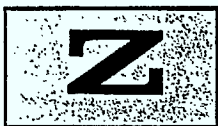


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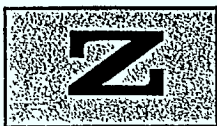
**A REVIEW OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

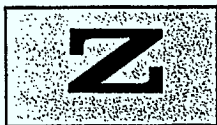
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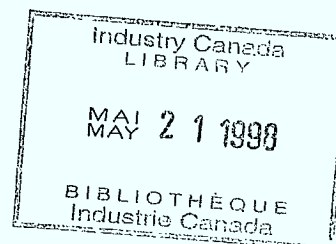


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MARCH 1991



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INTRODUCTION

This is the first version of A Survey of Initiatives to Support Software Industry in Selected Countries. It provides a summary and lists of individual initiatives to support software industry in twelve countries. The survey was conceived as a continuously upgradable working document for the use of Information Technologies Industries Branch of Industry, Science and Technology Canada.

It was compiled from ZZ International files, The Coopers & Lybrand Consulting Group files, as well as some of the ISTC ones. The survey used reports from OECD, EEC and governmental agencies of eleven reviewed countries. Many materials were supplied by foreign government officials, Canadian government officials, and our consultant associates abroad. Numerous individuals from the software industry provided additional input. Literally thousands of pieces of information culled from books, reports, articles, newspaper clippings, annual company reports used. Close to a hundred of personal interviews or requests for information have lead to this version.

The paper is as comprehensive and accurate as time and resources allocated allowed. The format chosen for the report helps conveniently to identify information needed to be obtained.

The open-ended framework allows also a continuous up-date, as the information is received. A systematic annual update and a possible extension to about a half a dozen other countries is recommended.

ACKNOWLEDGEMENTS

This report forms part of the ISTC project "Benchmarking the Canadian and U.S. Software Products Industries".

The basic orientation of the study and its framework emerged from the discussions with Eric Rule and Brett Knowles of The Coopers & Lybrand Consulting Group. Lucie Guertin provided many inputs from around the world. Samantha Lee had the unenviable task to convert the illegible drafts into the present form.

The sources of information for this survey have been so numerous that it is impossible to list them all. Although I cannot possibly thank to all those who helped with this task, I feel that I have to mention at least the following individuals, who did more than their duties:

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All these people helped by providing their perspectives or information. The errors are mine.

Zavis P. Zeman
ZZ INTERNATIONAL

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**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

JAPAN

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

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THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

JAPAN

The Asian archipelago country, where 124 million people are crowded on 378 thousand sq.km. (about the size of Newfoundland), had in 1990 a GNP of Yen 418 trillion, (US\$3.1, C\$3.5 trillion), US\$25 thousand per capita, that is one fifth more than in Canada.

The industrial landscape of Japan is dominated by business conglomerates, keiretsu, which link scores, if not hundreds, of companies with financial institutions and trading companies, employing hundreds of thousands of employees, several with a joint gross product larger than that of, for instance, Sweden or Ontario. These giants are very agile, flexible due to huge networks of small firms (contractors and spinoffs), that surround them.

There are many causes of the so called Japanese miracle. In our assessment, besides the "controlled competition", it is the most comprehensive and deliberate strategy of technological development that underlies an incredible economic growth of Japan from the ashes of the World War Two to the present juggernaut status. The basic technological strategy has been the "reverse" model, relying on continuous incremental improvements of foreign technologies. However, as Japan is transforming herself into a knowledge-intensive economy, her R&D has increased dramatically, to 2.7 percent of GNP, that is to over US\$81 billion. The 1988 Act on Consolidation of the R&D System, added a number of new initiatives, some of them listed under the individual entries below.

Japanese Markets and Industry

The Japanese total computer market today is in the order of US\$115 billion. While IBM Japan is still a big player in the country in the general purpose computers, the indigenous industry, lead by Fujitsu, NEC, Hitachi, with Toshiba and others in tandem, has made continuous progress to becoming world-class information industry. Collectively, they are the only challenge to the Big Blue in the world dominance of the industry. Each of the Big Three is larger than Unisys, each employs over one hundred thousand people. The largest domestic computer maker Fujitsu has Yen 1.6 trillion (US\$12, C\$14 billion) sales, NEC's computer-related revenues reached Yen 1.4 trillion (over US\$10, C\$13 billion), those of Hitachi, some Yen 1.1 trillion (US\$8, C\$9 billion). Those of Toshiba are Yen 600 (US\$4.5, C\$5) billion.

Japanese software and services market reached Yen 3.3 trillion (US\$24, C\$28.5 billion) by 1988. The software market alone was Yen 1.8 trillion (US\$13.3, C\$15.6 Billion). The market is dominated by custom software, only about one seventh - Yen 260 billion (US\$1.9 or C\$2.25 billion) are software products. There are over twelve hundred commercially distributed software products. Imports, predominately from the U.S., hold about a half of the packaged product market.

There are over 3,700 software companies in the Japanese industry. There is about a million of software writers. The Japanese speak of a 1990 shortage of 600,000 software specialists. The structure of Japanese software industry differs significantly from the North American one. There are of course similarities. The large developers of software are also to be found with the hardware manufacturers, who account for a good quarter of the country's capacity. Their in-house software entities are sizeable. Fujitsu, for instance, employs 6,000 software people, Hitachi has over 3,000 and the King of Laptops Toshiba employs 5,000 in this area, while the King of Micros, NEC, has around 6,000 people.

However, throughout the Eighties all the Japanese hardware manufacturers have spun off "captives" - either software subsidiaries, or nominally independent software houses. Hitachi has spun off close to twenty of such outfits, Fujitsu at one time in mid-eighties was shedding off five subs a year, and is today linked to over 30 software houses. NEC has had eleven dedicated subsidiaries and a network of 250-odd subcontractors, with over 4,000 contract workers, working exclusively for the company.

At the beginning of Eighties, the users too started to move their software development to the captive subsidiaries. Captive subs of major trading companies, banks, security dealers, steelmakers, shipbuilding and car manufacturers are among the largest software organizations in Japan. For instance, Nomura Computer System, a child of the largest securities dealer of the world, ranks among the Big Three of the industry. More recently, in the wave of often dramatic restructurings, users such as Komatsu or NYK, to name just the two, have been shaving off their computer departments and creating captive software houses, often to provide new strategic corporate directions. The case in point is the largest steelmaker of the world, Nippon Steel Corp., that created four software companies, signalling an entry into computer business.

As a result of this spinning off activity, the number of software companies doubled in the second half of 1980s to close to thirty eight hundred. Most of these, although nominally independent, are then in fact, extended arms of their parents, who provide capitals, market access and management savvy. There are nine different industry associations which promote interest of software companies. The two most relevant are Japan Information Service Industry Association (JISA) and Japan Personal Computer Software Association (JPSA).

Software research is conducted in government laboratories, such as ETL of MITI, in NTT (which accounts for about one fifth of all the research), in the large cooperative projects (see below), and in JIPDEC.

The independents are lead by CSK, a software development company with annual software sales of Yen 675 (US\$5, C\$6) billion, and with over six thousand employees. A great success is Konami, the developers of software for Nintendo, with annual sales in the order of Yen 55 billion (US\$400, C\$500 billion). Only another handful has sales over US\$100 million. Top fifty independents account for a half of revenues. The true independents tend to be smaller, ranging in size from a few individuals to several hundred employees. It is them who suffer most from the shortages of software personnel.

The higher yen and the acute personnel shortages have pushed some software developers to development offshore. To illustrate, Fujitsu, NEC, Toshiba, as well as software houses such as Cosmo 80 or Core Corp are among the companies setting up shops in China. Toshiba, IBS and Century Research Center Corp. advanced to South Korea, others to Singapore, Taiwan, Malaysia and the Philippines. To help with the strengthening of links in the industry of the region, the Japanese Software Industry Association has inaugurated in the second half of 1980s an "Asia-Oceania Software Community", which incidentally include Australia.

National Policies

The ascent of software industry in Japan did not just happen by an accident, it is a result of a dedicated effort. The information industry was designated as strategic already in 1957, the Laws of 1970, 1971 and 1978 are important milestones. By 1980, the Japanese started to view software as the critical part of their computer industry. Japan have worked hard ever since to overcome a recognized handicap.

They are building on strength: on successes in custom applications, in areas such as electronic funds transfer, on-line banking, or in airline/railway reservation systems. They are very strong in "embedded" CAD/CAM, to say nothing of video games ("Nintendo" phenomenon). In the drive to close the gap with the software leaders on this side on the Pacific, about which much has been written, the Japanese have relied on their capability to constantly increase their productivity (at present 70 percent higher than U.S.), on their passion for painstaking quality control (at present error rates half of the U.S.) and on their project management excellence.

As always, the efforts of the Japanese are the interaction of government and private sector initiatives. A very complex web of overlapping initiatives in this area is not at all easy to understand and classify.

The Ministry of Industry and Trade (MITI), through its Machinery and Information Industries Bureau and Data Processing Promotion Division, is a lead agency for software industry-related initiatives. MITI budgets for software-related activities are in the order of C\$1.4 billion (Yen 158 billion). The Ministry of Ports and Telecommunications (MPT) has been engaged in a struggle with MITI for influence of policy in this area. Nippon Telegraph and the Telephone (NTT) plays enormous role as well.

There are numerous general initiatives, from which the software companies benefit. We can list only a few.

- o The most important help to companies is the availability of low-cost-capital, through the banking system.
- o The smaller companies, benefit from programs of the Japan Small Business Corporation (#J-O-1), (#J-H-1).
- o The regional development efforts to boost the areas outside The Pacific Belt (Osaka-Nagoya-Tokyo/Yokohama), known as the Technopolis Plan (#J-I-1) offer location incentives also to software companies. Some technopolises focus on them. Over a hundred of software factories have located in the outlying areas as a result.

- o The Japanese software companies interested in R&D may obtain interest - free loans (#J-F-1), if they are of foreign origin there are low-interest loans available (#J-F-2). The government influences positively access to public and private venture capital (#J-F-3).
- o National Research Projects Program has important software elements (#J-R-1), (#J-R-5).
- o The Japanese high tech FDI to North America and to Europe involves software companies (#J-R-2).
- o The resources of Japan Key Technology Centre (#J-R-3) are available to software companies as well.
- o Software companies benefit by purchases of government-commissioned research (#J-R-4).
- o The companies may receive licences for software technologies developed in government laboratories or national research programs from JITA (#J-R-5).

The industry-specific measures of MITI have been formulated in the visions (bijon) and the administrative guidelines. Tax incentives include complicated tax reserves for program maintenance and for general use software. Most important measures are the soft (5.2 percent) loans, offered through Japan Development Bank. About C\$1 billion is pumped into the industry a year. Low-interest government loans are used less often. MITI encourages also more or less temporary linkages with foreign software developers. They often result in technology transfers first to the Archipelago, followed by intensive product improvement with a subsequent boomerang back to North America.

