1955, utility model publications since 1960, industrial designs since 1965 and coverage of trademarks even dates back to 1899.

PATOLIS is the only database which offers information not only on patents, but also on utility models, trademarks and industrial designs.

Numbers of all the different publication steps for all these documents are stored in the database as well as the relevant registration dates. Apart from the bibliographic data, abstracts have been included for patent publications (since 1971) and for utility model publications (since 1980), the database thus being a unique tool for anyone doing searches on Japanese industrial property rights. Since 1980 drawings have been stored for both patents and utility models, drawings for trademarks have been included ever since 1976.

Furthermore, PATOLIS is the only database which contains the up-to-date legal status information for all of the above mentioned documcnts. On top of that, it has to be mentioned that there is no other database with Japanese data that has a similarily high updating frequency.

Since January 1995 the database has been open 24 hours from Monday through Friday, thus making possible fast access to the most up-to-date information at any time throughout working days. Presently, the database is operating with a transmission speed of 1200 baud, for the near future it is, however, expected that the transmission speed will be raised to 2400 baud.

Even though the database is entirely in the Japanese language, it is open to all users. For displaying the Japanese characters, however, a special hard- and software is needed. In order to avoid the problem of having to purchase Japanese hardware, the European Patent Office has developed a software package which allows accessing and searching in Japanese databases with standard European PCs (IBM compatible). Apart from making possible both display as well as input of Japanese characters, this software, the so-called EPIDOS-INPADOC Kanji Terminal Emulator, automatically translates a certain part of the Japanese data into English.

Thus even non-Japanese-speaking users can carry out some searches, especially legal status searches, in PATOLIS. For subject searches using keywords, knowledge of the Japanese language is, however, essential. The retrieval language of the database is comparable to standard Western databases. For simple searches it, therefore, takes only a little effort to become familiar with the retrieval possibilities of PATOLIS. Commands like DISPLAY, EXPAND, FIND, GENERATE, HISTORY, LIMIT, LIST, PRINT, SORT, etc. allow for more or less unproblematic searches despite the Japanese language.

Altogether up to 70 searchable data fields and more than 200 displayable data fields are contained in the four files in PATOLIS. Apart from bibliographic information like titel, applicant, inventor, classification, various document numbers or free keywords in titels and abstracts, additional information concerning for example type of application, domestic priorities, change of document type, opponent's name, kind of opposition, cited

references (partially provided) and information on the trial procedure, etc. can be displayed in free formats.

Output of the retrieved data can be online as well as offline. While only fixed formats are available for offline-printouts, online-printouts of search results can be had both in certain fixed formats (e.g. bibliographic data, abstract, legal status to quote just a few of the most commonly used fixed formats) as well as in user-defined free formats. Drawings, which are included for parts of the documents, can only be supplied in form of offline-printouts. These offline-printouts are usually sent to the users by mail. For the near future it is, however, expected that a fax-service available to Japancse users will also be extended to European users. By inputting a special command, the online search results will be directly transmitted from the database onto the user's fax-machine. The user is, thus, supplied with all the data relevant to a certain document within a few minutes.

The database is updated twice per month. The time delay between publication of data and their being available in the database is therefore only between two and three weeks. PATOLIS is thus not only the most comprehensive, but also the most up-to-date source for Japanese patent information.

The costs for accessing the database are made up of connection time and hit charge. They amount to about 300,- DM per hour, the price differing somewhat depending on the file. These are costs comparable to most other (Western) patent databases.

There is, of course, a whole range of Japanese documentation on the use of the database. On top of that, the European Patent Office has produced a user manual in English as well as an applicants' code list for PATOLIS in English. These efforts were taken in order to provide another help tool for searches carried out independently by European users who do not speak Japanese, but who would like to take advantage of the enormous potential offered by PATOLIS in using the EPIDOS-INPADOC Kanji Terminal Emulator with its integrated translation tool.

PATOLIS has a number of advantages over other standard databases containing information on Japanese industrial property rights. If the complete range of information available is to be covered, the database thus becomes an essential search tool. A list of the database's main advantages over other comparable databases is given below:

1. Patents
   - data from 1955 onwards
   - all fields covered
   - abstracts from 1971 onwards
   - drawings from 1980 onwards
   - legal status information, cited references, domestic priorities
   - all document numbers contained
   - most data fields only available in PATOLIS
   - frequent updating, most up-to-date data

2. Utility models
   - the only database offering information on Japanese utility models
   - content-wise similar to patents (see above)
   - data from 1960 onwards
   - abstracts from 1980 onwards
   - drawings from 1980 onwards

3. Industrial designs
   - the only database containing information on Japanese industrial designs
   - data from 1965 onwards

4. Trademarks
   - the only database containing information on Japanese trademarks
   - data from 1899 onwards

The European Patent Office represents PATOLIS in all of Europe, additionally, Aho&Meguro in Helsinki represent PATOLIS in Scandinavia. Direct access to PATOLIS is provided by the European Patent Office, Vienna Sub-Office.

4 CONCLUSION

Japanese patent information is published and made available to the public in various forms. The main problems encountered by the non-Japanese user is the language barrier on the one hand, but also the enormous amount of data which have to be taken into account, when a thorough search is needed. Modern media like CD-ROM and online-databases help gain an overview over existing industrial property rights in Japan. For a reliable survey it is still essential to go beyond the borders of English-speaking areas and to access original Japanese data. Tools like partly automatic translation modules can help to facilitate access to these data.

JAPANESE PATENT INFORMATION ON STN INTERNATIONAL

Dr. Claus-Dieter Siems, Manager Product Service
Rainer Stuike-Prill, Product Manager
Fachinformationszentrum Karlsruhe
- STN Service Center Europe -
Karlsruhe, Germany

Abstract

Japanese patent information can be found in many databases. STN International is offering all important international patent databases and in addition national patent databases from the leading industrial countries, eg. from USA, Germany, and last not least from Japan. If there is interest in the Japanese market it is necessary to monitor Japanese patent information. The JAPIO database gives comprehensive information on new technological developments in and from Japan, not covered in other databases. Searching the STN patent database cluster gives the best information for a subject search because each database has its special field contents, e.g. own title, abstract, claim, graphics, or indexing. With STNs statistical tools it is possible to analyse these results.

1 JAPIO ON STN INTERNATIONAL

Patent information from the leading industrial regions of the world is very important for e.g. a company who wants to invest in the developing of a new product for the international market. This information can be found in patent databases of international coverage. However, a more complete coverage is often obtained from national patent databases. STN International is offering all important international patent databases (INPADOC, WPI, CA, APIPAT, PATOSEP, PATOSWO) and in addition national patent databases from the leading industrial countries, eg. from USA (IFI Claims and USPATFULL), Germany (PATDPA, PATDD, PATOSDE) and last not least from Japan (JAPIO). The importance of Japan at the forefront of scientific and technological developments and therefore its role on international markets, and also if there is interest in the

Japanese market, makes it indispensable to monitor Japanese patent information.

JAPIO (Japan Patent Information Organization database) gives comprehensive information on new technological developments in and from Japan. This patent database is providing the most comprehensive English-language access to Japanese unexamined patent applications (Kokai Tokkyo Koho) in all technologies, i.e. all classes of the International Patent Classification, from October 1976 to date (more than 4.5 mio. records). The records contain assignee data, publication information, International Patent Classification codes, JAPIO classification codes, and controlled terms, as well as the title and abstract in English. Abstracts are available for all applications originating in Japan. The database is updated monthly with about 22.000 new records. An example can be found in Figure 1.

The JAPIO file is well suited for subject-based searches. The Basic Index, comprising the title and the abstract provides a good base for searching inventions to a particular topic. The IPC together with the JAPIO classification, and fixed keywords gives the possibility to search for an overview of technological inventions. Main attraction of the file lies in areas not covered elsewhere, i.e. general and mechanical, and electrical. With STNs statistical tools (SELECT or SMARTSELECT) it is possible to analyse the data in different ways, e.g. list of companies (patent assignees), or the changes of the scope (IPC) over years for a specific company.

2 THE STN PATENT DATABASE CLUSTER

Japanese patent information can be found in different databases. The avaibility of the different kinds of Japanese patent publications in the STN patent database cluster can be found in Table 1. Coverage is also different because in nearly all patent databases only selected publications are available for the past (see Table 2). The number of records that are in the different databases of the STN patent cluster with origin of the first application (priority) in Japan is given in Table 3. Because of the different field entries for title, abstract, classification etc. only a cluster search gives the best result. Using then the new STN family search capability

(FSEARCH and/or FSORT) groups the records for a patent family and eliminates duplicates.

A search in the STN patent cluster collects therefore all the database entries for a patent family from different databases, and the user can then see the maximum information for a patent: e.g.

own abstracts:	CAPLUS, WPI
abstracts:	JAPIO, IFIPAT, PATOS(EP, WO), USPATFULL
own title:	CAPLUS, WPI
claims:	IFIPAT, PATOS(DE,EP), USPATFULL
full-text:	USPATFULL
indexing:	APIPAT, CAPLUS, IFIPAT, JAPIO, WPI (subscribers only), USPATFULL
graphics:	CAPLUS (chem. structures), PATDPA (techn. drawings), WPI (technical drawings and some chem. structures)

In Figure 1 you see as an example the records from the files JAPIO and WPINDEX for the patent application number JP 87-168384. In WPINDEX no abstracts are available for electrical, and general mechanical patents until 1995, but for about 400.000 Japanese patent publications technical drawings are available in this scope.

Table 1. Japanese Patent Information(JP/PC) in English-language patent databases (international).

Database	**Subject Coverage**	**Kind of Data**	**Time**	**No. of Japan. Publications [mio]**
APIPAT	petroleum, petrochem.	bibliographic, chemical indexing, IPC, abstracts	1964-	0.5
CA	chemical	bibliographic, chemical indexing, IPC, abstracts	1964-	0.9
INPADOC	all IPC	bibliographic, IPC, families	1973-	6.7
JAPIO	all IPC	bibliographic, CC, CT, IPC, abstracts	1976-	4.7
WPI	all IPC, some only partly	bibliographic, IPC, families, for all areas chemical and electrical indexing, abstracts for chem., and electr. (1995-), images for all areas (1988-)	general, mechan. 1974- selected chemistry 1963- all chem. 1970- electr. (unexam.) 1982-	chem.(CPI) 1.8 electr. (EPI) 1.3 other (GMPI) 0.7 (with doublets in CPI, EPI, GMPI)

Table 2. Kind of Document coverage (JPXX/PK).