The government also introduced in 1986 two pieces of legislation that promise to change the industry in a big way. The Law for the Labour Dispatching Businesses, which recognized these companies as legitimate businesses by providing them with legal protection, means that the body-shop type of software houses will be able to develop from "de facto" temporary personnel agencies into real software contractor firms. A revision of the Copyright Law gave apparently definite protection to Japanese computer programs. The legislation not only strengthened software houses but created much more favourable conditions for the development of packaged software, which still does not exceed more than one seventh of the software writing capability.

The most publicized industry-specific government initiatives, are the large cooperative projects. These are going back fifteen years, focusing on creating groupings of software companies: in 1973 to strengthen their management, in 1977 to attempt to automate programming, in 1979 to focus on the Japanese language programming. The successful completion of the eight-year-long collaborative program in the 1970s, the PIPS (Pattern Information Processing System) belongs to this category as well. Needless to say, quite sizeable (although not as fabulous as sometimes reported in the West) sums of government funds always accompanied such spurts.

The most publicized effort to change the relative standing in software development is of course the Fifth Generation Computer System Project, announced in 1981, which is a year from completion. The three most critical elements of the FGCS are all software-based (#J-R-6).

In 1985, MITI initiated a cooperative five-year program of development of automated software environment FASET, managed by the Joint System Development Corp. (#J-R-7).

In 1985, MITI initiated yet another collaborative initiative, the Sigma Project, a five-year government-private joint project, aimed at reducing the shortage of software developers. Armed with a C\$260 million budget, the seven major hardware manufacturers and 150 software houses aim at quadrupling the production of software by means of automation, networking, sharing of resources and development of support software. (#J-R-8)

The 1988 software development initiative sets up a Software Technology Development Center, to further promote the cooperation among the software developers by improving the reuse of software, legalized by the 1984 "Software Rights Law". The project is the joint effort of Ministry of International Trade and Industry and Information Technology Promotion Agency.

For all these collaborations, of special importance are the software R&D entity JIPDEC (#J-R-9) and the Software Information Center (SOFTIC).

Further government measures in human resources and market development must be mentioned at least briefly. The measures to overcome the shortage of software talent are discussed in (#J-H-2), (#J-H-3) and (#J-H-4). The government procurement plays a crucial role in the Japanese model, for more, see (#J-M-1). Procurement by NTT plays the extremely significant role as well. NTT functions as the "first user" - such as DOD in the USA does.

Of the private initiatives, none is more important than the TRON (The Real-time Operating System Nucleus) projects to develop a new computer standard by developing a new architecture. Conceived in 1984 by Prof. K. Sakamura of Tokyo University, the hardware part aims to develop the first purely Japanese microprocessors, claimed to run three times faster than the top U.S. products. The software teams develop a family of four operating systems-ITRON, BTRON, CTRON and MTRON - to run the TRON chips. The private TRON Association has eight big core members (combined sales of \$200 billion) and close to 90 associates. The government here helps by above all by procurement. Despite its private nature, this drive for TRON standard should be seen as a very crucial instrument of national policy.

It is quite clear that the Japanese have put a lot of effort into closing the much reported software gap with the United States, and that they are doing so surprisingly quickly.

REF. # J-O-1

COUNTRY:	Japan
INITIATIVE:	Japan Small Business Corporation
CATEGORY:	Overall
GOAL:	Increase competitiveness of SMEs
AGENCY:	MITI Small and Medium Enterprise Agency
DESCRIPTION:	<p>The government encourages SMEs to develop new business activities through mutual cooperation, subcontracting, symbiosis with larger companies. Small enterprises are also eligible for various tax advantages. There are several programs of business information service, of support for R&D (Technological Pioneer Training Project), for training of managers and loans for marketing of products, and even foreign direct investment for technological upgrading of SMEs.</p> <p>In order to assist small and medium-sized enterprises to find out about and benefit from managerial resources and techniques of other firms, the prefectural governments organize monthly meetings for the purpose of information exchanges on market and technology issues (Technology Market Exchange Plaza). The Japan Small Business Corporation organizes similar events but at both regional and national levels, leading to broader exchanges.</p>
FUNDING:	TBD
USE:	TBD
LAST UPDATE:	February 1991

REF. # J-O-2

COUNTRY:

Japan

INITIATIVE:

Information-technology Promotion Agency (IPA)

CATEGORY:

Overall

GOAL:

Promote information technology industry

AGENCY:

MITI, IPA

DESCRIPTION:

Information-technology Promotion Agency (IPA) is a special juridical body under MITI's jurisdiction with a legal mandate to promote the information processing industry. The IPA is funded directly from MITI's budget and from contributions from Japanese companies, associations, and three long-term credit banks. In fiscal 1988, MITI's contribution to IPA's general account budget was Yen 1.21 billion (about US\$9, C\$10.5 million); IPA manages additional government funds for specific software R&D projects, such as Sigma, which it oversees (#J-R-7).

The IPA seeks to foster the Japanese software industry in several ways:

- o The IPA serves as a conduit for MITI subsidies to software houses and information processing centers for the development of software. The software developed becomes the property of the IPA, which leases them to users. So far, this initiative has been a failure.
- o The IPA administers large scale joint R&D projects with funds from MITI's budget and other sources, such as Sigma.
- o The IPA guarantees loans to software firms; software houses and information processing companies can get loans for their total in-house business.
- o The IPA grants to software firms tax benefit certificates for development of general use applied programs in Japan. Under this program 50 percent of the sales revenues can be reserved in a tax-free fund for four years.
- o To assure quality of software, the IPA set up the Software Review Board which issues 25 years warranties on certified software.

Page 2

REF. # J-O-2

DESCRIPTION:	o In 1988, the IPA established the Software Technology Development Center as a laboratory to provide companies willing to develop new software with computer equipment, facilities and funds for personnel. The Center, staffed by engineers from industry, government and universities, has concentrated its efforts on language compilers, CAD/CAM software and data base management systems.
FUNDING:	See above
USE:	Extensive, but the leasing scheme was a failure
LAST UPDATE:	March 1991

REF. # J-1-1	
COUNTRY:	Japan
INITIATIVE:	Technopolis Plan
CATEGORY:	Infrastructure
GOAL:	Reduce the development gap between metropolitan and outlying areas
AGENCY:	MITI
DESCRIPTION:	<p>The Ministry of International Trade and Industry announced in 1980 its plan to build several technopolises throughout Japan. Forty out of 47 Japanese prefectures requested to host such hi-tech complexes. In 1983, the Law for Accelerating Regional Development based upon High-Technology Industrial Complexes (the "Technopolis Law") was enacted. From the fourteen technopolises originally selected, the number has gradually grown to the present 26. Utsunomiya, Kumamoto, Nishiharima research and Koriyama are the most successful as of today. Tsukuba Center Inc. and five other R&D research complexes have been approved as research cores by 1988. Utsunomiya, Kumamoto, Hiroshima and Oita technopolises specifically focused on attracting software development companies.</p> <p>Industrial Technology Promotion Organizations in each region are the focal bodies to promote the Technopolis Plan. The total MITI budget to support this program is the surprisingly modest US\$10 million a year. The bulk of the funds comes from prefectural governments and from the business community.</p> <p>The potential investors are offered two types of incentives: tax measures (special depreciations, of 30 and 15 percent on equipment and plant respectively), and financing measure (low interest 15-year loans from central, prefectural and municipal governments). Moreover, there are research grants for prefectural R&D laboratories available also to companies, that participate in joint research with them.</p> <p>Technopolises are to provide opportunities for cooperation between the companies, universities, research institutes and municipalities.</p>

Page 2

REF. # J-I-1

DESCRIPTION:	While there have been reports that the Ministry of Education and Ministry of Agriculture have not been too cooperative with MITI, it is too early to assess the success of the plan. The technopolis main infrastructure was to be completed by 1990, with the bulk of developments continuing into 1990s. Clearly, it is a long-term initiative, and will have to be assessed from that perspective.
FUNDING:	See above
USE:	Close to a hundred software companies
LAST UPDATE:	March 1991

REF. # J-F-1

COUNTRY:

Japan

INITIATIVE:

Interest-free loans to companies engaged in R&D

CATEGORY:

Financing

GOAL:

Encourage R&D

AGENCY:

MITI

DESCRIPTION:

Companies are entitled to interest-free loans for creating or strengthening their R&D activity. The loans are of "Hojokin" (conditional) type.

(For more detail see #J-R-3)

FUNDING:

T.B.D.

USE:

T.B.D

LAST UPDATE:

March 1991

REF. # J-F-2

COUNTRY:

Japan

INITIATIVE:

Low-interest loans to foreigners

CATEGORY:

Financing

GOAL:

Reducing the balance of payment surplus

AGENCY:

Japan Development Bank

DESCRIPTION:

In fiscal year 1990, the government expanded its program of low-interest loans provided by the Japan Development Bank to foreign companies and to subsidiaries with at least 50 percent foreign ownership, to encourage inward investment into the country.

In 1990, software development has been added to the advanced technology - related investment.

FUNDING:

To be increased in 1991

USE:

T.B.D

LAST UPDATE:

February 1991

REF. # J-F-3

COUNTRY:

Japan

INITIATIVE:

Access to Venture Capital

CATEGORY:

Financing

GOAL:

Provide access to venture capital

AGENCY:

Ministry of Finance, MITI

DESCRIPTION:

For a number of historical reasons, venture capital still plays relatively timid role. Investing in high risk start-ups is rare in a culture that does not worship a lonely entrepreneur. Only about ten percent of placements are in start-ups. The VC industry is most often involved in identifying companies that have a potential to be listed publicly and offering them pre-flotation placement capital.

Public support to venture business has ben provided by:

- o Small and Medium Size Enterprise Investment and Promotion Companies. One of these public finance companies is established in each of the three main industrial areas of Japan, i.e. Tokyo, Nagoya and Osaka, to buy new stocks and convertible bonds and offer consultancy services to new ventures in thirty different economic sectors. They supported about 140 projects during a year in the 1980s.
- o Selective public guarantees for long-term loans to firms being started up. These guarantees cover 80 percent of the amount of the loans, with a ceiling of \$600,000, and are available to those ventures in any sector having a good technological base and concrete plans to develop new products. A pay-back premium is imposed, to be paid by successful ventures to the Center for the Development of R & D Originated Enterprises (linked to MITI), which monitors the scheme. 500 ventures were thus supported, among which were 50 definitive successes and 80 failures.
- o One of the important developments was the development of the over-the-counter (OTC) market, with above 300 listings. The traditional low regard with which the companies viewed OTC has been changing. Promising computer and software companies, such as Ascii Computer, Fuji Software and Japan Systems Development have been brought to the market successfully. OTC will be fully automated in 1991.