Kind Code	**Document Coverage**	**Database**	**Time**
A	Old Act examined patent application *selected, residents application only* ---	WPI APIPAT CAS	1963-1971 1964-1971 1918-1971
A2	Unexamined OPI patent application *selected* ---------- *all applications* ----------	INPADOC WPI CAS JAPIO APIPAT	1973- 1971- 1971-1975 1975- 1976- 1971-
B4	Examined OPI patent application	INPADOC WPI CAS	1973- 1971- 1971-

Table 3. STNINDEX gives e.g. an overview of the coverage of patent publications with priority country Japan (JP/PRC; April 1995) in the STN patent database cluster.

```
=> EXPAND JP/PRC
...E3                  13288312 --> JP/PRC
       APIPAT             58438        JP/PRC
       CAPLUS             95031        JP/PRC
       IFIPAT            274862        JP/PRC
       INPADOC          7183617        JP/PRC
       JAPIO                  0        JP/PRC *)
       PAPERCHEM           4092        JP/PRC
       PATDD                454        JP/PRC
       PATDPA            211360        JP/PRC
       PATOSDE           101619        JP/PRC
       PATOSEP           107109        JP/PRC
       PATOSWO            13325        JP/PRC
       PIRA                 241        JP/PRC
       RAPRA               1664        JP/PRC
       USPATFULL         270576        JP/PRC
       WPINDEX          2451697        JP/PRC
```

**) Remark:* Priority application information is given in JAPIO only if priority country is not JP.

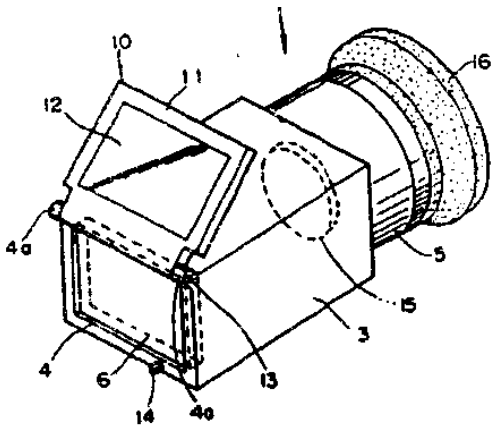
Figure 1. Record from JAPIO in the indented display form.

```
ACCESSION NUMBER:         89-012686    JAPIO
TITLE:                    VIEW FINDER FOR CAMERA
INVENTOR:                 FUKUSHIMA OSAMU; HIRAKI HIROSHI;
SHIMADA
                          MITSUHIRO; KAMAYA NAOKI
PATENT ASSIGNEE(S):       SONY CORP,  JP   (CO  000218)
PATENT INFORMATION:

     PATENT NO    KIND   DATE        ERA     MAIN IPC
     ------------------------------------------------------
     JP 01012686  A      19890117    Heisei  (4) H04N005-225

APPLICATION INFORMATION
     STN FORMAT:          JP 87-168384    19870706
     ORIGINAL:            JP62168384      Heisei
SOURCE:                   PATENT ABSTRACTS OF JAPAN, Unexamined
                          Applications, Section: E, Sect. No.753,
                          Vol.13, No. 192, P. 11 (19890509)
INT. PATENT CLASSIF.:
     MAIN:                (4) H04N005-225
CLASSIFICATION:           44.6  COMMUNICATION - Television
CONTROLLED TERM:          R011  COMMON - Liquid crystal
```

ABSTRACT:
PURPOSE: To contrive to attain low power consumption, small size and light weight by using a back light means radiating a white light in closing the opening only when a camera is used at a dark place such as indoor place.
CONSTITUTION: In using a video camera at an indoor dark place, a back light means 10 is turned downward and an opening 4 of a view finder main body 3 is closed, then the switch 14 is turned on and a cold cathode fluorescent lamp 12 of a back light means 10 is lighted. The light from the white light source B from the cold cathode fluorescent lamp 12 is made incident in the polarized plate 7 placed at the rear face of the color liquid crystal panel 6 and an object of the same color as the state of the picture picked up by a photographer by using a video camera is displayed on a color liquid crystal panel 6. The state is confirmed by peeping the eye cup 16 of the view finder 2. Thus, the back lighting power is reduced, the device is made small in size and light in the weight.

Record from Derwents World Patents Index for the same patent application; standard display form with image:

AN 89-058993 [08] WPINDEX
TI Viewfinder for video camera - uses liquid-crystal display panel having switch for ON-OFF control of back illumination light NoAbstract Dwg 1/10.
DC W04
PA (SONY) SONY CORP
CYC 1
PI JP 01012686 A 890117 (8908)* 8 pp
ADT JP 01012686 A JP 87-168384 870706
PRAI JP 87-168384 870706
IC H04N005-22



FS EPI
FA NOAB; GI
MC EPI: W04-M01D

DO IT YOURSELF: THE HARDWARE AND SOFTWARE REQUIRED FOR USING JAPANESE DATABASES

Mr. Esko Aho, President
Aho & Meguro
Helsinki, Finland

Abstract

Japanese databases can be used from abroad by any terminal or PC provided with a communication software and a printer, if all of the three separately and/or in combination can handle Japanese characters. Normal Western PC or Mac hardware can be conveniently used if it is provided with suitable software. The combination of a Western PC, the bilingual Japanese-English DOS/V operating system, Japanese Windows 3.1 and a Windows-compatible communication software can be recommended for non-Japanese users outside of Japan. There are usually no problems with telecommunication networks or modems.

1 BASIC PROBLEMS

In handling the Japanese language with computers, there are basically three problems: (1) the large number of different characters in current use, (2) the complex patterns of the characters for display and printing purposes, and (3) the difficulty of inputting the over 7000 different characters, with many homonyms (characters with the same pronunciation but a different meaning) and different pronunciations for the same character in different combinations.

Japanese computers use the JIS character set defined in JIS C 6226-1983 to identify the Japanese phonetic syllabaries (hiragana, katakana), Chinese ideographs (kanji), Latin alphabet (romaji) and Arabic numerals (arabia suji) currently used in Japanese. In addition to these, the JIS character set also contains Greek and Cyrillic characters plus some special symbols, but not for example the Scandinavian characters (ääö). Since Western

computers are mostly limited to the so-called ASCII character set, special solutions must be used for handling Japanese in Western computers.

The proposed Unicode character set may eventually provide a universal solution if it will be incorporated in a generally used operating system such as the Windows NT in the future, but today we just have to accept this difference of character sets. While the ASCII character set is defined by one byte per character, the JIS character set needs two bytes per character.

2 SOLUTIONS COMMONLY USED IN JAPAN

Conventionally fonts for the JIS character set are stored in each Japanese computer and printer as a ROM module, containing display and/or printer fonts as dot matrix patterns which generally differ from those of other makers. The operating systems in the computers of different makers have also been incompatible with each other, although most personal computers have recently used (their own) DOS-based operating systems. The result is that Japanese DOS software must be written separately for the personal computers of NEC, Fujitsu, Toshiba, IBM and other domestic makers, and that it cannot be run in foreign PC hardware. A perfect example of this is the best-known Japanese communication software for database access, the PCOM α II from Personal Business Assist: it is sold in at least 25 different DOS versions for different PC makes and types such as seven different NEC versions, four Fujitsu, two IBM, one Toshiba, two Mitsubishi, three Matsushita, two Sharp versions and so on. It can be said that the Japanese PC software market has been very hardware-dependent.

Thus the common solution is to have a Japanese PC (e.g. NEC PC-98 or Toshiba DynaBook), a Japanese dot matrix printer (e.g. Epson or Toshiba) and a Japanese communication software (e.g. MyTalk or PCOM α II) written for that hardware. Such combinations work well and are relatively cheap, but for the foreign user in Europe they pose the problems that all of the components must be bought in Japan, there is no maintenance or other support for any of them in Europe, and all the manuals are in Japanese only.

3 NEW SOLUTIONS FOR FOREIGNERS

Recently IBM Japan developed an open Japanese-English PC operating system, the DOS/V with the revolutionary idea of handling the JIS character set and its fonts entirely by the software, not relying on hardware-dependent ROM modules. This operating system made it possible to handle both standard English DOS software and Japanese characters by PC/AT-compatible hardware, thus solving one of the foreign users' problems. In addition to IBM Japan, Toshiba, Fujitsu and many others have gradually adopted DOS/V as their sole Japanese PC operating system, and only NEC still sticks to its own DOS version in the Japanese market.

Another lucky development is Microsoft Windows 3.1J, the Japanese version of Windows with Japanese TrueType fonts. This solves the problem of lacking maintenance for Japanese printers, since any common dot matrix or laser printer (e.g. HP LaserJet 4) with a Windows 3.1 driver and a sufficient memory can be used for printing Japanese TrueType fonts. Windows 3.1J is now separately available in Japan for DOS/V and the NEC, IBM, Toshiba, Fujitsu and Epson versions of DOS.

Windows 3.1J also eases the software problem: since it provides a common platform for even Japanese software irrespective of the underlying hardware and Japanese DOS version, any Japanese software for Windows 3.1J can be run in any Japanese or Western PC provided with Windows 3.1J. One example of such software for database access is the MyTalk for Windows.

The increasing popularity of DOS/V and Windows 3.1J has made it attractive for large US software developers to produce Japanese versions of their standard Windows software. It is now possible to buy Japanese versions of Microsoft Office for Windows 4.3, Microsoft Word for Windows 6.0, Novell WordPerfect for Windows 6.0, Lotus AmiPro for Windows R3.1, IBM OS/2 Warp V.3 and many more. An apparent advantage for the foreign user is that since the operating of these Japanese versions is almost identical with the Western versions, it is not necessary to read Japanese manuals for every little problem - a corresponding manual and experienced

users are available in your own language, be it English, German, French, Swedish, Danish, Norwegian, Finnish or Estonian!
Examples of generally known communication software which have recently become available in Japanese are the Terminal contained in Microsoft Windows 3.1, the HyperAccess Lite for OS/2 and the IBM Internet Connection for OS/2 contained in the IBM OS/2 Warp V.3, the Netscape Navigator for Windows and the Super-TCP 4.0 for Windows.

4 OTHER SOLUTIONS

For the Apple Macintosh, there are equivalent solutions based on the Japanese Mac operating system, the latest being the KanjiTalk 7.5, and Japanese communication software running under it.

In the US, many hybrid solutions are available for the Western PC with word processing software such as KanjiWord and telecommunication software such as KCOM that run and handle Japanese characters under the standard US Windows 3.1. An excellent source for information on such software and their use is the Japan Forum of CompuServe.

In Japan, many word processors can be provided with modems and communication software, and then used for accessing databases. This is a fairly cheap solution for users who mainly need a compact Japanese word processor and only occasionally access Japanese databases.

5 MORE INFORMATION

As computers and software develop very rapidly, no books can be actually recommended. Instead, it is advisable to read Japanese computer magazines such as Nikkei Pasokon, Nikkei Byte or DOS/V Magazine - in Japanese!

MACHINE TRANSLATION OF JAPANESE - NEW POSSIBILITIES?

Mr. Mats Tallving, Research Assistant
European Institute of Japanese Studies, Stockholm School of Economics
Stockholm, Sweden

Abstract

This paper briefly describes the machine translation (MT) process and presents a case study of practical application of MT. Further, some advantages and shortcomings of MT are discussed, and an attempt is made to outline the future directions and applications of MT. The author stresses the importance of good MT dictionary facilities and continuous dictionary maintenance to obtain good translation quality. Another essential point influencing the success of future developments and applications of MT systems, is the ability to customise systems and applications to meet end-user needs. Please note that this paper discusses MT from the point of view of translating text data (as opposed to voice data) from Japanese to English, so called J/E MT.

1 WHAT IS MACHINE TRANSLATION?[22]

The term machine translation (MT), as it will be used in this paper, will refer to varying degrees of computer-aided translation of text data from one language into another. Specifically, the translation of Japanese (source language) text data into English (target language) text data, so called J/E MT. Given the complexity of the Japanese language, and the fact that it has little or no likeness whatsoever with the English language (not being an easy language in itself), it can be understood that developing a computer program to effectively translate between the two, is quite a remarkable task. A brief

[22] This paper is partly a compilation of previously published (see reference list at the end of the paper [1, 2, 5]) and unpublished material [3, 4] originating from the members of the Japanese Database and Machine Translation Research Group at the Research Policy Institute, Lund University, Sweden, from the period 1990-1992. The members of the group were: Ms. Patricia Nelson (currently Ph.D. student at the European Institute of Japanese Studies, Stockholm School of Economics), Prof. Jon Sigurdson (currently Visiting Prof. of Science and Technology at the European Institute of Japanese Studies, Stockholm School of Economics), and the author.

description of the machine translation process followed by a few examples of varying degrees of MT will perhaps better illustrate the point.

1.1 THE MACHINE TRANSLATION PROCESS[23]

The source language text data, in this case Japanese, can be entered into the computer in much the same manner as that for entering text data into conventional word-processors. After text input, most MT systems require that the source text be pre-edited prior to translation. This could also be called “machine-adapting”. The text is edited according to specific rules, which are provided by the MT system producer and/or created by the MT end-user as a result of user-experience, in order to facilitate the translation process and generate a higher-quality output.

The next step, considered to be one of the more important, is the selection of electronic dictionaries to be used for translating vocabulary. Normally, three dictionaries can be chosen for simultaneous use: a basic dictionary containing 60 - 70,000 general words; a subject-specific dictionary, e.g. ceramics or electronics; and finally a user-dictionary, i.e. a dictionary compiled and tailor-made by the user him/herself. The MT system will use the following priority order when looking up a word during the translation process: basic dictionary → subject-specific dictionary → user dictionary. After these preparations have been made, the source text can be translated.

There are two methods that dominate the way the translation process occurs, these are the transfer method and the pivot method. The former method generates the target text directly from the source text data, whereas the latter will first generate an intermediate “pivot-language”, sometimes called inter-lingua, from which the target text is consequently produced. The resultant text usually has to be proof-read or, using MT-terminology, post-edited into better English.

An important part of the post-editing process is entering words that have not been translated into the user dictionary. Continuous dictionary maintenance

[23] Please note that the following explanation of the MT process is kept at a general level and does not refer to any specific MT system.

is essential to the performance and improvement of the MT system over time, and can therefore not be neglected. In some cases, when the translation result is very poor, containing many words which have not been translated, it may be necessary to repeat the translation process after dictionary maintenance has been performed. This will then conclude the MT cycle running from source language to target language.

1.2 DEGREES OF MACHINE TRANSLATION

Four levels of MT, or degrees of MT, ranging from fully automatic MT to computer-aided MT will be described below.

1.2.1 Automatic machine translation

Automatic MT implies quite simply: (1) source text input, (2) machine translation, and (3) target text output. The process does not require any pre-editing or post-editing at all, should this be necessary, the system cannot be considered fully automatic. This is the most advanced form of MT and can possibly work in an environment with strictly controlled vocabulary and syntax. It is on this level, for example, that voice data translation projects are found, such as those conducted by Kyoto-based ATR Interpreting Telephony Research Laboratories of the Advanced Telecommunications Research Institute International [6].

1.2.2 Machine translation with pre-editing and post-editing

MT coupled with both pre-editing and post-editing is the most common way of utilising MT today. Of the levels described, it is the most practicable and commercially viable, but it is also time-consuming and demands both excellent language and MT proficiency of the user. Depending on the character of the source text, i.e. if it is already “MT-friendly”, it is possible to skip pre-editing and only post-edit the text.

1.2.3 Machine translation with automatic text-formatting

This is a variant of the above described MT level, and was a method devised and used by the Japanese Database and Machine Translation Research Group at the Research Policy Institute (RPI), Lund University, Sweden. The pre-editing function is performed by a text-formatting program developed to automatically prepare the text for MT. See below for an explanation of how the RPI Group used this method.

1.2.4 Computer-aided machine translation

Computer-aided MT is the most basic form of MT[24]. It could be broadly defined as an advanced electronic dictionary with the implied function of supporting translation work, rather than conducting independent full-scale translation. It should be an excellent tool for professional translators as well as for students of the Japanese language, other than that it has a limited scope of application.

2 CASE STUDY: THE JAPANESE DATABASE AND MACHINE TRANSLATION PROJECT

2.1 THE OBJECTIVE

The practical goal of the Japanese Database and Machine Translation project at RPI was to develop an information system for collecting and processing Japanese-language information stored in Japanese-language databases, using J/E MT as a translation tool. The visionary goal was, in co-operation with Japanese database and MT system producers[25], to develop an information system for Western users demanding electronically stored

[24] A translation-table, which translates by context-independent word-matching , is of course considered more primitive.

[25] During the period 1991-1992 RPI co-operated with the Software Development Center, Hitachi, Ltd. and Hitachi Europe, Ltd., using their workstation-based J/E MT system, HICATS. The project was also supported by Japanese database producers through generous database usage agreements. The databases used were: ELNET, G-Search, JAPIO, JICST and NIKKEI. See footnote 5 for a listing of the Swedish corporate sponsors.

Japanese-language information. The visionary product was a “black box” that would help Western information professionals, with no command of the Japanese language, to search, retrieve and translate Japanese-language bibliographic database references.

2.2 THE APPROACH

The source text material that the Group conducted its MT experiments on consisted of Japanese database references. These database references where retrieved at RPI in accordance with search profiles pre-defined by the sponsoring companies[26]. The topics of these search profiles where mainly in the technology field.

The Group developed an automatic text-formatting program to pre-edit the references prior to MT[27]. After the MT cycle was completed, excluding post-editing but including dictionary maintenance, the translated text was evaluated according to the criteria specified below. The reason no post-editing occurred was quite simple: a user with no command of Japanese cannot perform post-editing. Of course, this meant that the quality of the target text was not always very high, but since the goal was not perfect translations, this did not matter. It was enough if the user could judge the relevance and value of the reference, and from this evaluation, decide whether or not to retrieve the article in full-text.

The criteria for a good translation was: (1) a rough, but understandable translation of the title, (2) a perfect translation of the source data, and (3) a perfect translation of the keywords. It should be noted that MT of full-text articles was not considered an option, it was understood that full-text material should be handled by professional translators.

---

[26] The Japanese database and MT research was conducted at RPI during the period 1985-1992. The sponsors were: ABB Fläkt AB, AGA AB, Bofors AB, CelsiusTech Systems AB, DFI, Electrolux AB, Ericsson, Esselte, and SKF.

[27] The formatting-program was developed in a UNIX environment by Anders Bensryd, analyst at Kockum Computer Systems, Malmö, Sweden, on a free-lance basis.

2.3 THE RESULTS

In brief, the RPI Group demonstrated that it is possible to develop a Japanese information retrieval system using state-of-the-art MT as a practical translation tool. As is true of many other software systems though, the MT system had to be customised to function effectively in the service it was set to perform, in this case, the translation of bibliographic database references.

One interesting outcome from the RPI project was that technical references translated better than those from “softer” disciplines, i.e. social sciences, including business, and humanities. It was also recognised at an early point, that a major determining factor influencing the performance of the MT system, was the set-up and maintenance of the inherent electronic dictionaries. This point cannot be overly stressed: poor dictionary facilities/ maintenance = poor/useless translations. A problem that hampered the development of the automatic text-formatting program was the different format standards utilised by Japanese database producers. Consequently, the formatting program had to be adapted for each individual database.

3 WHAT DOES THE FUTURE HOLD?

3.1 MT TECHNOLOGY

It was in the US that the first attempts to machine translate were made soon after the second world war, and in the mid-1950s to mid-1960s many other countries including Japan also started experimenting with the technology [7]. After a slack period during the seventies, interest in Japan stepped-up again in the beginning of the eighties. One of the leading figures on the Japanese MT scene, then and now, is Prof. Nagao at the Kyoto University. According to Prof. Nagao, we may in the future see the merging of the two now dominant frameworks for building MT systems, rule-based MT (RBMT) and example-based MT (EBMT) [3]. The former is structured on a knowledge base of rules for analysing sentence structures and meanings, whereas the latter uses a database of examples (e.g. pairs of sample phrases, sentences or texts and their translations) as knowledge base [8].

Prof. Nagao withholds that none of these frameworks function well enough individually, and that an integration of the two would probably be more successful, and could in the long run lead to a breakthrough in the development of an advanced MT system [9]. At IJET-5 in 1994, the only international conference for translators of Japanese to English, Prof. Nagao was reported to have said that a team of researchers at Kyoto University will have a prototype MT system ready by the year 2000 [10], perhaps this will be the first functioning J/E-RBMT/EBMT system!

3.2 MT APPLICATIONS

An essential determining factor when designing MT applications, and systems too for that matter, should be a deep and firm understanding of the potential MT end-user needs. In order for a MT system to be practicable and commercially viable, it must first of all be *customisable*. Other important factors are of course pricing, quality and speed of translation, system compatibility, etc., but none of these really count if the system cannot be customised to meet specific end-user needs.

Today, you can access MT services via computer networks, through on-line databases, installed on desk-top and on lap-top computers, in other words, accessibility is not a problem. So, the future of MT systems and MT applications is not limited by accessibility, nor by the lack of locations where it can be successfully applied, rather, the future rests on the ability of MT researchers to develop an open and mouldable MT system that is reasonably priced with satisfactory quality and speed of translation.

REFERENCES

1. M. Tallving and P. Nelson, Japanese databases and machine translation: a question of international accessibility to Japanese databases, Proceedings Online Information 90: London, p. 423 - 437.

2. P. Nelson, Breaching the language barrier: experimentation with Japanese to English machine translation, Proceedings Online Information 91: London, p. 21 - 33.

3 M. Tallving and P. Nelson, Japan 1991. Japanese databases & machine translation. Notes on recent trends and developments in the Japanese database and machine translation industry, unpublished trip report, Research Policy Institute, 1991: Lund, Sweden.