DESCRIPTION:

There are about one hundred private venture - capital companies. The real risk takers are not numerous, most of funds are subsidiaries of financial institutions. Several funds, such as Paribas or Orient Capital, involve foreign participation. A dozen leading VC funds are:

<u>Fund Managers</u>	<u>Paid-in Capital (Yen mil.)</u>	<u>Company Development Stage</u>	
		<u>Start Ups</u>	<u>Develop- ment</u>
Diamond Capital	500	Y	Y
Fuji Investment	450	Y	Y
New Japan Finance	3,000	Y	Y
Nippon Enterprise	10,000	N	Y
Okasan Finance	100	Y	Y
Orient Capital	300	Y	Y
Paribas Tech-Japan	5,000	Y	Y
Sanwa Capital	200	N	Y
Sanyo Finance	500	Y	Y
Wako Finance	300	Y	Y
Yamaichi Univen	3,400	N	Y

FUNDING:

US\$2.3 billion

USE:

See above

LAST UPDATE:

March 1991

REF. # J-H-1	
COUNTRY:	Japan
INITIATIVE:	Training
CATEGORY:	Human Resources
GOAL:	Strengthen SMEs
AGENCY:	Japan MITI (SMEA)
DESCRIPTION:	<p>The public authorities lead by Small and Medium Enterprises Agency of MITI are promoting the development of human resources for small and medium-sized enterprises, by widening the range of opportunities for learning managerial skills. Training programmes for personnel, senior staff and management are organised by the prefectures and ten major towns, while specialised institutes under the Japan Small Business Corporation train entrepreneurs and their successors, administrative staff and prefectural staff responsible for counselling small and medium-sized enterprises.</p>
FUNDING:	T.B.D.
USE:	T.B.D
LAST UPDATE:	March 1991

REF. # J-H-2	
COUNTRY:	Japan
INITIATIVE:	Software Training
CATEGORY:	Human Resources
GOAL:	Bridge the gap in supply of software specialists
AGENCY:	MITI
DESCRIPTION:	<p>Japan suffers already from the shortage of 600,000 software specialists in 1990, according to MITI.</p> <p>The shortages are felt especially among the smaller firms.</p> <p>In 1987, MITI launched its Information University to train instructors for regional "information colleges". MITI collaborates on the next phase of software training scheme (#J-H-3).</p> <p>MITI contracts with outside organizations to train software technicians and sponsors courseware development for their training (CAROL).</p> <p>Much of training is done by the large companies, who organize their own training, which emphasizes standardized practices and systematisation reviews. The companies are entitled to a tax deduction equivalent to 20 percent of training expenses.</p> <p>The Japan Small Business Corporation (#J-O-2) now offers training courses in computerization.</p> <p>There is also promotional programs for use of computer in schools.</p>
FUNDING:	T.B.D.
USE:	T.B.D
LAST UPDATE:	March 1991

REF. # J-H-3	
COUNTRY:	Japan
INITIATIVE:	Educational Centres outside Tokyo Area
CATEGORY:	Human Resources
GOAL:	Train 6,000 software specialists a year
AGENCY:	MITI, Ministry of Labour
DESCRIPTION:	<p>MITI and the Ministry of Labour collaborate on the project to establish 30 local education centres for training software specialists outside the Tokyo area, where some 60 percent of software companies are located.</p> <p>The goal is to train six thousand software engineers annually within five years, while improving the geographical spread of software expertise.</p>
FUNDING:	Unknown
USE:	Too early to evaluate
LAST UPDATE:	February 1991

REF. # J-H-4

COUNTRY:

Japan

INITIATIVE:

Software Engineering Diplomas

CATEGORY:

Human Resources

GOAL:

National Certification

AGENCY:

MITI

DESCRIPTION:

The result of Japan-wide examination procedures for qualifications, regardless of what form initial training may have taken, are attested by national certificates, called Software Engineering Diplomas.

FUNDING:

T.B.D

USE:

T.B.D

LAST UPDATE:

March 1991

REF. # J-R-1	
COUNTRY:	Japan
INITIATIVE:	National Research Projects Program
CATEGORY:	R&D
GOAL:	Strengthen Japanese R&D
AGENCY:	MITI (AIST)
DESCRIPTION:	<p>The government encourages the development of new technologies to strengthen the foundations for further economic development.</p> <p>One of the initiatives are five national R&D programs with a number of software development components. The most relevant are:</p> <ul style="list-style-type: none"> o Large-Scale Project <ul style="list-style-type: none"> - High speed computer for scientific and technological - Advanced robot technology user - Inter-operable databases <ul style="list-style-type: none"> - Promotion of Open System Interface - (OSI) o Medical and Welfare Apparatus Technology <ul style="list-style-type: none"> - Book reader for the blind - Vocal and speech training device o Basic Technologies for Future Industries <ul style="list-style-type: none"> - Super-lattice Devices - Three-dimensional ICs
FUNDING:	Example: Inter-operable Databases: Yen 15 billion (US\$111, C\$130 million)
USE:	T.B.D.
LAST UPDATE:	March 1991

REF. # J-R-2

COUNTRY:

Japan

INITIATIVE:

Foreign Direct Investment (FDI)

CATEGORY:

R&D

GOAL:

Strength R&D base by FDI

AGENCY:

Keindanren (?)

DESCRIPTION:

By 1989, the accumulated Japanese FDI reached US\$254 billion. Japan has become the world's most important source of investment capital.

Over the last five years, the Japanese increased their effort to acquire even small shares in venture capital and in high tech companies in the U.S.A., as well as in European Community, that are well positioned in strategic market niches.

FUNDING:

See above

USE:

Close to 200 investments into U.S. high tech by 1989, over 70 investments in EC.

LAST UPDATE:

March 1991

REF. # J-R-3	
COUNTRY:	Japan
INITIATIVE:	Japan Key Technology Centre
CATEGORY:	R&D
GOAL:	Assistance to firms engaged in R&D
AGENCY:	MITI
DESCRIPTION:	<p>A MITI-supported agency, the Japan Key Technology Centre, provides services, information and financial assistance to firms engaged in R&D.</p> <p>The 1988 financial assistance consisted of:</p> <ul style="list-style-type: none"> - investment subsidies - Yen 19 billion (C\$165 million); - interest-free loans to companies, engaged in R&D - Yen 7 billion (C\$61 million).
FUNDING:	See above
USE:	T.B.D.
LAST UPDATE:	March 1991

REF. # J-R-4	
COUNTRY:	Japan
INITIATIVE:	Support of Industrial R&D
CATEGORY:	R&D
GOAL:	Support Industrial R&D
AGENCY:	MITI
DESCRIPTION:	<p>Only two percent of R&D performed by industry is government financed. Industrial R&D is supported only in areas, where market has failed due to:</p> <ul style="list-style-type: none"> - long-term nature of research and commercialization process - investments needed are large-scale - research has to integrate different research disciplines - large and pressing public needs, with poorly developed markets, diffused demand or inadequate supply of technology (e.g. environment) <p>The prevailing forms of instruments used are "itakuhi" - commissioned research (40 percent), tax concessions (35 percent) and grants (25 percent).</p>
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	March 1991

REF. # J-R-5	
COUNTRY:	Japan
INITIATIVE:	Japan Industrial Technology Association (JITA)
CATEGORY:	R&D
GOAL:	Technology Transfer: Government to Industry
AGENCY:	MITI (AIST)
DESCRIPTION:	<p>One branch of the Ministry of International Trade and Industry (MITI), the Agency of Industrial Science and Technology (AIST), looks after the sixteen national research laboratories (including Electrotechnical Laboratory) and manages five National Project R&D Programs (such as Large-Scale Project or Basic Technology in Future Industries). A non-profit Japan Industrial Technology Association (JITA) transfers AIST-owned technologies to the industry, by granting licences in Japan and abroad.</p>
FUNDING:	<p>Government: Yen 1.2 billion (C\$10 million)</p> <p>Private: Donations: Yen 340 million (C\$3 million)</p> <p>Membership Fees: T.B.D.</p>
USE:	Extensive
LAST UPDATE:	March 1991

REF. # J-R-6	
COUNTRY:	Japan
INITIATIVE:	Fifth Generation Computer Project (FGCP)
CATEGORY:	R&D
GOAL:	Bring Japan into the forefront of world computing
AGENCY:	Institute for New Generation Computer Technology (ICOT)
DESCRIPTION:	<p>The Institute for New Generation Computer Technology (ICOT) was established in 1982 by MITI and leading Japanese computer producers. The Board of Directors includes CEOs of Toshiba, Fujitsu, Hitachi, Matsushita, Mitsubishi Electric, NEC, NTT, Oki and Sharp. The Institute is a ten-year effort to promote research and development of new generation computer technology. The projected budget was Yen 100 billion (US\$740, C\$870 million), all paid by MITI. Originally too ambitious, the project was scaled down. The actual costs will be lower, in the order of Yen 50 billion (US\$370, C\$435 million). The ICOT staff was in the order of 100 by 1988, with another 350 in the participating firms. Furthermore, further 200 individuals are involved in promotion committees and working groups in academia and research institutes. About fifty foreign researchers have worked at ICOT in the Eighties.</p> <p>As of late 1990, ICOT was organized into seven research laboratories and nine external groups (NTT and eight computer manufacturers, represented on the Board of Directors).</p> <p>To date, ICOT achieved progress in:</p>

DESCRIPTION:	<ul style="list-style-type: none">- parallel logical inference (PROLOG, PIMOS, PSIM)- knowledge-base subsystems (Delta)- natural language understanding (Duals)- knowledge processing experimentation- problem solving and inference software. <p>Irrespective of what version of a prototype 5G system the FGCS produces, ICOT will be already credited with building a basic research entity in symbolic computing, that Japan badly lacked. ICOT also significantly helped to internationalize Japanese computing research. ICOT also convinced Japanese that they should continue developing software for massively parallel processing.</p> <p>The commercial spinoffs of the project are only a few. They will come only in the 1990s and beyond. Present Japanese strength of Japanese industry in fax, let us keep in mind, may be traced to the FGCS's predecessor, the PIPS project of the 1970s.</p>
FUNDING:	FY 1990 budget: Yen 7 billion (C\$60 million)
USE:	The project will be authoritatively evaluated in 1992.
LAST UPDATE:	March 1991

REF. # J-R-7	
COUNTRY:	Japan
INITIATIVE:	Joint System Development Corporation
CATEGORY:	R&D
GOAL:	Development of large scale software projects
AGENCY:	JSD
DESCRIPTION:	<p>Joint System Development Corporation (JSD) was established by MITI in 1976 to strengthen software firms' ability to compete with computer hardware makers in the software market. The JSD, which is funded through the IPA, consists of important software makers who also represent the interests of a large number of nonmember software firms. The JSD solicits contracts for the development of large-scale software projects, which it administers and promotes, and coordinates the software sales activities of its members. JSD has carried out a number of large-scale R&D projects using personnel on loan from member companies as well as its own employees. The projects themselves have been funded either directly from MITT's budget, or from surpluses from the so-called Bicycle Racing Funds, established from the proceeds of wagering on bicycle races.</p> <p>In 1985, the Joint System Development Company initiated the Formal Approach to Software Environment Technology project (FASET) to develop an automated software environment. The project continued until 1990, with funding from the IPA totalling 2.2 billion yen (about US\$16 million). JSD conducted R&D work, along with Software Research Associates, Mitsubishi Research Institute, NEC Software Company, Japan Information Service Company and INTEC Inc. on several specification languages for different application fields. FASET was designed to foster early detection of design errors and thus a reduction in error rates, promotion of standardization of software, and transferability of software specifications to different systems.</p>
FUNDING:	Yen 2.2 billion (US\$16, C\$19 million)
USE:	See above for a partial list
LAST UPDATE:	March 1991