4 P. Nelson, J. Sigurdson and M. Tallving, Japanese information retrieval in Europe. Final project report for Internationalization of Japanese Databases: Productive interaction between producers and users, unpublished project report, Research Policy Institute 1992: Lund, Sweden.

5 M. Tallving, Japanska språket och maskinöversättning, (The Japanese language and machine translation), The Nordic Journal of Documentation, Vol. 49, 1994:1/2, p. 49 - 55.

6 Automatic translation approaching reality. Some success achieved, but systems still have serious limitations, The Nikkei Weekly, Feb. 22, 1993, p. 10.

7 Machines that translate, but not perfectly, The Daily Yomiuri, Sep. 14, 1994, p. 12.

8 E. Sumita and H. Iida, Experiments and prospects of example-based machine translation, ATR Interpreting Telephony Research Laboratories, Kyoto, Japan. (Publication and publication date unknown.)

9 Translation system sidesteps grammar. IBM Japan uses database of sample sentences to translate Japanese-English technical writing, The Nikkei Weekly, Aug. 2, 1993, p. 12.

10 J/E translators touch base at May conference, The Japan Times, Jun. 24, 1994. (Page unknown.)

JICST MACHINE TRANSLATION SYSTEM

Ms. Yoshiko Shirokizawa, Chief information officer
Japan Information Center of Science and Technology
Tokyo, Japan

Abstract

JICST's machine translation system from Japanese to English for a main frame was brought on line for use in the production of the JICST-E file in 1990. We began working on adaptation of this system for workstations and PCs in 1994. The PC version which runs on Macintosh PCs has new functions such as conversational processing and a user dictionary and features a more user friendly interface.

1 INTRODUCTION

The JICST machine translation system (JMT) translates from Japanese to English. It is based on the Mu system, which was developed with support from the Science and Technology Agency between 1982 and 1986 to facilitate the transfer of scientific and technical information from Japan to foreign countries. JICST was one of the participants in this project.

Further development was undertaken by JICST between 1986 and 1991 to provide for the translation of large bodies of scientific and technical literature, and the main frame version was brought on line in 1990. Since that time, while operating JMT, we have continued to add grammatical rules and update the translation dictionary.

At present, the system is used to translate titles and abstracts from science and technology papers published in Japan. The average annual production has been about 70,000 titles and 15,000 abstracts, and the projected production for 1995 is 94,000 titles and 38,000 abstracts. English titles and abstracts from JMT are accumulated in our JICST-E file, which is accessible through STN International and JOIS.

Last year, we began adapting JMT for workstations and for PCs. I will present an outline of the system and features of the PC versions, along with plans for future development.

2 DEVELOPMENT GOALS FOR PC VERSION OF JMT

Due to memory limitations, the main frame version of JMT cannot translate long sentences (the current limit is about 150 characters), and addition of new words to the dictionary and new rules to the grammar is increasingly difficult. Development of the workstation version of JMT will mitigate these problems. Since the processing speed of the workstation is about 3 times that of the main frame, the speed of the translation process will also be drastically improved. Use of the main frame for JICST-E production will eventually be phased out in favor of the workstation version of JMT.

The current PC version runs on Macintosh PCs. Users without access to the workstation version through e-mail or JICST's Local Area Network can still translate papers written in Japanese using the PC version. We are developing a Windows version of JMT which should be available by the end of the summer.

3 CHARACTERISTICS OF PC VERSION

The PC version is based on the workstation version. It has the same dictionary as the workstation version with about 600 thousand entries, but its user dictionary functions are more limited, since PCs have less memory and disk space than workstations. The PC dictionary is distributed on CD-ROM and the system is distributed on floppy disks.

New functions of the workstation version are as follows:

1) Graphical user interface

The main frame version employs a keyboard command user interface. The PC version operates with a more user friendly graphical interface, allowing

translations to be executed under the control of a mouse or other pointing device. A translation can thus be executed by simply clicking on the appropriate function button.

2) Conversational processing

With interactive processing, users can carry out translations and modify their input sentences after seeing the corresponding output. The input sentences can thus be modified and resubmitted for translation without the delay.

3) User dictionary

The PC version allows users to create their own customized dictionary, to be used in place of the system dictionary. This user dictionary may include words not found in the system dictionary, or exclude equivalents found to be unsuitable. Additions to the user dictionary may be made interactively, and used immediately in subsequent translations.

4) Translation of general documents

JMT was originally designed to translate scientific and technical articles. In the PC version, however, users are given a choice of styles for translating general documents.

For example, if there is no subject in an input sentence, the first person pronoun ("I") may be selected as the subject for the English output. Other alternatives include designating "It" as the subject, or translating into passive voice or an imperative sentence.

4 EXAMPLES OF USE

The general sequence of use JMT is as follows:

(1) A Japanese text file is opened.
(2) Machine translation is carried out on Japanese sentences.
(3) The raw machine translated English sentences are again proofread.
(4) Translated sentences are printed.
(5) Translated sentences are saved into files.

Japanese articles to be translated must first be made machine-readable, e.g. by means of a scanner and Optical Character Readers software. Users can then translate Japanese into English with JMT.

5 FUTURE DEVELOPMENT

The workstation version of JMT should be available by October for production of JICST-E. Additional products and services being considered for future development are as follows:

1) A network machine translation service will be made available to users worldwide over Internet by this winter. Using scanner and Optical Character Reader software, e.g. Japanese articles can be made machine-readable and sent by e-mail to JICST. JMT system will check automatically the input mail box at regular intervals, translate the input sentences, and send output sentences by e-mail. This service will greatly facilitate the translation of scientific and technical papers by Japanese researchers into English.

2) The PC version currently available is for Macintosh PCs, but a Windows version, that will run on various other PCs, is under development. The PC versions will be used only within JICST. At present we do not plan to make the system software itself available to the general public.

3) In addition to its JICST-E file, JICST also maintains a much larger database of Japanese titles and abstracts in Japanese, accessible through the JICST On-line Information System (JOIS). If MT processing could be made

a built-in JOIS utility, Japanese sentences could be translated into English on line, allowing users to retrieve Japanese articles and view the output in English. Obviously, such a service would greatly facilitate access by English speaking researchers to Japanese scientific and technological information. We would like to investigate the possibility of providing such a service.

Because such an enormous grammar and dictionary are needed for the current system, structuring and development requires significant effort. Our long range plans are to develop an example-based machine translation system that will produce translated sentences of better quality by referring to numerous translated examples.

OFFER OF SERVICES ON JAPANESE INFORMATION FROM 1985 TO 1995

Ms. Hélène Haon, Manager for Japan and Far East
Responsable Bureau Japon,
Centre de Documentation de l'Armement (CEDOCAR)
Paris, France

Abstract

This publication gives a description of the different services afforded by a unit specialised in Japanese Information e.g.: databases, document supply, inquiries, publications, and the use of new technologies such as machine translation, bibliometry, CD Rom and Internet.

1 INTRODUCTION

In 1985, at the CNRS was started the "Japan Unit", this small unit was described as an experimental structure, very new in its conception. The first reason this unit was created was to give access to the JOIS database - a database about Japanese science and technology - and that was quite revolutionary at that time. But the database was in Japanese so specialists on Japan were needed and little by little, others products were created. After one or two years, the services of the structure were running quite well, and we could offer proper services to our customers.

Looking back, with a certain nostalgia, to those days, I have the feeling that two things have evolved. The variety of the sources and a better knowledge about Japan bye customers.

As some of you can remember I made a presentation of the activities of the Japan unit in CNRS at the First International Conference on Japanese Information at Warwick in 1987 (1). So, today I will follow the same "plan", and will make comments about the evolution of each type of product.

2 DIFFERENT SERVICES

2.1 DATABASES

As far as the scientific and technical information was concerned, in early 1985 we had only JOIS, then we had HINET (in Japanese language again !), then we had NIKKEI (in English !), and later JICST (E) (in English). Anyway, whatever we were offering to the customers, they were just claiming us that the Japanese information was totally inaccessible. So at that time the role of the specialists was to prove that access was possible, in doing all the interrogations himself most of the time. Ten years later, in the bureau Japon of CEDOCAR, we are a small team considered as specialist in interrogation on Japanese databases. But the work is totally different. Most of the time, when we work on a special subject, we are not using one database, but playing on different complement databases. So we have to know very deeply the possibilities of the different databases. More than that, in the Japanese databases we are looking not only for information about Japan, but also very often for information on different countries in Asia.

Finally, as the number of Japanese databases in English has rapidly grown, access has become more and more easier on international hosts, one of our very important roles is to help people to know which type of database (or information) their are able to reach easily by themselves (3).

Our very strange observation, is that the users of database, most of the time, will not take the "risk", to adventure themselves, in the files of a Japanese database, even if the Japanese databases are loaded on a host he knows very well. This is why, we have made a long investigation to determine exactly what is accessible in English on international hosts.

Results are as follow:

File	Productor Distributor	Content of the base
Asahi Shimbun Online Database	**NEXIS - FT-PROFILE COM-NET - MAID**	Integral text of articles distributed to foreign news agencies by the Asahi News Service.
COMLINE Business Analysis (CBA)	**COM-NET**	Over 2000 analyses of technological developments in Japan. Contains parts of the Comline Daily News.
COMLINE Daily News: Biotechnology and Medical Technology	**NEWSNET - NEXIS MAID - COMLINE - LEXIS**	Journals and publications on biotechnology in Japan.
COMLINE Daily News: Chemical and Materials	**NEWSNET - NEWIS MAID - COMLINE - LEXIS**	Journals and publications on the chemical industry in Japan.
COMLINE Daily News: Computers	**NEWSNET - NEWIS MAID - COMLINE - LEXIS**	Journals and publications on the computer industry in Japan.
COMLINE Daily News: Electronics	**NEWSNET - NEWIS MAID - COMLINE - LEXIS**	Journals and publications on the electronics industry in Japan.
COMLINE Daily News: Industrial Automation	**NEWSNET - NEXIS MAID - COMLINE - LEXIS**	Information on moulding, factory automation, CADCAM, as well as news on companies in the field.
COMLINE Daily News: Telecommunications	**NEWSNET - NEXIS MAID - COMLINE - LEXIS**	Journals and publications on the telecommunications industry in Japan.
COMLINE Daily News: Transportation	**NEWSNET - NEXIS MAID - COMLINE - LEXIS**	Journals and publications on the transport industry in Japan.
COMLINE Industrial Monitor (CIM)	**COM-NET**	67,000 articles on new technologies in Japan. Contains parts of the Comline Daily News.
COMLINE Japan News Service (JPNEWS)	**DATA-STAR - STN GE INFORMATION SERVICE - DATA TIMES CORP. - ASAP - DIALOG**	Overall base for the 7 files of Comline Daily News and Tokyo Financial Newswire.
COMLINE Japanese Corporate Directory	**DATA-STAR NEXIS**	Financial and business descriptions for over 5,000 public and private Japanese companies.
COSMO 2	**COSMONET**	Financial and business descriptions for over 950,000 Japanese companies. Corresponds in part to the Teikoku Bank & Company Yearbook.
Digitized Information	**MAID COM-NET**	Complete text of articles on the latest developments of new technology in Japan.
Fujitsu Weekly	**DIALOG**	Activities of Fujitsu (Japanese press): new products, technologies, joint ventures, production.
Hitachi Weekly	**DIALOG**	Activities of Hitachi (source: Japanese press): new products, technologies, joint ventures, production.