REF. # J-R-9	
COUNTRY:	Japan
INITIATIVE:	JIPDEC
CATEGORY:	R&D
GOAL:	Applied R&D projects in information processing
AGENCY:	JIPDEC
DESCRIPTION:	Japan Information Processing Development Center (JIPDEC) foundation, overseen by MITI, was jointly established by MITI, the Ministry of Posts and Telecommunications, and computer producers and users; it has been funded by subsidies from the Bicycle Racing Fund, members' dues, the interest from a basic fund, and the proceeds of project contracts. JIPDEC conducts surveys and studies of subjects of interest relating to data processing as well as R&D projects in the information processing field. Most of its R&D is performed for MITI, MPT, and the Administrative Management Agency.
FUNDING:	Difficult to determine
USE:	Extensive
LAST UPDATE:	February 1991

REF. # J-R-8	
COUNTRY:	Japan
INITIATIVE:	Sigma
CATEGORY:	R&D
GOAL:	Development of Software Production Tools.
AGENCY:	Information Technology Promotion Agency (IPA)
DESCRIPTION:	<p>An industry-government five-year R&D project, initiated by a start-up financing of 25 billion yen (\$230 million) by MITI through IPA. It is financed equally by the government and by 36 participating companies. The rationale for the project is created by a perceived shortage of 600 thousand software specialists by 1990.</p> <p>The objective of Sigma was to develop a system for automation of software production. The goal was to achieve automation of about 80 percent of software development. The project aimed at developing a set of CASE tools, compatible and linked throughout Japan.</p> <p>The Sigma project consists of the Sigma centre (staff of 50, from IPA and participants), of the Sigma network and of the two scores of Sigma users' sites. These are equipped with Sigma workstations.</p> <p>Among the participants are all the leading companies such as Fujitsu, Hitachi or Toshiba.</p> <p>At least two scores of experimental software tools were developed by the participants. By the end of 1988, the Sigma infrastructure was essentially completed.</p>
FUNDING:	The estimate of the total size of the effort is to be confirmed, but the total amount till 1990 of Yen 30 billion (C\$260 million) was envisaged. In the 1988 MITI contribution was Yen 2.9 billion (C\$25 million), indicating a scaling down to about a half.
USE:	Seven manufacturers and 150 software house participate. Success is too early to evaluate, preliminary analyses show that the productivity increased 2.5 times, compared with an original target of quadrupling it.
LAST UPDATE:	February 1991

REF. # J-M-1

COUNTRY:

Japan

INITIATIVE:

Government Procurement

CATEGORY:

Marketing

GOAL:

Strengthen the indigenous industry

AGENCY:

MITI

DESCRIPTION:

In Japan, the Government (including local government) and public bodies are considered to be well advanced in the use of information technology. They account for more than ten percent (in value) of the country's computer stock. More significantly, it is they who have Japan's largest computer systems.

Government hardware and software are procured through an information intensive consultative system, structured around the Administrative Management Agency (AMA). But a decision regarded as being particularly important may be taken at the Cabinet level, by a deputy Minister, or by the Council of Directors in charge of Automatic Data Processing. The kind of decisions regarded as "important" have been related to:

- o Government computer procurement rules (requests for proposals);
- o "Unbundling" of hardware and software in public procurement;
- o Non-discriminatory treatment for foreign manufacturers.

Page 2

REF. # J-M-1

DESCRIPTION:

The Government gives high priority to small and medium-sized enterprises to benefit from public procurement. Each year, the Minister of International Trade and Industry draws up a paper on policy concerning small and medium-sized enterprises in connection with purchases by the government and other public bodies, published following approval by the Cabinet. This lays down annual targets for orders by the government and public bodies to small and medium-sized enterprises and determines what action should be taken to meet them. Both the government and public bodies are invited to co-operate. (In 1987, the share of small and medium-sized enterprises in total public procurement was 40 percent, with government purchases from these firms accounting for 43 percent of the total and those by public agencies 32 percent).

FUNDING:

N.A.

USE:

T.B.D.

LAST UPDATE:

March 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

EEC

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

EEC

The twelve member states of the European Community (Belgium, Denmark, France, united Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom), with a combined area of 2,392 thousand sq.km. and a population of 337 million people, have been emerging as the European trading bloc. Their combined GNPs have exceeded six trillion U.S. dollars.

The first European response to the alarming increases in the lag in the new technologies, grouped together under the label of "Eurosclerosis", came in the form of numerous Economic Community (ECC) programmes, designed to bring together research efforts of European companies.

At present, there are close to seventy different collaborative research programs, emanating from the EC. Only the most relevant major programs could be mentioned here.

The EC 1990-1994 Framework Program was approved in December 1989 with the budget close to C\$9 billion (an amount comparable in size with Canadian total yearly expenditures on R&D). Its predecessor, the 1987-1991 Framework Program has comprised eight fields of activity, ranging from quality of life to improvement of European Science and Technology cooperation.

The most relevant component of the Framework, is the European Strategic Programme for Research and Development in Information Technologies (ESPRIT). Conceived to help providing European industry with technological base for the nineties and promoting European cooperation in IT, its second phase ESPRIT II (1988-1992) has an impressive budget of \$2.5 billion (#EC-R-1). The program is focused into three thrusts in microelectronics, in information processing systems and in IT applications technologies. New emphasis is put on areas such as Application Specific Integrated Circuits, parallel-processing computers and workstations.

A three-times smaller program, RACE (Research and Development in Advanced Communications in Europe) (#EC-R-2), with a budget of some \$850 million for a five-year period, aims at creating Community's communication infrastructure for the next century.

The smaller EC programs, DRIVE, with a price tag of \$90 million, EURET with \$40 million and DELTA and AIM, at \$30 million each, are designed to catch up in use off informatics in road transportation, network transportation, education and medicine, respectively.

Information processing is also present in the BRITE/EURAM program, which, funded to the tune of \$750 million over five years, aims at modernization of manufacturing technologies.

In fact, information processing enters indirectly, into many other larger and smaller programs, such as TELEMAT, a program to improve remote handling of hazardous wastes, MAST, a program in marine science and technology, MONITOR, a program to identify new directions and priorities of R&D, DOSES, an effort to improve advanced statistical methods, VALUE, dealing with information diffusion, or EUROTRA, the European machine translation. Please note that this list is by no means exhaustive.

At least two other initiatives must be mentioned in even the briefest overview of collaborative programs.

) Initiated by French government in 1985, the EUREKA program (#EC-R-3) has been embraced by other European national governments, not only in the Community but also in the EFTA group. In fact, it will be Finland, that will chair EUREKA in 1991. The program, designed to bring together companies for collaboration in new technologies, has launched so far close to four hundred projects.

A new broad initiative in semiconductors, launched in 1989, called the Joint European Submicron Silicon (JESSI), is trying to help European chip manufacturers to stay in the semiconductor super race. JESSI architects argue that semiconductors are an essential enabling technology without which Europe cannot continue as a technologically sovereign entity. Lead by Dutch Philips, Italo-French ST (SGS/Thomson) and German Siemens, this huge C\$6 billion program (more than twice the size of the ESPRIT II Program), has started 50 projects, ranging from memory chips to high definition television.

The three private computer companies Siemens, Bull and ICL created in mid-1980s a private collaborative research institute ECRC (#EC-R-4).

Such cooperative research projects are seen by their proponents as reaping economies of scale from collaboration, removing wasteful duplication and prevent underinvesting in R&D, found often in individual companies. The critics, point out that the evidence shows that competition is by far more powerful force for stimulating innovation.

In other categories, the infrastructure segment includes the note on the EEC incubators #EC-I-1. In financing, the EIB loans (#EC-F-1) and ESCS loans (#EC-F-2) are set forth. The private but government sanctioned financing initiative, Euroventures, is profiled in #EC-F-3. In marketing segment, the brand new initiative EPHOS to create procurement guidelines is mentioned in #EC-M-1.

A second boost to increase European competitiveness came with the magic of 1992, leading to a near "Europhoria". It took a couple of years to sink in. The 1985 goal of uniting the markets of the European Community by the end of 1992 did not start to electrify the computer and communications industry until about three years ago. Let us keep in mind that the European computer hardware, software and telecommunications industries, were till then more or less sheltered in their national markets behind various, mostly protectionist, attempts of individual national technology policies. The industry started, at first very slowly, but more recently, with increased speed remoulding itself on continental scale. A wave of cross-border mergers, acquisitions, joint ventures and strategic alliances is now hitting the news daily.

However, the two 1990 blows - the purchase of ICL by Fujitsu and the retreat of Philips from one megabit S-RAM chips, plus the financial difficulties of nearly all the major players in European informatics, signal that the future of an independent European computer industry starts to look increasingly problematic.

REF. # EC-I-1	
COUNTRY:	EEC
INITIATIVE:	European Business and Innovation Centre Network (EBN)
CATEGORY:	Infrastructure
GOAL:	Help the start-up companies
AGENCY:	EBN
DESCRIPTION:	<p>In the Eighties, Enterprise Centres started to appear in Western Europe. More than thirty such centres have been created there. At the time of writing, the U.K. leads the effort with eleven centres, followed by Italy, with seven, and West Germany with five. France, Ireland and the Netherlands have created three centres each, so far. Belgium and Portugal have already such a centre, while Spain is in the process of creating its first business and innovation centre. All these centres are connected to the European Business and Innovation Centre Network (EBN) located in Brussels, Belgium. EBN was supported by the European Commission till 1988, when it became self-supporting. The EBN functions mostly as a clearing house for the exchange of information and experience.</p>
FUNDING:	T.B.D.
USE:	See above
LAST UPDATE:	February 1991

REF. # EC-F-1

COUNTRY:

EEC

INITIATIVE:

European Investment Bank (EIB)

CATEGORY:

Financing

GOAL:

Assisting companies willing to settle in assisted area

AGENCY:

EIB

DESCRIPTION:

These are low-and-fixed-rate loans extended by the independent, and non-profit-making, European Investment Bank (EIB). They can cover up to half of the fixed asset costs of a project. Repayment periods are usually eight years, but can be extended up to 12 years. A guarantee of repayment is required.

FUNDING:

T.B.D.

USE:

T.B.D.