IBM Japan Weekly	**DIALOG**	Activities of IBM Japan (Japanese press): new products, technologies, joint ventures, production.
Japanese Government and Public Research in Progres (JGRIP)	**STN** **JOIS**	Over 20,000 Japanese technical and scientific research projects carried out in over 600 Japanese public or private centres.
Japanese Government Weekly	**DIALOG**	Activities of the Japanese government (Japanese press): import/export policy, standards, public/private relations, etc.
JAPIO	**ORBIT - DIALOG QUESTEL**	All patent registrations in Japan. Bibliographic notices.
JICST-E	**STN** **JOIS**	All Japanese scientific publications indexed on the Japanese JOIS bases.
Jiji Press Ticker Service	**NEWSNET - NEXIS MAID - LEXIS - DIALOG**	Contains general, financial and industrial information distributed by Jiji Press on Japan.
Jiji Securities Data Service	**GE INFORMATION SERVICE**	Information on the Tokyo , Osaka and New York Stock & Bond Exchange.
KIKAKU NET	**JIPNET** **NEEDS**	8,000 official Japanese standards, 5,000 domestic Japanese standards, 200,000 foreign standards.
Kyodo News Service	**NEWSNET - DATA-STAR** **MAID**	Full text of articles transmitted by the Kyodo News Service. Covers Japanese news.
Matsushita Weekly	**DIALOG**	Activities of Matsushita (Japanese press): new products, technologies, joint ventures, production.
Mitsubishi Weekly	**DIALOG**	Activities of Mitsubishi (Japanese press): new products, technologies, joint ventures, production.
NEC Weekly	**DIALOG**	Activities of NEC (Japanese press): new products, technologies, joint ventures, production.
NEEDS-ADB	**NEEDS**	Contains data on Japanese regions, regional economic activity in the 47 local districts of Japan.
NEEDS-AG	**NEEDS**	1500 references covering agriculture, fishing and forestry in Japan.
NEEDS-COMMODITY	**NEEDS**	Data on the commodities market.
NEEDS-COMPANY	**NEEDS**	17,000 major public and private companies in Japan : 4 files: financial, business, economic and historical information.
NEEDS-ECONOMY	**NEEDS**	Macro-economic data on Japan, covering the balance of payments, finances, employment, international trade, industrial production, etc.
NEEDS-ENERGY	**NEEDS**	Energy resources in Japan (oil, electricity, coal, gas).
NEEDS-SCAN	**NEEDS**	Details of sales of 20,000 consumer products sold in Japan.

Nikkei English News	**NEEDS REUTERS, LTD...**	Economic, financial and business news affecting Japan.
Nikkei Financial File	**NEEDS**	Information on Japanese companies (production costs, financial relations, etc.).
Nikkei Stock and Bond Price File	**NEEDS**	Japanese Stock & Bonds.
Nikkei Telecom II Japan Financial News and Data	**NIKKEI TELECOM**	Political, economic, financial and technological information on Japan.
Nikkei Weekly	**NEEDS - NEXIS - MAID**	Complete text of the Japanese economic and industrial journal, "The Nikkei Weekly".
Nomura Research Database	**QUOTRON SYSTEM**	Information on over 1,000 companies listed on the Tokyo Stock Exchange (financial data, sales, profits, projections, investments, etc).
NRI/E Japan Economic & Business Databank	**The WEFA Group**	Economy and business in Japan. Contains general and industrial national statistics.
Repports of the YANO Research Institute	**MAID**	Reports of the YANO research institute. Covers the agro-food field.
TEIKOKU Databank: Japanese Company	**DIALOG - NEEDS COSMONET**	Financial and business descriptions for 186,000 Japanese companies.
The Mainichi Shimbun	**MAID**	Full text of the general Japanese daily "Mainichi Shimbun".
The Nikkei Economic Daily	**MAID**	Daily editions of the "Nihon Keizai Shimbun".
The Nikkei Financial Daily	**MAID**	Publications of the Nikkei Group.
The Nikkei Industrial Daily	**MAID**	Daily editions of the "Nihon Sangyo Shimbun".
The Yomiuri Shimbun	**MAID**	Full text of the general Japanese journal "Yomiuri Shimbun".
Tokyo Financial Wire	**NEWSNET - NEXIS - MAID - COM-NET - COMLINE - LEXIS**	Articles on the economy, finance, industry and companies in Japan. Covers the Tokyo Bond & Stock Exchange.

2.2 DOCUMENT SUPPLY

For document supply, for most of the publications I think I can say that the two main sources remain, the British Library in Europe, and the JICST in Japan, where we can find an evolution is in the greater knowledge and curiosity of the customer. And we have been lead to offer them pamphlets on companies or research centers, white papers or other specialized publications not referenced in databases. This is a continuous work for us in the Bureau Japon to be aware of the latest publications or possible sources

that make us able to draw the attention of customers to things in his field he should order.

2.3 ENQUIRIES

As literature in english is spreading questions are more acurate and comprehensive, or more adapted to the specifications of Japan. So we need less energy to put our enquiry in good shape, working with the customer.

To finish with this, I would like to remark that, the more a subject is fashionable and you will find articles everywhere, the less we will get questions about it. Which is a pity, because we generally would be able to give much more interesting informations.

2.4 PUBLICATIONS

In 1987, in CNRS Japan Unit, we had different publications about robotics, aeronautics and so on. These publications were based on thematic database interrogations and press releases. In fact these publications were made to keep people aware of our existence and our capacities. I think there are enough publications now about japanese scientific and technical information. If a publication should be done by such a small unit as the Bureau Japon it should be a list of publications (sort of a News Letter) made by non japanese organisations like ambassies, ministries ect...

2.5 UTILISATION OF NEW TECHNOLOGIES

With the great number of japanese databases accessible in english, the utilisation of these means of dealing with the information is the more important change. And even if we are at an experimental stage at the moment for most of them, I am sure these techniques will be very common for us in one year or two.

Machine Translation: The language has always been the most important barrier to japanese information. So, in 1994, the Bureau Japon has acquired

of a NEC MT system. With this acquisition the idea is to inform the users about the general content of publications. In fact, it was too often that we had interesting results of an interrogation on JICST(E) and the customers were disappointed to know all the texts where in japanese. Now we can afford a complementary service.

Bibliometry: It might also happen that the quantity of documents is so important that the exploitation is very difficult. With the result of a long interrogation on JICST(E) for instance, what can we do with 150 references? The bibliometry will let you know, the more productive author, his connection with others research centers... We have done this several times on JICST (E) (2), and we are now prepared to do it on JOIS (4).

This work has been performed in collaboration with the University of Marne - la - Vallée (Pr. Paoli) and the University of Aix-Marseille (Pr. Dou). The bibliometry system is the Atlas Platform.

CD Rom: This is a new way of acquiring information we have not utilised yet. In fact, up to now, when we have found CD Rom we were interested in, these CD Rom concerning a very specialised subject (for instance new materias) needed special "CD Rom reader", and as the acquisition of differents "readers" was not possible we had to postpone the utilisation of this source.

Internet: Nowadays, the words "information highway" is everywhere, I don't know if we can really have a highway between Europe and Japan, but no doubt the knowledge and utilisation of Internet will greatly change the landscape of the offered services. And this might be again a time when only a specialist can make the interrogations.

3 CONCLUSION

As a conclusion, I just want to say that if the possibilities of access to japanese information has really improved in ten years, I think that the utilisation by customers of this information is far less than it should be. So in spite of the effort of the Japanese side the europeans are still under informed about Japan.

BIBLIOGRAPHY

1) 1st International Conference on Japanese Information, The British Library Japanese information Service, London, septembre 1987.

2nd International Conference on Japanese Information in science, technology and commerce. D. Mûnch et al., IOS Press, Amsterdam, Washington DC, Tokyo, 1990.

3rd International Conference on Japanese Information in science, technology and commerce. INIST - CNRS, Vandoeuvre les Nancy, Mai 1991.

2) Perception d'un programme de R et D à travers l'analyse bibliométrique des banques de données d'origine Japonaise. H. Haon, C. Paoli, H. Rostaing. Texte des communications Paris IDT 93. Pp. 63 - 70.

3) Acquisition and analysis of Japanese online Information. H. Haon, H. Dou, J.-M. Dou, CODATA, Chambery, 1994.

4) Bibliometry on Japanese Databases. H. Haon, J.-L. Emeric. 4th International Conference on Japanese Information in science, technology and commerce. University of Newcastle. Septembre 1995. (Under printing).

DOING SUCCESSFUL BUSINESS IN JAPAN

Mr. Ilpo Kaislaniemi, Trade Commissioner
Consulate General of Finland
Shanghai, P. R. China

Abstract

The business in Japan is considered to be very difficult for foreign companies. It is not very easy for the Japanese companies either. The big and powerful keiretsu industrial groups tend to do business among the group. However, there are also foreign success stories in Japan.

THE BUSINESS IS LIKE THE SUMO WRESTLING

The business in Japan is like the Sumo wrestling: It starts from the bottom, all the participants are equal, and only the best can win. There is no classification in Sumo according to the age, weight, height or similar features. The only thing that matters is the ability to win, the skills to manage to be better than your opponent.

In the similar way the companies in Japan are equal. All of them must fight their way through the bureaucracy, all must use the usually very complicated, several-tier distribution system. Somehow the companies must prove that they manufacture good quality products, and can sustain that quality.

The foreign companies and the Japanese companies are in this sense equal. However, the Japanese companies tend to have at least the language advantage in Japan.

In the business and in the Sumo, the path is not all roses. Sometimes your opponent is tricky, even though he never does illegal things. Sometimes you get sick, and loose, and perhaps must stay out of a tournament or two. And sometimes you face the situation that your younger opponents keep winning every time, and you decide to retire.

There is a difference between a matured company and old Sumo wrestler. When getting older, a company is gaining experience, and developing skills to serve the customers even better year by year. A Sumo wrestler, however, must hung up his mawashi (belt), and retire.

The reason I wanted to take up the comparison between Sumo and business is to emphasise the fact that business in Japan is very difficult also for the domestic companies. Japan is not an easy place for foreign companies or businessmen. But there are no basic differences in the Japanese law for foreign and Japanese companies. The initial investment is subject to the Foreign Exchange Control Law, but that's about it. When established, a "foreign" company becomes Japanese.

SUCCESS IN SUMO AND BUSINESS

The Sumo is usually dominated by Japanese, but lately some foreigners have done pretty well in it. An example is the Hawaiian-American Akebono, who is one of the two present Yokozuna (Grand Champion).

Also several foreign companies have been very successful in Japan, like IBM, Coca Cola, McDonald's, TI, Apple, Seven-Eleven, and the like. There seems to be no rule like which type of companies can be successful in Japan, and which cannot. The fact is that many foreigners think that Japan is a very difficult market to enter, operate, and make money.

In the next paragraphs I will try to describe some features of the Japanese way of doing business, like Keiretsu and the way of thinking. Also I will try to analyse some drivers to make successful foreign business in Japan.

KEIRETSU

In the feudalistic Japan a village was the unit of the society. A village was very hierarchic, consisting of the ruling samurai class, then peasants, craftsmen, and merchants. The samurais were not only warriors, but also administrators. Peasants provided all other village people with food, and the small number or craftsmen did their job, which included art objects,

temples, and houses for the samurais. The merchants were latecomers, and their low position emphasises the self-sufficiency of the village; the traders were not needed. The village provided its people with the basic things for living: food, shelter, protection, social life, and culture. The classes needed each other, and there is good reasons to believe that those people had a reasonable good and happy life. The Japanese society remained closed from outside relations for more than 200 years.

But then Admiral Perry arrived with his black ships in 1853, and by the power of guns demanded the country to open up. The Shogunate was cancelled a bit later, and the Emperor restored. During the so called Meiji Restoration, people were sent abroad to learn new things, and to bring technology, knowledge and new skills with them to Japan. The class system was also eliminated, and the election system was introduced. Gradually the rural Japan was turned into an industrial country.

But what happened to people? They used to live in villages, and got all their needs serviced against their own work. In the changing situation, the emerging companies took over the role of the villages. The companies provided the employees with housing, shops, schools, places for studying, hobbies, everything. Even the spouse was usually found within the company.

The system of life-time employment has been followed by the large companies only. However, also the government offices and smaller companies have been adopted the similar practice.

Most famous of the keiretsu, like Mitsubishi, Mitsui and Sumitomo, are very old. They date back some 300 to 400 years of industrial operation. However, the modern form of keiretsu was developed during this century.

A keiretsu is a group of companies, in case of the larger groups some 150 legal units. The keiretsu companies own each other’s shares, and tend to do most of their business with other group companies. In many case a bank or a trading house is the core keiretsu company. Several of the companies can be listed ones, in which case most of the shares are owned by other companies, private persons, institutions and the like. But the voting power is

surely and steadily in the hands of the other keiretsu companies. One single shareholders usually keeps no more than 2 - 4 % of the shares.

The Japanese like the long-term relationship and harmony in all what they do. There is nothing to wonder about the fact that the keiretsu companies prefer doing business with each others. A company purchases components from another keiretsu company, and sells the final products to other group members. A trading company takes care of exports, and the keiretsu bank is financing the operations. Of course there is an insurance company to use, a keiretsu resort area to spend the vacations, and a discount to purchase car from a fellow automobile company. The keiretsus have close relationship with some universities, which provide them annually with new graduates. They also must keep good relations with the related government organisations, accepting from time to time an “amakudari” (a gift from heaven), which means a company is employing a retired bureaucrat as an adviser.

This system does not easily accept an outsider to enter; this is true for both foreign and domestic new entrants. It can help if the newcomer is able to “join the team”.

THE WAY OF THE JAPANESE BUSINESS

The western way of the decision making system is that of the majority-wins. This is often said to be based on the behaviour of the ancient wandering cattle-herding tribes. The most important decision was to decide which way the moving tribe should choose next, where to find grass and hunting grounds to survive over the winter. Usually the minority agreed what the majority decided. It would have been difficult for a smaller group to survive alone.

The Japanese villages were cultivating rice, in which the most important decisions are how to distribute the irrigation water, and how to agree about the cooperation in planting and harvesting. One single family could not cultivate enough rice for their own survival, but 12 families could, in cooperation, grow so much rice that they could sell half of it.

It is typical for the Japanese decision making that long time is used for preliminary discussions, gathering the facts, and planning each and every minor detail of operations in advance. This guarantees usually a smooth implementation of a project or production. On the other hand, the Japanese have difficulties in adjusting themselves into rapidly changing situations.

In the business, as in the society and social life, the Japanese want to promote harmony. They want to do business as it used to be, not accepting newcomers. The Japanese companies also primarily serve their customers, and the suppliers are less important. In the west we think that a company has several principals, which products it sells to customers in its operational area. In Japan , a company has several customers, to whom it sells products the customers want to have. Basically this thinking is still there, even though there has been changes along the internationalisation of the Japanese companies.

HOW TO SUCCESS WITH MY PRODUCT

Many books have been written on this subject, and, generally speaking, you can success following those advises. All the success cases do not follow the textbook, but some basic rules can be described.

The product must meet the customer’s requirements of improving performance and productivity, cutting costs, and helping the customer to serve his customers better. It is good if the product contributes to the harmony and the mutual prosperity.

The product must be world-class. The product and performance quality is a basic thing, self-clear, not a sales argument. If the product does not belong to top of the world of its kind, it is better not bring it to Japan.

The right way to sell the product in Japan should be found. There are no general rule for it, but the example below describes one possible pattern to introduce industrial goods to Japan.

Start with an agent to find out whether or not the product can be sold in Japan; remember patenting.

Make a joint venture company, to acquire personnel, and to develop the after sales service network.

Establish a wholly-owned company to take care of the technology, establish R & D unit.

Let the partner sell, and use subcontractors to produce.

Later you may take over the whole thing, or withdraw your direct investment, and continue selling through agent(s), especially if the manufacturing has been moved
into a low-cost country.

It is difficult to hire people in Japan, the quickest way can be to form a joint venture.

A long but sure way is to hire people directly from the universities, bring them to your factories, let them take a M.Sc., M.A., or MBA in a western university, and then send them back as your own people to Japan, to work for you for their lifetime.

HOW TO ENTER THE IMPORT BUSINESS

The Japan External Trade Organisation (JETRO) has prepared advise list for the Japanese companies, who want to start importing foreign goods to Japan. Since this list can help also a company wishing to export to Japan, I am giving the 10 titles below:

1) Sell new imports using pre-existing networks
2) Make sure new products meet consumer needs and market trends
3) Set your market size and goals
4) Start on small scale and expand cautiously after conducting market tests
5) Maintain good communications with your foreign supplier
6) Gather information to make the most of your in-house employees and outside personal contacts

7) The responsible person must venture into the field in search of direct sales and conduct negotiations
8) Make use of information from JETRO, embassy trade representatives, and trade offices of state governments
9) Attend product exhibitions and foreign trade missions to Japan
10) Appoint someone to keep abreast of new import business developments.

Japan is at the same time different of and similar with any other markets. As in other Asian countries, business is done between friends. Look forward to a long-term relationship, be prepared to mutual progress and problems, and remember that the customer really is the King.

HOW PRACTICAL INFORMATION LEADS TO PRACTICAL CONSEQUENSES

Mr. Asko Känsälä, Counsellor, Industry and Technology
TEKES Tokyo office
Embassy of Finland
Tokyo, Japan

Abstract

Benchmarking is becoming a more and more popular tool for the Finnish companies to systematically develop their products and processes. But finding a benchmark company might be a difficult task. This is especially true for markets like Japan where benchmarking is not well established.

The worldwide network of TEKES provides a unique way of finding partners - even for benchmarking. Two case examples will be discussed in the conference.

1 BENCHMARKING

1.1 WHAT IS BENCHMARKING

Benchmarking originates from Japan but the Japanese never realized what kind of a tool they were using. The American companies realized the power of benchmarking and they have been promoting it since 1980's. The first company to really make benchmarking methodology famous was Rank Xerox.

Benchmarking is a tool that

- helps you to understand your own processes,
- focus the process development work to critical processes,
- makes it easier to define goals for development.

Basically it is a method for defining the best ways of doing or the best processies of other organizations that could lead to success in your own organization.

Benchmarking can help you learn and learn faster than your competitors. It will help the individuals to learn, organizations to learn and to do it globally

TQM, Total Quality Management has been widely used in Japan to achieve the remarkable results in the industries. The basic idea of TQM is continuous development of products and processes. Benchmarking can be a good tool in this development work.

1.2 TYPES OF BENCHMARKING

Benchmarking is usually divided into three categories:

- strategic benchmarking,
- performance benchmarking,
- process benchmarking.

In **strategic benchmarking** you try to define various strategic choices for achieving the goals. **Performance benchmarking** is comparing the performance of products and processies to the products and processies of another company. In **process benchmarking** you not only try to compare the process performance but also to find the reasons behind the process performance differences

1.3 HOW TO FIND A BENCHMARK COMPANY

Companies to benchmark with could be internal companies, competitors, companies from your own branch of industry or the best possible company in the world. Depending on the choice each has its merits and demerits.

To benchmark with a competitor is usually a very good approach but it might be difficult to find a competitor to benchmark with. If you are looking for completely new ideas, you should not choose a company from the same industry.

Many of the best performs in an industry and best competitors came from Japan. On the other hand benchmarking is not well known in Japan. Japan

Productivity Center is considering the introduction of benchmarking in Japan.

So if you plan a benchmarking trip to Japan you need a good consultant to choose the companies and sell the idea of benchmarking. TEKES Tokyo Office can help you in finding proper companies.

2 TEKES AT YOUR SERVICE

TEKES is main source of finance in Finland for technology research and development. In 1993 TEKES supported 1908 research and technology development projects, with a total budget of FIM 1,418 million.

The Technology Development Centre TEKES offers excellent channels for technological cooperation with companies, universities and research institutes. through its offices in Finland, Europe, North-America and the Asia-Pacific region, and via its broad range of contacts, TEKES provides a unique introduction to the global technology network

The worldwide network of TEKES Technology Centres can help establish contacts between Finland and other countries on a practical, company to company or university to university level. Their basic task is to promote technological cooperation between their base country and Finland and to transfer information about new technological innovations, emerging technologies, technical standards and requirements and product specifications. The centers are also active in promoting Finnish technology and are always pleased to provide information.

The TEKES international network is backed by a national network of TEKES technology experts and a regional network of consultants. They provide a comprehensive profile of Finnish technology and a wide range of contacts within the Finnish industrial and scientific community. Their aim is to set up an efficient channel for technological cooperation between Finland and the rest of the world.