LAST UPDATE:

February 1991

REF. # EC-F-2	
COUNTRY:	EEC
INITIATIVE:	ESCS Loans
CATEGORY:	Financing
GOAL:	Incentive to companies settling in an assisted area
AGENCY:	European Coal and Steel Community (ECSC)
DESCRIPTION:	<p>If the assisted area in question is suffering job losses caused by the re-organisation of either the coal or steel industries, then companies locating there can apply for a preferred-interest-rate loan from the European Coal and Steel Community (ECSC). Eligible companies need not be connected with either industry; any manufacturing or service company including software one, may qualify, as long as it helps create new employment.</p> <p>ECSC loans can cover up to half of the fixed asset costs of a project. They are normally for eight years with a four-year grace period for repayment of capital. A guarantee of repayment is required.</p> <p>ECSC loans are usually advanced in a mix of European currencies and must be repaid in those same currencies.</p>
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # EC-F-3

COUNTRY:

EEC

INITIATIVE:

Euroventures

CATEGORY:

Financing

GOAL:

Support the industry by venture capital

AGENCY:

Private Initiative

DESCRIPTION:

In 1984, ten of Europe's biggest companies -- Asea, Volvo, Philips, Bosch, BSN, La Farge Coppee, Saint-Gobain, Fiat, Pirelli and Olivetti -- announced that they were subscribing \$30 million to a new European fund called Euroventures. It started operations in 1985. This fund cloned further five venture funds of \$20 million, each in one of major European cities.

A major goal of pan-European venture capitalists is to overcome fragmentation in European capital market due to differing tax laws, stock market rules and regulations, and to encourage transborder syndication.

FUNDING:

See above

USE:

Below potential so far

LAST UPDATE:

February 1991

REF. # EC-R-1	
COUNTRY:	EEC
INITIATIVE:	European Strategic Programme for Research and development in Information Technologies (ESPRIT).
CATEGORY:	Overall
GOAL:	See below
AGENCY:	ECC: DG XIII
DESCRIPTION:	<p>Adopted in 1984, ESPRIT was conceived for a 10 year period with three main objectives: to help provide European IT industry with the technology base it needs to meet the competitive requirements of the 1990s, to promote European industrial cooperation in IT and to contribute to the development of internationally accepted standards.</p> <p>For the second phase of ESPRIT (ESPRIT II) the sectors for support have been adapted to the rapid pace of technological development and consolidated into three sectors: Microelectronics and peripherals, Information processing Systems and IT application Technologies. New emphasis is being placed on strengthening European capabilities in such areas as Application Specific Integrated Circuits (ASICs), high performance parallel processing computers and new office workstations. ESPRIT II also includes a new component, Basic Research Actions, designed to complement the main industrial programme.</p> <p>Duration: 1988-1992</p>
FUNDING:	ECU 1.6 billion, 1 ECU = C\$1.60
USE:	ESPRIT I:300 projects, all the projects are phased - cost programmes
LAST UPDATE:	February 1991

REF. # EC-R-2	
COUNTRY:	EEC
INITIATIVE:	RACE
CATEGORY:	Overall
GOAL:	Foundations of the communications infrastructure
AGENCY:	EEC: DG XIII
DESCRIPTION:	<p>RACE (Research and development in Advanced Communication in Europe) deals with the integrated roadband communications of the future. It is designed to lay the foundations of the community's communications infrastructures for the 1990s and into the 21st century, by combining the expertise of telecommunications researchers, manufacturers, administrations and broadcasting stations across European frontiers.</p> <p>Program duration: June 1987 - May 1992.</p>
FUNDING:	ECU 550 million, 1 ECU = C\$1.60
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # EC-R-3	
COUNTRY:	EEC
INITIATIVE:	EUREKA
CATEGORY:	Overall
GOAL:	To catch up in five to seven years with competitors in civilian high technologies
AGENCY:	EEC: Council of Ministers, Secretariat Eureka
DESCRIPTION:	<p>EUREKA is a French initiative launched in 1985 as a European civilian response to the U.S. SDI. Program involves the European Community and other European partners. Its aim is to stimulate cross-border cooperation in order to heighten Europe's productivity and competitiveness. Companies and research institutes in EUREKA member countries pool their efforts to develop leading-edge technology.</p> <p>EUREKA members are: Austria, Belgium, Denmark, FRG, Finland, France, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and Turkey. The chairmanship rotates, this year the chair is Finland's.</p> <p>EUREKA projects are: industry-led; involve at least two partners from different countries; use leading-edge technology; and secure a significant technological advance in the product, process or service concerned.</p> <p>EUREKA projects cover all scientific and technological fields. Special emphasis is placed on energy technology, medical and biotechnology, communications, information technology, transport, new materials, robotics and production automation, lasers and the environment.</p> <p>Unlike the EC programs, such as ESPRIT, RACE or BRITE, the projects are initiated by the industry and are co-sponsored by the national government funding, not EC.</p> <p>EUREKA is a priority project in Canada's strategy for technological co-operation with Europe. Several Canadian companies in fact have participated in Eureka projects, supported by "Going Global" program funds.</p>

Page 2

REF. # EC-R-3

FUNDING:

C\$8 billion

USE:

300 projects, 1,600 firms and research institutes

LAST UPDATE:

March 1991

REF. # EU-R-4	
COUNTRY:	EC
INITIATIVE:	European Computer Industry Research Centre (ECRC)
CATEGORY:	R&D
GOAL:	Pre-competitive research
AGENCY:	ECRC
DESCRIPTION:	<p>The European Computer Industry Research Centre GmbH (ECRC) in Munich is the joint Bull, ICL and Siemens research centre. It became operative in January 1984, with issued share capital of 1.8 million DM (over \$800 million). The new Centre is the first joint European data processing research venture created by industrial groups of their own initiative. There is no government participation. There are no formal links with EEC's ESPRIT program. It is not open to other companies. ECRC is incorporated as a non-profit limited company according to the German law. It is run by a board of seven directors, two from each participating companies and Dr. Gallaire, formerly with CGE in France.</p> <p>ECRC's budget was 14 million DM (close to C\$11 million) in 1985. The three founders committed themselves to three-year financing, with annual budgeting process.</p> <p>The Centre had 50 researchers by the end of 1985. Personnel was coming partly from the three mother companies, partly recruited from scientific institutes of the three countries.</p>
FUNDING:	See above
USE:	See above
LAST UPDATE:	March 1991

REF. # EC-M-1

COUNTRY:

EEC

INITIATIVE:

EPHOS

CATEGORY:

Marketing

GOAL:

Stimulation of software industry by procurement

AGENCY:

EEC

DESCRIPTION:

The EEC has proposed EPHOS, Government OSI Profiles (GOSIPs) as procurement guidelines for the Community agencies, to use in making purchases of computer software and hardware from vendors.

EPHOS is modelled on the UK version of GOSIP.

FUNDING:

Unknown

USE:

Not yet implemented

LAST UPDATE:

February 1991

**A SURVEY OF
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IN SELECTED COUNTRIES**

GERMANY

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

FEDERAL REPUBLIC OF GERMANY (FRG)

The Federal Republic of Germany, after the 1990 reunification, has a population of 79 million, living on 357 thousand sq.km. (smaller than Newfoundland). With a GNP of DM 2.45 (C\$1.9) trillion in 1990, per capita of over US\$21 thousand, the German economy is by far the largest economy of Western Europe.

The industrial structure of Germany is characterized by a close involvement of the banks in the industry. The Big Three (Deutsche, Dresdner and Commerz) control 70 percent of all proxies of publicly traded companies. The top ten companies represent a half, the top 20 nearly two thirds of the total capitalization. The three industrial pillars of the economy are the machine tools, cars and chemicals. FRG has a vibrant, dynamic small and medium enterprise, known as Mittelstand.

Germany has achieved world-class status in science and technology in the late nineteenth century. Ever since, it has been an innovation-driven economy. Strong in R&D - 2.87 percent of GNP was spent on R&D in 1987 - the German technological development strategy has been in the last number of years to move FRG from the traditional mechanical engineering base to the information engineering one. The strategy is to develop high-value-added products in the traditional sectors. However, the attempts to overcome slackening of transition to the new economy have been so far inconclusive.

The computer market of FRG is characterized by the strong penetration by imports, of both U.S. and more recently Asian origin. As a result of the defeat in World War Two, the Germans were relative latecomers into computer field. Today, the German industry is dominated by the largest European company, the SNI - the Siemens-Nixdorf group-which after the merger had in 1989 combined sales of over US\$9 billion. The SNI is of course part of the US\$33 billion Siemens, a giant with over 390 thousand employees, including over 30 thousand researchers and R&D expenditure of DM2 billions (C\$1.5) a year. The SNI is the weakest in the most dynamic segment - the micros.

The Software market in Germany in 1987 was 5.8 (C\$9.3) billion. The software products accounted for 44 percent of the market, that is ECU 2.8 (C\$4.5) billion. Over 55 percent of the market was supplied by the U.S. packages. The German software industry is composed of about 2,000 companies. In 1987, the largest company was the cooperative Datev, with sales of US\$245 million. The 1989 Datamation lists another German company Software AG, with 1988 sales of US\$237 million, the vendor of database software for mainframes and minicomputers, as the 50th largest non-US computer company. The concentration in the German industry is lowest in the EC - the top five vendors account for only 12 percent, the top ten for 18 percent of market share.

Faced with problems of falling behind in the transition from industrial to information-based economy, the government launched in 1984 the national DM 3 billion Informations Technik Program, aiming to catch up. It is described in more detail in #G-0-1. The program's initiatives concerning software are detailed in #G-0-2.

FRG has an impressive scientific and technological infrastructure. The research capabilities of AGF network, with GMD and KFAI Juelich is profiled in #G-I-1. The Max Planck Society is described briefly in #G-I-2. The Fraunhofer Society involved in applied research is profiled in #G-I-3.

The financing segment starts with the description of existing programs for loans and grants for smaller companies in #G-F-1. The grants for improving capabilities in Mittelstand are given in #G-F-2. Job creation subsidies in depressed parts of FRG are mentioned in #G-F-3. The traditional problem of the lack of the venture capital has been overcome in the last decade and a half by creation of WFG and of about 30 other venture funds. The top eight are listed (see #G-F-4 for more). The measures making self-financing easier by providing for employees building equity in their companies is touched upon in #G-F-5.

In the tax section, the relevant features of the tax reform 1990 are mentioned (#G-T-1).

The human resources, like in other reviewed countries, are a challenge for the SP industry. the Software Technician part of Vocational Training program is set forth in #G-H-1.

Many of the initiatives for product development in the software product companies are increasingly more driven by government efforts of individual Laender. Bavaria and Baden-Wuerttemberg are leading in the drive to develop high tech companies, many of them software ones. The area around Munich in Bavaria is being referred to as a Silicon area of FRG. Of the numerous interesting initiatives only the technology transfer organization in Baden-Wuerttemberg, the Steinbeis Stiftung, may be described in more detail (#G-R-1). The program of subsidies for R&D in smaller companies are sketched in #G-R-2. The Technologie-zentren, incubators for start-up companies, such as BIG and SITZ, popular with software companies, are mentioned in #G-R-3.

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FEDERAL REPUBLIC OF GERMANY (FRG)

The government helps the SP companies by procurement, described in #G-M-1. The treble support for international cooperation is mentioned in #G-M-2.