The technology programs administered by TEKES are an essential part of the Finnish innovation system. Designed to encourage technological

development in industry, they provide a good basis for basic research applied research and development work. Currently there are nearly a hundred active technology programs. These include large research-oriented, technology. based programs for individual sectors of industry, regional programs for technology implementation and programs run by consortia.

2.1 TEKES TOKYO TECHNOLOGY CENTRE

The TEKES Tokyo Technology Centre consists of four people and a secretary. Two Finnish and two Japanese technology experts, all of course with a technical and business background, are following closely and continuously the technical development in Japan and working with research institutes, universities and private companies to obtain information and to get contacts.

The aim of this technology center is to be a fast, reliable and knowledgeable organization that produces information for the needs of Finnish organizations from the relevant Japanese sources and also affects TEKES direction of financial support for technological research and development in Finland.

2.1.1 Basic services

This work includes coverage of research and development in our focus areas; information technology, manufacturing technology, process technology. The experts are participating in conferences, exhibitions, trade fairs and making study visits to government offices, research organizations and private companies. Newspapers, technical literature, data bases and Internet are some other sources of information.

2.1.2 Consultation

The TEKES Tokyo Office assists Finnish customers in various ways. Finding products, production machines, finding technology partners, helping with joint ventures are examples of the consultation services.

Our valuable personal network in Japan is a key source of information in processing the assignments.

2.1.3 Finnish Manager Training Program

This 18 month action-learning program consists of intensive language courses, a series of seminars in Japanese culture and business life, company visits and finally an in-house training period in a Japanese company.

Mr. Teuvo TUOMI from Polar-Electro Oy is participating in the Finnish Manager Training Program as the first official participant. The program is sponsored by his employer Polar-Electro Oy and Finnish Ministry of Trade and Industry.

The TEKES Tokyo Office is acting as a coordinator of this program in Japan.

2.1.4 How about the cost?

The assignments are billed according to the rules of the government of Finland. At the moment most of our assignments fall in a category of 488 FIM/hour including VAT.

HOW A TECHNICAL ATTACHÉ IN TOKYO CAN OPEN DOORS - SOME CASES FROM NORWEGIAN EXPERIENCE

Mr. Masato Kubota, Assistant Attaché
Norwegian Industry Attachés Tokyo Office
National Institute of Technology, Norway
Tokyo, Japan

Abstract

Norwegian Industry Attachés (NIA) was established in 1984 under the initiative of the Norwegian government with an aim to support the home industry in obtaining business and technology information from major industrialized nations and in implementing technology transfer. This paper is to show how a technical attaché at NIA Tokyo office can assist Norwegian companies in these respects. By considering some typical cases NIA Tokyo office has dealt with, the author attempts to discuss implications for Nordic companies contemplating technology transfer or global partnership with Japanese companies.

1 INTRODUCTION

Following Sweden and Finland, Norway set up its Industry Attaché System, named Norwegian Industry Attachés (NIA), in 1984. It was established under the initiative of the Norwegian government with an aim to support the home industry in obtaining business and technology information from major industrialized nations, which is becoming vital for any business to stay competitive, and in implementing technology transfer. NIA opened its technical attaché office in Tokyo in 1985, as the third of its kind after San Francisco and Paris. Today NIA has offices in London and Stuttgart as well. Two or three technical attachés are stationed at each office to answer inquiries from the home industry. As in Sweden (STATT) and Finland (TEKES), NLA reports to its home organization, the National Institute of Technology (TI).

In this paper, first, I would like to glance at the Norwegian industry and its perspective toward Japan. Secondly, I will elaborate on the motivation of

those Norwegian companies who are interested in Japan. Thirdly, I will describe how we attempt to serve their needs. Fourthly, I will illustrate endeavors made by the Norwegian companies by presenting some typical cases from our experiences for the last ten years. Finally, I will briefly discuss what those cases suggest: i.e., implications for Nordic companies contemplating technology transfer or global partnership with Japanese companies.

Technology transfer is a term whose definition is at times rather vague. To make my discussion clear, I would like to define it as 'any business-oriented interaction which involves: (1) inter-organizational transfer of knowledge (and skills) in the form of product, service, patent, know-how, or capital investment; or (2) creation of knowledge (and business) by combining existing ones possessed by the two or more parties concerned'. In a broader sense, I would like to include the following as a mode of technology transfer; i.e. 'transfer of knowledge based on public information on business and technology, without making business-oriented interaction with the counterparts'. Meanwhile, a term global partnership is used in this paper to distinguish those business-oriented interaction which stresses on the latter aspect of the definition of technology transfer in the context of global business development. By defining thus I would like to stress that: (1) we should be aware of the diversity of the mechanism on how transfer/creation of knowledge occurs on everyday business; and therefore (2) we should not neglect the importance of supporting those inquiries which are not likely to result in a narrow definition of technology transfer, such as licensing, which accompany formal agreements and counter values.

2 A GLANCE AT THE NORWEGIAN INDUSTRY AND ITS PERSPECTIVE TOWARD JAPAN

There are about 11,000 industrial companies in Norway [1]. The Norwegian industry consists of just a handful of large corporations, and the remaining majority of smaller firms with less than 100 employees. One statistics indicates 95 % of Norwegian companies fall into the latter, and as much as 8096 have less than 20 employees [2].

The Norwegian industry has been highly developed around hydro electric power, shipping and offshore activities, which have formed competitive

clusters of companies [3]. The industry has undergone a deliberate change, and a number of venture companies are also emerging in these clusters as well as in other domains, with making a lever out of advanced technologies of top international standards and unique business concepts. Such emerging companies are with potentials to renovate existing industries, or to create industries for the future.

For many of Norwegian companies, it is natural that developing business in the context of Europe has been of their top priority, as European countries as a whole represents by far the largest trading partner of Norway. Yet, a growing number of companies, regardless of their size, seem to acquire more global perspectives in their pursuit of core competence, with an understanding that any firm hoping to establish a leadership rob will have to collaborate and learn from leading-edge customers, technology providers, and suppliers, wherever they are located [4]. In these respects, Japan plays an important rob. Therefore, Norwegian companies are looking into Japan more spontaneously than ever, in spite of the geographical, economic and cultural distance. Moreover, it is a recent phenomenon that a growing interest is attached to looking at Japan not alone but in the context of East Asia or the Pacific rim as the region which represents a growth center of the world economy for the time being.

3 MOTIVATION OF NORWEGIAN COMPANIES FOR USING A TECHNICAL ATTACHÉ IN TOKYO

Our technical Attaché office in Tokyo receives about 60 to 80 inquiries annually from Norwegian organizations, concerning Japanese technology and business. Roughly speaking, 30 % of those inquiries are from small firms with less than 100 employees, 40 % are from larger companies, 20 % are from research foundations and universities, and the remaining 10 % are from regional and central governments as well as other non-profit organizations.

A majority of those companies which inquire to our office do not have any business set-up in Japan. A few of them, who have business partners in Japan, still require our assistance in view of the neutral and official nature of our office as part of the Norwegian Embassy in Tokyo.

We must be aware that technology transfer and global partnership are means for a company to achieve its individual business objectives more effectively than trying to achieve those all by itself. Then, what could be the motivations of Norwegian companies for contemplating technology transfer or global partnership by using a technical attaché in Tokyo? They can be broadly categorized into the following:

1. Seeking valuable input from Japan, which should be reflected on R&D and business planning. At this stage, a company usually has no intention to establish business-oriented contacts with Japanese companies. This may lead to initiating a goal-seeking project toward Japan in the future.
2. Seeking technological solutions in Japan, which will meet a company's present or potential needs in the development of competitive products/services.
3. Seeking opportunities in Japan based on the competence a company possesses. (Our office provides indirect aid in this respect, for instance, by obtaining Japanese technical approval of products or processes.)
4. Seeking new product or business development in a global scale through the establishment of global partnership with Japanese companies from an early stage of business planning.
5. Others.

The distribution among the five categories of the nearly 240 inquiries we have received since 1992 to date is as follows:

1. Seeking valuable input from Japan	60 %
2. Seeking technological solutions in Japan	12 %
3. Seeking opportunities in Japan	16 %
4. Seeking global business development with Japanese partners	10 %
5. Others	2 %
Total	100 %

To take a closer look at global partnership, from smaller firms' viewpoint, incentives especially for such collaboration are summarized as follows [5]:

Smaller firms may

- gain legitimacy through their association with established corporations
- establish presence in a market and develop links to distribution channels through their association with a large firm
- gain immediate access to needed resources
- diversify their risk and handle uncertainty through alliances with other firms
- obtain additional patent protection through their alliances with larger firms.

4 HOW WE SERVE THE NORWEGIAN COMPANIES

We serve the Norwegian companies on an individual project basis. The development of a project is rather simple: It is initiated upon an inquiry from a company. We reply with a proposal for assistance based on the findings from our pre-research. A project is launched upon an approval by the company. Typical forms of our assistance include

- conducting technology and partner surveys
- forwarding newsletters on a regular basis
- arranging technical visits to Japan
- assistance in holding seminars and participating in expo in Japan
- acting as an intermediary in establishing business contacts
- finding standards and regulatory conditions in Japan and helping the company to make applications for certificates
- accommodating a trainee dispatched from a Norwegian company for a period of 6 - 18 months, by providing office space and professional assistance.

Our service can take shape of either practical assistance in action or reports. Such reports may lay stress on factual information or on evaluation and advice, depending on the nature of an individual inquiry. A project is often proposed in several steps. By evaluating a report produced at each step, a company decides whether or not to proceed with the project. Each step of a project usually lasts 1 - 3 months. A successful project that has

gone through several steps may last as long as one year or longer before bearing fruit. Even after the completion of a project, we try to keep our eyes on the matter so that we could report to the company when we come across a piece of information relevant to their needs and interests.

5 FOUR CASES FROM NORWEGIAN EXPERIENCE

I would like to introduce four cases to illustrate a variety of motivation of the home industry and how we could assist them in opening doors. The first two cases represent successful business interaction as it was aimed initially. The third case has shown unexpected progress from the original intention over years. The fourth case is chosen as it represents a new trend of strategy that a company seeks product and business development through the establishment of global partnership from an early stage of business planning, although the project was suspended. (Note: Operating revenues and number of employees in parentheses are as of 1993.)

5.1 OBTAINING EXPLOSION-PROOF CERTIFICATES FROM THE JAPANESE AUTHORITY - A CASE OF ABB FLEXIBLE AUTOMATION A/S

ABB Flexible Automation A/S (operating revenue of NOK 150 mil.; 140 employees) is a world-leading manufacture of industrial painting robots. This company made a decision to put increasing efforts to develop business in Japan as it represents one of the largest and most competitive markets in the world. Since painting robots are operated in hazardous environment, it was prerequisite for the company to obtain an explosion-proof certificate of the Japanese authority.