Last Update: February 1991

REF. # G-O-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Informations Technik Program
CATEGORY:	Overall
GOAL:	Bring FRG to the forefront of high technology industries
AGENCY:	Ministry of Research and Technology (BMFT)
DESCRIPTION:	<p>There has been a strong concern in FRG since 1980 about the way in which the country has fallen behind the USA and Japan in information technologies. By 1983/4, it developed into the fear that FRG was sliding into the second tier of industrialized nations. In response, the Federal Government unfolded in 1984 its 3 billion DM five-year national plan to bring FRG to the forefront of high technology industries. The industry was expected to provide 6 billion DM, that is 2:1 leverage in this period.</p> <p>Some 600 million DM of government funds was dedicated for advanced computer systems and 500 million DM for advanced software (#G-0-2).</p> <p>By the end of the five-year period, the fear of sliding by and large subsided.</p> <p>The 1989 follow-up program, entitled "Information Technology: a Concept for the Future", involves providing further support of the research, the deregulation of telecommunications sector, and increased R&D cooperation under programs such as ESPRIT II, DRIVE and DELTA.</p>
FUNDING:	C\$2.3 billion
USE:	Extensive
LAST UPDATE:	February 1991

REF. # G-O-2	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	National Plan: Software
CATEGORY:	Overall
GOAL:	Bring FRG to the forefront of software industries
AGENCY:	Ministry of Research and Technology (BMFT)
DESCRIPTION:	<p>Part of the National Plan (#G-O-1), launched by the federal government in 1984, the DM500 million of government funds was dedicated for advanced software.</p> <p>Important parts, DM200 million was dedicated to knowledge processing and pattern recognition. Most importantly in the present context, DM160 million was poured into software engineering or as it was called CAD software.</p>
FUNDING:	C\$385 million
USE:	Extensive
LAST UPDATE:	February 1991

REF. # G-I-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	AGF
CATEGORY:	Infrastructure
GOAL:	Long-term R&D
AGENCY:	AGF
DESCRIPTION:	<p>Thirteen national research centres are joined under the Association of National Research Centres (AGF).</p> <p>The National Research Centres cooperate closely with universities and non-university research institutions both foreign and domestic, as well as industry. Many of the scientists working at national research centres are faculty members at a university in their host states. AGF also cooperates with industry in large projects based on contract agreements or joint development.</p> <p>With an annual budget of more than two billion DM, the Association members employ 16,000 people, 4,000 of whom are research scientists.</p> <p>The software development work is concentrated in the Gesellschaft fuer Mathematik und Datenverarbeitung (GMD) in St. Augustin near Bonn.</p> <p>The new Information Technology Research Centre at KFA Juelich is to supplement R&D carried out at GMD.</p>
FUNDING:	See above
USE:	Frequent
LAST UPDATE:	February 1991

REF. # G-1-2	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Max-Planck-Gessellschaft (MPG)
CATEGORY:	Infrastructure
GOAL:	Advancement of Science
AGENCY:	MPG
DESCRIPTION:	<p>The MPG, or the Max-Planck Society, is devoted to the advancement of the sciences. Comprised of 60 research institutes, the MPG is the largest research organization in the Federal Republic of Germany. The institutes, usually located either in or close to universities, are intended to complement the research performed there and to establish priorities in basic research, the natural sciences, social sciences and humanities.</p> <p>The MPG has an annual budget of approximately 900 million DM. Ninety percent of funding is provided by the federal and the Laender governments. The balance comes from membership fees, donations, legacies and patents. The MPG employs approximately 8,500 people. In addition, some 2,400 guest scientists from Germany and abroad work at MPG facilities.</p>
FUNDING:	See above
USE:	N.A.
LAST UPDATE:	February 1991

REF. # G-I-3

COUNTRY:

Federal Republic of Germany (FRG)

INITIATIVE:

Fraunhofer Society (FhG)

CATEGORY:

Infrastructure

GOAL:

Applied Research Organization

AGENCY:

FhG

DESCRIPTION:

The Fraunhofer-Gesellschaft or Fraunhofer Society is a non-profit organization devoted to the advancement of applied research. FhG maintains 35 research institutes in eight federal states with a staff of about 5,000, one-third of whom are scientists and engineers. FhG activities cost approximately 600 million DM to fund, 70 percent of funding is from the government. Most research is performed on contract with government agencies and private industry. Cooperative research projects are also undertaken to solve problems encountered by government clients or private sector

FUNDING:

See above

USE:

Increasing links with industry

LAST UPDATE:

February 1991

REF. # G-F-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Loans and Grants
CATEGORY:	Financing
GOAL:	Provide capital to small companies
AGENCY:	Kreditanstalt fuer Wiederaufbau
DESCRIPTION:	<p>In order to mitigate the handicap arising from the difficulties encountered by small and medium-sized enterprises in gaining access to the financial market compared with larger firms, fixed capital formation is facilitated through public loans. However, these public loans may be granted only as partial financing of a product. In time, the resources of the Marshall Plan (ERP) became increasingly focused on programmes for small and medium-sized enterprises. Half the annual volume of assistance of this type is now targeted to such firms. Under ERP programmes for setting up enterprises, small and medium-sized enterprises in 1988 received approximately DM2.5 billion in the form of public loans.</p> <p>Refinancing aid, supplied by the Federal Government, exists for companies set up to provide equity capital to small and medium-sized enterprises.</p> <p>Finally, the start-up of Capital Aid Scheme, since 1979 administered by the Lastenausgleichsbank, provide a 20-year fixed interest loan to new companies. The average loan has been DM30,000 (C\$23,000).</p> <p>The Technology-Oriented Creation of New Enterprises program, administered since 1983 by BMFT, provides high tech companies of less than three years of age, with grants of 75 percent for development costs (up to DM900,000) and of 90 percent for feasibility study costs (up to DM54,000). Total outlay has been estimated at about DM75 million a year in 1986.</p>
FUNDING:	See above
USE:	Most frequent
LAST UPDATE:	February 1991

REF. # G-F-2	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Improve the Mittelstand
CATEGORY:	Financing
GOAL:	Improve the Mittelstand
AGENCY:	BMFT/BMWI/RKW/BGW
DESCRIPTION:	<p>The Federal government (Federal Ministry of Research and Technology - BMFT - and Federal Ministry of Economics - BMWI) finances 91 percent of the assistance given to improve the skills and know-how of the SME as against 9 percent in the case of the Lander. Federal government support is of various types:</p> <ul style="list-style-type: none"> o Discretionary support for certain projects, in cases where projects may lead to the introduction of new technologies on the market. The amounts provided for grants of this type have decreased in recent years both for industry in general and for the SMEs (from about DM243 million to 150 million between 1980 and 1986); o Support for the diffusion of new technologies to firms as a whole in the form of "indirect specific aids". While this assistance is not reserved to SMEs, the latter are the firms primarily concerned, since financing can be given to an enterprise for only one project and since the ceilings are rather low. Schemes are of limited duration and have been set up successively, in line with technological developments; o Counselling assistance, the principal forms of which are: <ul style="list-style-type: none"> - grants to SMEs by the Rationalisation Commission of the German Economy (RKW), which cover 40 percent of the counselling costs, and by the Federal institute of industrial economics (BGW);

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REF. # G-F-2

DESCRIPTION:	<ul style="list-style-type: none">- the financing which has been granted for past ten years for the establishment of counselling units on innovation, in SMEs (these units have been set up in public or semi-public bodies such as the Chambers of Commerce and Industry, branches of the RKW, etc);o R & D Support aimed at assisting SMEs to recruit researchers and commission research.
FUNDING:	See above
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # G-F-3	
COUNTRY:	Federal Republic of Germany
INITIATIVE:	Replacement jobs
CATEGORY:	Financing
GOAL:	Create jobs in depressed areas
AGENCY:	BMWI
DESCRIPTION:	<p>The Federal government uses regional policy aid as a means of encouraging technical progress and promoting innovation in small and medium-sized enterprises. A total of DM101 million were allocated to this effect in 1988.</p> <p>Efforts are being made to create replacement jobs in areas affected by the decline in coal mining (Aachen, Juelich) or the iron and steel industry (Ruhr). In the 1989-1993 period, DM100 million are made available in the former, and DM500 million in the latter area.</p> <p>Software product companies creating jobs in these areas are eligible.</p>
FUNDING:	See above
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # G-F-4

COUNTRY:

Federal Republic of Germany (FRG)

INITIATIVE:

Access to Venture Capital

CATEGORY:

Financing

GOAL:

Provide access to venture capital

AGENCY:

Ministry of Research and Technology (BMFT)

DESCRIPTION:

Germany had a long tradition of virtual absence of venture capital (wagnis kapital). In the first half of 1980s, the government promoted setting up of the venture capital funds, as the essential ingredient for developing high tech companies.

Even before that, the government backed setting up of the WFG Deutsche Gessellschaft, a large capital pool of DM180 million, where 35 banks and other financial institutions participate. The government undertook to cover 75 percent of losses which indeed occurred, at least in the first dozen investments.

By 1990s, FRG has about 30 venture capital pools, a good quarter of them in Berlin. Most were created in the first half of 1980s. Among the leading VC funds today are:

Fund Managers	Range of Individual Investments considered (all figs. in ECU '000)		Company Development Stage	
	Min.	Max.	Start Ups	Develop- ment
Deutsche Beteiligungsgesellschaft	238	19,000	Y	Y
Genes Gmbh Venture Services	250	2,500	Y	Y
IDP Industrial Development Partners	225	1,500	N	Y
Matuschka Gruppe	500	500,000	N	Y
Neu-Europa Hitec & Biotech	225	3,000	N	Y
Technologieholding VC	250	2,500	Y	Y
TIG Technologie Investitions	250	2,000	Y	Y
TVM Techno Venture Management Gmbh & Co KG	225	2,500	N	Y

Despite the emergence of VC funds, the new business formation has not yet been impressive. The traditional risk-aversion, employee rather than entrepreneur mentality has prevented the creation of but the few important new companies.