The company had had problems finding requirements for making a successful application for the certificate, even with a help of a Japanese-based sales company in the ABB group. Our office assisted the company in facilitating communications with the Japanese authority and in sorting out the requirements. A certificate was granted in 1994, yet it took the company two years before their effort was finally rewarded.

5.2 INAUGURATION OF THE INTERNATIONAL NORTHERN SEA ROUTE PROJECT AMONG NORWEGIAN, RUSSIAN, AND JAPANESE PARTNERS -- A CASE OF FRIDTJOF NANSEN INSTITUTE

Fridtjof Nansen Institute (FNI) attempted to initiate an international program to research possible opening of the Northern Sea Route for commercial cargo transport between Europe and the Pacific rim region. The Norwegian Embassy Tokyo including our office assisted FNI in finding potential Japanese partners, and in facilitating negotiations in later stages. After 2.5 years of its consistent effort toward Japan on this endeavor, FNI finally managed to inaugurate the five-year program among Norwegian, Russian and Japanese partners in 1993.

5.3 INTRODUCION OF ADVANCED NORWEGIAN EQUIPMENT FOR FISH FARMING IN JAPAN - A CASE OF A GROUP OF NORWEGIAN MAKERS OF EQUIPMENT FOR FISH FARMING

Both Japan and Norway represent major fish farming nations. Fish farming was picked up as an industry a few decades earlier in Japan than in Norway. Yet, Norway achieved a tremendous growth in salmon farming since early 80's with aggressively introduced advanced technologies in this industry. On the contrary, Japanese fish farming kept rather old-fashioned and domestic oriented during the same period as only fishermen who received license were allowed to start farming.

In 1990, Royal Norwegian Council for Scientific and Industrial Research (NINF) took an initiative to promote communications among companies of the two countries producing equipment for fish farming, with an attempt to initiate some business-oriented projects jointly in this field. Two joint workshops were held in 1991 and 1992 in this endeavor, but came up with no significant project at that time. In those workshops, our office worked as a Liaison office of NTNF as a point of communication with the Japanese counterpart. In 1994, the central figure in the Japanese counterpart took an initiative to establish an industrial forum named Japan International Food and Aquaculture Society (JIFAS) with about 50 Japanese member companies and a few international members from several countries

including Norway. The prime objective of JIFAS is to promote business creation for/among its member companies through international technology transfer. Our office has been cooperating with JIFAS to facilitate technology transfer between Norway and Japan. In early 1995, JIFAS took an initiative to introduce advanced Norwegian equipment for fish farming of several makers to a government-sponsored offshore fish farming project being carried out in Hokkaido. It was the first time in history that the government agreed to introduce foreign equipment to a government-sponsored project in fish farming, according to JIFAS.

5.4 SEEKING GLOBAL PARTNERSHIP FOR DEVELOPMENT OF A NEW FRAMEWORK FOR HOME-USE ELECTRONIC INFORMATION SERVICE WITH AN ADVANCED VIDEOTEX TELEPHONE - A CASE OF MAXTEL INITIATIVE

Under the initiative of Norwegian Telecom, the national telecom carrier (which was privatized earlier this year), a project called Maxtel Initiative was launched to develop a new framework for home-use electronic information service with an advanced videotex telephone which is similar to the French Minitel. Maxtel initiative aimed at achieving it through the establishment of global partnership with European, American and Japanese partners. Partnership with Japanese companies was sought from two respects: i.e., (1) to secure the most competitive touch-panel LCD (liquid crystal display), which represented a bottleneck for the development, and (2) to find a partner who is interested in introducing the service in Japan. Our office carried out a technology and partner survey in 1992. Later, the representatives of Maxtel Initiative visited Japan to carry out a thorough research by visiting the suggested candidates for partnership with an assistance of our office. Maxtel Initiative succeeded in attracting large European, American, and Japanese companies in the initial phase of the project. The project, however, was suspended later as the research revealed that technology was premature at that time to develop the high-performance telephone which meets the ambitious price target.

6 IMPLICATIONS FOR NORDIC COMPANIES CONTEMPLATING TECHNOLOGY TRANSFER OR GLOBAL PARTNERSHIP WITH JAPANESE COMPANIES

What do these cases suggest us? In the following, I would like to list five implications for Norwegian companies contemplating technology transfer and global partership with Japanese companies, and briefly discuss respectively why I think they are important. I assume most of the discussion here would also be applied to Nordic companies in general. Thus, I use 'Nordic' instead of 'Norwegian' at the title of this section.

A. Barriers related to Japanese language and business culture can be lowered by utilizing assistance of locals at disposal as the first point of contact.

The case of ABB Flexible Automation represents how difficult it is to communicate with Japanese authorities and understand how things work there, without knowledge of Japanese language and business culture. Other presented cases also share this problem to some degree. Good news for foreign companies are that Japanese information have become much more accessible in English for the last ten years, and doing business has become easier in such industries as computer, pharmaceuticals, and automobiles. Bad news, however, are that it is still not the case for domestic-oriented industries, and foreign companies still have a good chance to encounter problems related to this when approaching Japan. Cultural differences may make the problem more complicated sometime. In view of those factors, it is worthwhile for a Norwegian company to consider using the assistance of a technical attachés in Tokyo as the first point of contact.

B. Vital Japanese information which lead a company to successful technology transfer are often possessed by qualified individuals, and are revealed only through personal networking.

A key factor for success, for instance, in the case of Fridtjof Nansen Institute (FNI) was that the institute could be acquainted with a qualified Japanese researcher at a government research institute, in an early stage of FNI's approach toward Japan. This researcher's knowledge on the relevant

R&D activities in Japan and his personal network to probe potential partners were indispensable for the establishment of partnership. In case of a group of Norwegian makers of equipment for aquaculture, a central figure of Japan International Food and Aquaculture Society (JIPAS) plays a vital role as he is knowledgeable about aquaculture in both Norvay and Japan, so that he could timely match the needs and available solutions in the two countries. Networking in Japan is, thus, so important that a Norwegian company which uses our office could have better chance to be introduced to those qualified Japanese businessmen and researchers who could lead a company to successful technology transfer.

C. Success is critical to timing of approach to Japan.

The probability for successful technology transfer is higher in general if an approach to Japan is made at a right timing when the Japanese companies share similar interests. For instance, FNI approached Japan at a right timing as it was just after the end of the Cold War when people became optimistic to explore opportunities in relation to the new Russia. Maxtel Initiative approached Japan when LCD (liquid crystal display) makers became keen to develop new applications for the display besides notebook personal computers. Royal Norwegian Council for Scientific and Industrial Rescarch (NINF) approached Japan with a good intention, but it was slightly too early. After a few years, the climate for fish farming in Japan has somewhat changed and become more open to introduce foreign technologies. Besides, a number of Norwegian companies is approaching Japan in the fields of furniture and healthcare-related equipment these days. It is a high-time for collaboration as Japanese has become more demanding concerning their living standards, and has become aware that quality products and services developed in such foreign countries as Scandinavia are much more accessible due to the strong yen. To grasp the importance of the timing as a critical factor for successful technology transfer, there is a term 'strategic windows of opportunity'. This term is used to describe the limited periods during which the 'fit' between the key requirements of a customer market and the particular competencies of a firm competing in that market is at an optimum [6]. For not missing a 'strategic window of opportunity', it is vital for the individual company to be able to timely access quality information about Japanese business and technology.

D. With persistent approach to Japan, a company may have a better chance to achieve successful technology transfer, or encounter unexpected opportunities which are different from its original intention.

Both in the cases of ABB Flexible Automation and FNI, it took two years before achieving the results in Japan. In case of a group of Norwegian makers of equipment for fish farming, it took as long as 4 - 5 years before bearing fruits in the form which was beyond the original intention of the Norwegian. In some cases like these, the pursuit for technology transfer and global partnership may be compared to a full marathon. Successful cases often followed certain milestones, such as: Milestone #1 - carrying out a survey to identify promising technologies/partners, Milestone #2 - approaching the candidates to find out the most promising ones to negotiate, Milestone #3 - negotiating to reach a preliminary agreement, and Milestone #4 - further negotiating to reach an agreement for technology transfer or partnership.

Erling Kagge, a Norwegian adventurer who arrived the South Pole by skiing alone on January 7, 1993, once told that good homework was the only secret for success of the adventure [7]. It is applied to the pursuit of technology transfer and partnership as well. The home work may take sometime before arriving a point of contacting the selected candidates for collaboration. On top of it, the Japanese side tends to proceed with the project in a rather formal manner which can also be time consuming. Good follow-up of communications with potential partners is as important as a good intention and homework.

E. Perceived influence of a Norwegian company to set international standards and/or innovative product concepts can be used as a lever when contemplating global partnership with Japanese companies.

The case of Maxtel Initiative is a good example to understand what would attract Japanese for collaboration with Norwegian companies. The Japanese tend to criticize that they are weak in taking a leadership in establishing international de-facto standards in the fields of emerging industries. In the fields of multimedia, as an example, they long for those American

companies who are making strides in setting the rules of the new-ball game, e.g. Microsoft, Oracle, and General Magic, etc. When it comes to the established international standards such as ISO (International Organization for Standardization) and IMO (International Maritime Organization), the Japanese long for the position of European countries which seem to be much more influential in setting the standards. Maxtel Initiative succeeded in attracting some Japanese companies as the Japanese expected they could take advantage of reaching a network of European and American companies which are interested in future forms of electronic information services, by taking part in the project.

7 CONCLUSION

We have always tried to provide an individual solution to serve the need and interest of a company at home. After ten years of operation in Tokyo, We are still making new tries and errors, realizing we are in a continuous learning process of designing our service to better fit the dynamic needs and interests of the Norwegian industry in relation to Japan. Yet, our prime wish remains the same that we should like to be an effective catalyst to facilitate technology transfer and global partnership with Japanese companies.

REFERENCES

1. "Minifacts about Norway 1994 - 95", Statistics Norway in cooperation with the Royal Ministry of Foreign Affairs, Oslo, Norway, p. 51.

2. Öyslebö, Jon-Åge, 1991, 'Norway Information: Made in Norway - Exports a must for industry', produced for the Ministry of Foreign Affairs by NORINFORM, p. 2.

3. Porter, M, 1991, His presentation at the 5th Scandinavian Management Symposium at NHH in Bergen, Norway, March 4 - 5.

4. Hamel, G. and Prahalad, C. K., 1994, 'Competing for the Future', Harvard Business School Press, p. 28.

5. Peridis, T., 1992, 'Strategic Alliances for Smaller Firms', Research in Global Strategic Management, Vol. 3, JAI Press Inc., pp. 131 - 134.

6. Farquhar, P., 1992, His visiting lecturer at Aoyama Gakuin University, Tokyo, Japan, April 22 - May 9.

7. Kagge, E. 1994, His presentation at the Fridtjof Nansen Memorial Lecture, Tokyo, Japan, October 14.