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REF. # G-F-4

FUNDING:	See above, Note: 1 ECU is approx. C\$1.60
USE:	Only about 10 percent of the potential actually used
LAST UPDATE:	February 1991

REF. # G-F-5	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Mittbestimmung
CATEGORY:	Financing
GOAL:	Self-financing of small companies
AGENCY:	T.B.D.
DESCRIPTION:	<p>The reform undertaken by the Federal Government allowing employees to build up assets, in accordance with the 1983 Act on the participation of employees and the recent decision to direct this policy towards participation of employees in equity, may help to reduce the specific disadvantage of small and medium-sized enterprises in self-financing.</p>
FUNDING:	N.A.
USE:	Frequent
LAST UPDATE:	February 1991

REF. # G-T-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Tax Reform 1990
CATEGORY:	Taxation
GOAL:	Make German companies more competitive
AGENCY:	
DESCRIPTION:	The tax reform of 1990 aims at reducing the rate of tax on retained earning from 56 to 50 percent, a reduction of 3 percent on the maximum tax rate for unincorporated companies, to compensate discontinuing tax exemptions for R&D and regional development.
FUNDING:	N.A.
USE:	N.A.
LAST UPDATE:	February 1991

REF. # G-H-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Software Technicians
CATEGORY:	Human Resources
GOAL:	Introduce new technologies into vocational training
AGENCY:	BMFT
DESCRIPTION:	<p>By mid-1980s, the government started a pilot program to introduce new technologies into the traditionally impressive vocational training courses. The DM20-25 million was spent on 20-25 projects in industry and in training institutes. This initiative has a potential to bring the software technicians into the software product industry.</p>
FUNDING:	DM20-25 million
USE:	Average
LAST UPDATE:	February 1991

REF. # G-R-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Steinbeis Stiftung
CATEGORY:	R&D
GOAL:	Technology transfer to SME
AGENCY:	Ministry of Economics Baden-Wuerttemberg
DESCRIPTION:	<p>The Steinbeis Stiftung (Foundation) was created in Baden-Wuerttemberg to assist with technology transfers into smaller and medium-sized enterprises of this state.</p> <p>The organization has 100 centres in 26 locations throughout the state with 600 professors and 600 engineers. The foundation is involved in close to 16 thousand transfer projects, 3.5 thousand of which are in fact research projects. The funding is 90 percent from fees for services, 10 percent government grants. The organization has also ten regional incubators for start-up companies.</p>
FUNDING:	In 1989, DM64 (C\$50) million
USE:	16 thousand projects/year
LAST UPDATE:	February 1991

REF. # G-R-2

COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Subsidizing R&D personnel costs
CATEGORY:	R&D
GOAL:	Increase industrial R&D inn the Mittelstand
AGENCY:	BMFT, BMWI
DESCRIPTION:	<p>In support of R&D, FRG relied on 90 percent grants and 10 percent tax concession. The latter have been cut back in the 1990 tax reform.</p> <p>As far as grants are concerned, the BMWI (German Ministry of Economics) assisted the R&D activities of Mittelstand (small and medium-sized enterprises) by subsidising (through grants) the salaries of R&D personnel (Programme I). The personnel subsidy Programme I involved nearly 19,000 enterprises with over DM3 billion in subsidies, and the programme contributed to increased R&D across all industrial sectors. Over one-half of firms participating in Programme I had less than 100 employees. It is estimated that in the early part of the programme additional R&D and innovation expenditures amounted to 60 percent of government programme funds.</p> <p>From 1985 to 1990 BMFT (the Ministry for Research and Technology) also promoted the growth of research personnel in SMEs (Programme II). The Programme II was used by about 20,000 enterprises over 1985-89. Firms that participated in the R&D personnel growth promotion Programme II showed stronger growth in R&D personnel compared with firms that only participated in the general scheme (Programme I). However, most of this growth could be attributed to firm and market characteristics.</p>
FUNDING:	Total DM730 (C\$560) million in 1989
USE:	25,000 SME companies now conduct their own R&D
LAST UPDATE:	February 1991

REF. # G-R-3	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Technologie-Zentren
CATEGORY:	R&D
GOAL:	Incubate start-up companies
AGENCY:	Multiple
DESCRIPTION:	There are over 70 Technologie-zentren (incubators) around the country. The first, BIG was built in their West Berlin, others are in Saarbrücken (SITZ), Hamburg, Hannover, Dortmund, Cologne, Stuttgart, Munich and in the countryside. The government-supported centres typically provide space for a dozen or more start-up companies, many of them software product ones.
FUNDING:	Varies with individual centres
USE:	Increasingly popular
LAST UPDATE:	February 1991

REF. # G-M-1	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Government procurement
CATEGORY:	Marketing
GOAL:	Help the software companies by procurement
AGENCY:	KBSt
DESCRIPTION:	<p>Each federal ministry is solely responsible for its procurement. Uniformity amongst federal authorities is, however, guaranteed by universal provisions stipulated in the contracting rules for the award of contracts (VOL/A) and in the budget law. In addition, software problems of general interest are dealt with by the Inter-Ministerial Co-ordination Committee for Data Processing (IMKA), which comprise members of all departments. Furthermore, through its participation in procurement measures on the basis of budget provisions the Office of Co-ordination and Consultation for Administrative Data Processing (KBSt) can act as the principal agency for the promotion of uniform procurement procedures. KBSt participation consists, above all, of issuing written statements on procurement measures as regards organisation and data-processing techniques. The KBSt also collects and disseminates information on software products and advises federal authorities as part of its market research and advisory role. Public authorities (Federal Government, Laender, local authorities) also co-operate in order to set up common technical standards.</p> <p>There exists also a legislative provision for a "second chance" tender favouring small and medium enterprises.</p>
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # G-M-2	
COUNTRY:	Federal Republic of Germany (FRG)
INITIATIVE:	Treble Support
CATEGORY:	Marketing
GOAL:	Promote international cooperation
AGENCY:	Federal Office for Foreign Trade Information
DESCRIPTION:	<p>The effort to promote international industrial co-operation is focused on the provision of information concerning opportunities for business co-operation.</p> <p>In the "treble support" approach, the German Embassies, Chambers of Industry and Commerce and the Federal Office for Foreign Trade Information join forces.</p>
FUNDING:	T.B.D.
USE:	Frequent
LAST UPDATE:	February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

FRANCE

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

FRANCE

France, a country where 56 million people live on the largest European territory (544 thousand sq.km.), is the second strongest Western European economy, after Germany. With a 1990 GNP of FF6,465 billion (US\$1.3 trillion or C\$1.5 trillion), nearly US\$23 thousand per capita, the "Hexagon" is the fourth largest OECD economy.

Marked by Colbertian tradition, France's industrial structure has been characterized by the large public sector, which despite recent privatization wave still accounts for about 25-30 percent of the economy. The well-known multibillion multinationals, based on high technologies, such as Thomson or Bull, have remained in state hands.

The French technology development policy has been until recently highly interventionist, "dirigist", with emphasis on instruments of planning. The great emphasis has been also placed on concerted action, involving all the social agents - government, industry, academia and labour. France spent 2.3 percent of GNP on R&D in 1987. The target of 3 percent has been sought. The technological development strategy aiming at becoming "Number Three" - after U.S. and Japan - has been in place for some time. Nevertheless, France, has seen her competitiveness in high technology industries eroded. The achievements show, that to date the policy has been richer in instruments than in strategy formulation and above all strategy implementation. The most recent policy thrusts have been therefore towards internationalization, decentralization and increased support of small and medium enterprises.

The French computer market is characterized by a substantial (over one third) import penetration, by the U.S. and more recently by the Asian products. The French industry is dominated by the financially troubled Groupe Bull, with 1990 sales of US\$5.2 (C\$6) billion and 43 thousand employees. While Bull has succeeded to keep the number three European market share position in mid-range (9 percent) and mainframe machines (7 percent), it has been much less successful in the largest, micro segment. Faced with 1990 losses in the Groupe Bull of at least FF 3 billion (C\$700 million), the traditionally nationalistic government, in a dramatic reversal, has encouraged the former national champion to seek a European partner.

In the software sector, absence of the official EEC statistics on software market and industry requires that the private estimates of IDC and Input have to be relied upon. Unfortunately, there is a disagreement between the estimates of the two firms. IDC estimated the software and services revenue in 1987 to be 6 billion ECU (over C\$9 billion). According to Input, the market is in fact about a quarter larger. Accepting the more conservative estimate, if software products accounted for 30 percent, the French market was about 2 billion ECU (C\$3.2 billion). Over a half of the software product market was supplied by imports from the USA.

The French software industry is the world's third producer of software and the leading industry of Europe. It employs over 40 thousand people. The industry is lead by the largest European software company Cap Gemini Sogeti, a group with 1990 sales of over FF 9 (over C\$2) billion and profits of FF 615 (C\$140) million, up 17 percent. Furthermore, according to 1988 sales, Sligos (C\$400 million), GSI (C\$300 million) and CISI are among the top dozen software companies of Europe. Sligos and GSI focus on software products. Leading twelve French software companies operate throughout Europe and have gained a foothold in the North-american market. They produce about 60 percent of all software in France. Each of the companies employs well over 1,000 employees.

The French have been traditionally strong in very large administrative-management software. One tenth of world's data banks are French. A notable achievement of the French was the development of the ADA language by a team at Groupe Bull.

To provide cohesion to the national effort in informatics the French government kicked off in 1983 the Plan d'action Filiere Electronique (#F-0-1). One of the national projects was EPICEA (#F-0-2).

France has developed a formidable technological capability in software. The CNRS research institute, with 25 thousand scientists, is described in #F-I-1. The applied research laboratory in informatics, INRIA, is profiled in #F-I-2. The ADI agency, designed to promote software development, is listed under #F-I-3.

The initiatives to decentralize French technological capability have lead to developments of a number of technopoles, away from the dominant Ile-de-France. The two oldest and most successful, Sophia Antipolis (#F-I-4) and ZIRST Meylan (#F-I-5), are profiled in more detail.

In financing, a chronic problem for software companies, the government shifts from grants to tax concessions (#F-F-1). The ANVAR agency charged with commercialization of research is profiled in (#F-F-3). The attempts to develop venture capital market is described in more detail in (#F-F-4). The relevant tax relief measures are listed in #F-T-1.

France is no exception in facing shortages of software specialists. The software training school CERICS is touched upon in #F-H-1. The CIFRE scheme, designed to provide postgraduate students with work in the industry, is mentioned in (#F-H-2). The scheme for training entrepreneurs is in #F-H-3.

The effort to streamline tech transfer to SME is outlined in #F-R-1. The decentralization programs are briefly mentioned in #F-R-2. The partnership program CREATI, linking the small companies with the large ones is described in #F-R-3. The university to industry transfers are listed in #F-R-4. The GIP program for creating consortia is mentioned in #F-R-5. The #F-R-6 provides information about CRITT, a mechanism for tech transfer from government laboratories to industry. Finally, in #F-R-7 the international programs are mentioned.

The marketing of software is helped by the government procurement. Its extend is discussed in #F-M-1. The Logic program of ADEPA is discussed next in #F-M-2. The export promotion aid of COFACE is listed in #F-M-3. The services of NOREX are described in #F-M-3.

Last Update: February 1991

REF. # F-0-1	
COUNTRY:	France
INITIATIVE:	Filiere electronique (PAFE)
CATEGORY:	Overall
GOAL:	Number Three in Informatics
AGENCY:	Ministere de la recherche et la technologie
DESCRIPTION:	<p>Plan d'action Filiere Electronique (PAFE) was the 1983 five-year attempt by the Mitterand administration to pull together the diverse initiatives of the French high technology establishment. To this end \$1.8 billion (40 percent coming from the government) was funnelled into the industry.</p> <p>The institutional coordinating nevertheless remain a problem. One of the six national research projects was EPICEA (#F-0-2).</p> <p>Individual initiatives are described in more detail on all the following pages.</p>
FUNDING:	In mid-eighties, FF700 (C\$160) million a year
USE:	See individual initiatives
LAST UPDATE:	February 1991

REF. # F-0-2	
COUNTRY:	France
INITIATIVE:	EPICEA
CATEGORY:	Overall
GOAL:	Develop a universal software engineering system
AGENCY:	MRT
DESCRIPTION:	<p>The national software engineering project is one of six priority research projects launched as part of the Plan d'Action Filiere Electronique (PAFE), for details of which see Ref.#F-0-1.</p> <p>The aim is to develop a universal software engineering system, called EPICEA (Environnement de Programmation Industriel pour la Conception et l'Etude des Applications), involving the key software players of the country.</p> <p>The emphasis has been on horizontal co-operation between various research institutes and companies.</p>
FUNDING:	The government support in the first year, 1984, amounted to FF 30 million (C\$7 million). The same amount was allocated to the initiative in 1985.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-I-1	
COUNTRY:	France
INITIATIVE:	CRNS
CATEGORY:	R&D
GOAL:	Superior R&D Capability
AGENCY:	CRNS
DESCRIPTION:	<p>CRNS (Centre National de la Recherche Scientifique) is the largest basic and applied research organization in France, with the staff of 24,500 people, some 10,000 researchers and 14,500 support personnel. CRNS is organized into 1,500 units. It reports to the Ministry of Research and Industry. Its mandate is to stimulate and carry out research and facilitate technology transfer by:</p> <ul style="list-style-type: none"> - performing joint research projects with industry; - issuing licenses for developments produced within CNRS; - creating small businesses to develop particular projects; - seconding researchers to private companies; - carrying out consultation for industry; - providing training for technologists in particular technologies; - providing a data bank service which answers inquiries from industry on particular technologies; - an industrial relations committee (CRIM) where researchers and industry develop strategies for new technologies; and - providing information services for new technologies. <p>CNRS supports several networks, called GRECO, that link people in informatics.</p>
FUNDING:	Estimated to be in the C\$1.5 billion range.
USE:	N.A.
LAST UPDATE:	February 1991

REF. # F-I-2	
COUNTRY:	France
INITIATIVE:	Institute National de Recherche en Informatique et en Automatique (INRIA)
CATEGORY:	R&D
GOAL:	Applied Research Laboratory in Informatics
AGENCY:	INRIA
DESCRIPTION:	<p>Founded in 1980, INRIA is a government applied research laboratory, reporting to the Ministere de la Recherche et de la Technologie. It has four basic missions.</p> <ul style="list-style-type: none"> o applied research o development of experimental systems o international research exchanges o vertical technology transfers. <p>INRIA has 160 own researchers, working on about 40 projects. In addition, numerous invited academics, fellows, professionals or people on executive exchange more than double the size of the staff.</p> <p>Furthermore, some 75 researchers come each year from abroad, including Canada, to a total of 460 people. They are located in three Centres: Rocquencourt, Rennes and Sophia.</p> <p>The research work is organized around eight grand themes:</p> <ol style="list-style-type: none"> 1) modelling, numerical software 2) system automation 3) processing of data and images (incl. robotics) 4) programming and algorithms 5) languages and standards 6) computer systems 7) man-machine communications 8) new architectures, specialized machines.
FUNDING:	In the order of \$30 million
USE:	N.A.
LAST UPDATE:	February 1991

REF. # F-I-3	
COUNTRY:	France
INITIATIVE:	Agence de l' Informatique (ADI)
CATEGORY:	R&D
GOAL:	Promote development of software
AGENCY:	ADI
DESCRIPTION:	<p>ADI was created in France in 1980 to promote the development and applications of informatics. With a staff of 120 professionals, and the budget of 380 million FF (over C\$85 million) - 80 percent of which comes from the PTT - the agency spends one-third of its funds on research, one-third on applications and one-quarter on training.</p> <p>In research, the agency spends some \$20 million annually in grants and leads the pilot projects (such as KAYAK, NADIR, SIRIUS, SOL, SURF or RHIN).</p>
FUNDING:	See above
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-I-4	
COUNTRY:	France
INITIATIVE:	Sophia-Antipolis
CATEGORY:	Infrastructure
GOAL:	Create a technopole
AGENCY:	Foundation Sophia - Antipolis
DESCRIPTION:	<p>The oldest technopole of France, Sophia-Antipolis was started in 1969. Located just north of Nice, it is not too far from the Mediterranean coast. On 2,300 ha, the park groups over 700 businesses, among them high tech industrial enterprises, such as Thomson, or French government research laboratories, such as CRNS or INRIA, in total employing more 12,500 people. The futuristic complex, in a relaxed, park-like setting, that boasts a golf course, has been built as an intelligent city, with 200 km. of fibre optic cable underground. The technopole aims with great determination to attract foreign investors. The complex attracted 160 foreign companies, among others U.S. companies such as DEC, IBM and NCR. About 130 companies are in informatics, three scores in software.</p> <p>The target companies are entitled to business creation (PRCE) loans from C\$30 thousand to C\$100,000, and development (PRSD) loans from C\$20,000 to C\$200,000. They can also receive upto 50 percent loan guarantees from the FRAC regional funds.</p>
FUNDING:	US\$200 million: infrastructure, government subsidies are at FF12 (C\$2.5) million a year level
USE:	See above
LAST UPDATE:	February 1991

REF. # F-I-5	
COUNTRY:	France
INITIATIVE:	ZIRST/Meylan
CATEGORY:	Infrastructure
GOAL:	Create a technopole
AGENCY:	Prozirst
DESCRIPTION:	<p>La Zone pour l'innovation et les realisations scientifiques et techniques (ZIRST) in Meylan, the second oldest technopole of France, in Meylan near Grenoble, was started in 1974.</p> <p>The technopole, specializes in informatics, electronics and automatization. Over 150 enterprises, employing close to 4,000 people, have come to this technopole.</p> <p>Unlike in Sophia Antipolis, the links to the strong academic institutions such as the University of Grenoble and Grand Ecoles of Rhone-Alpes, with a pool of 10,000 researchers, are in place.</p>
FUNDING:	Over US\$150 million
USE:	See above
LAST UPDATE:	February 1991

REF. # F-F-1	
COUNTRY:	France
INITIATIVE:	Government Financial Aid
CATEGORY:	Financing
GOAL:	Help the SW industry
AGENCY:	Ministry of Research and Technology (MRT)
DESCRIPTION:	<p>The French government has relied on the following mix of instruments.</p> <ul style="list-style-type: none"> - 50 percent grants - 25 percent repayable grants - 25 percent tax concessions
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-F-2	
COUNTRY:	France
INITIATIVE:	ANVAR
CATEGORY:	R&D
GOAL:	Commercialization of French R&D
AGENCY:	Ministere de la Recherche et de la Technologie Ministere de l'Industrie
DESCRIPTION:	ANVAR, Agence Nationale de Valorisation de la Recherche, is a national corporation set up at the end of 1968 with an independent economic statute and run on a commercial basis. The mission is to commercialize inventions resulting from French research: bring the inventions to the stage of industrial application and to disseminate them throughout the French economy. It provides also direct financial assistance to companies for research and innovation. The amount was FF800 (close to C\$200) million in 1987. ANVAR's field of operation is not limited to France. It grants licenses not only to French, but also to foreign companies in France and abroad. The Agency today negotiates not only patents but is involved in all types of technology transfers, including computer software. The staff was over 430 in 1987.
FUNDING:	1984 budget was FF500 million (C\$114 million)
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-F-3

COUNTRY:

France

INITIATIVE:

Develop venture capital market

CATEGORY:

Financing

GOAL:

Provide innovation-based companies with access to risk capital

AGENCY:

Ministere de la Recherche et de la Technologie

DESCRIPTIONS:

The efforts of the French Government to develop domestic venture capital market have had three thrusts:

1) Creating public venture capital funds

The government set-up several companies for funding innovation, such as Sofinnova and Soginnove. 50 percent of investment is tax deductible.

2) Supporting private venture capital pools

The government has offered tax incentives and guarantees against risk (of up to 60 percent) to such companies.

3) Development of the junior market

The "marche seconde" was created in 1983. Few of the software product companies have, however, been traded on this market.

DESCRIPTION:

Some of the leading VC funds are listed below:

<u>Fund Managers</u>	<u>Range of Individual Investments considered (all figs. in ECU '000)</u>		<u>Company Development Stage</u>		
	<u>Min.</u>	<u>Max.</u>	<u>Start Ups</u>	<u>Develop-ment</u>	<u>Manbuy Out/In</u>
Alan Patricof Associes	150	3,000	Y	Y	N
Alpha Associes	714	2,857	N	Y	Y
Banexi	75	10,000	Y	Y	Y
Compagnie Financiere du Scribe	150	2,250	Y	Y	N
Edelson Technology Partners	80	1,600	Y	Y	Y
Epargne Partenaires	500	20,000	N	N	Y
Euroventures France	300	1,500	N	Y	N
Finovelec	100	1,000	Y	N	N
Idianova	15	3,000	Y	Y	N
Innolion	73	730	Y	Y	N
Paribas-Departement					
Capital Risque	150	15,000	N	Y	N
Siparex	150	3,000	N	Y	Y
Sofinnova	500	3,000	Y	Y	N
Soginnove	145	1,000	Y	Y	N
Suez Ventures	150	1,000	Y	Y	N
Thomson-CSF Ventures	150	1,500	Y	Y	N

FUNDING:

See above, 1 ECU = C\$1.60

USE:

Not yet fully developed

LAST UPDATE:

February 1991

REF. # F-T-1	
COUNTRY:	France
INITIATIVE:	Tax relief
CATEGORY:	Taxation
GOAL:	Make French companies more competitive
AGENCY:	Finance
DESCRIPTION:	<p>In 1990, the government reduced the tax burden on the companies further by reducing the corporation tax to 37 percent, from 50 percent in 1986.</p> <p>A 25 percent training tax credit was introduced, with a ceiling of FF 1 million (C\$228 million), see Ref.#F-H-2.</p> <p>The research tax credit appropriation was increased by FF 500 million in 1988, further strengthened afterwards, to cover 50 percent of the <u>increase</u> in the R&D effort.</p>
FUNDING:	Partially see above
USE:	Popular
LAST UPDATE:	February 1991

REF. # F-H-1	
COUNTRY:	France
INITIATIVE:	CERICS
CATEGORY:	Human Resources
GOAL:	Close the gap between supply and demand of software specialists by training.
AGENCY:	T.B.A.
DESCRIPTION:	<p>Software training is performed both in school and on-the-job settings.</p> <p>Established in the early 1980s, a specialized software training school CERICS was created to help to alleviate the critical shortage of software specialists.</p> <p>Similar to the Swiss Software School, CERICS is independent of computer science faculties. It specializes exclusively on software engineering. It is located in Sophia Antipolis (#F-I-4).</p> <p>The software specialists are also trained on-the-job. The French companies allocate on average six percent of payroll to in-service training for their staff. In 1989, the government introduced a 10 percent training tax credit, with a ceiling of FF1 million (C\$228 million) (#F-T-1).</p> <p>The inflow of candidates for both types of training was being helped by the French government initiative to open 11,000 workshops, each with at least seven microcomputers, throughout the educational system of France. To put this figure in perspective, there are close to 59 thousand primary, secondary and vocational schools in the country. The total cost of the plan was FF2 billion (C\$450 million).</p>
FUNDING:	See above
USE:	Widely used
LAST UPDATE:	February 1991

REF. # F-H-2

COUNTRY:

France

INITIATIVE:

CIFRE

CATEGORY:

Human Resources

GOAL:

Strengthen the R&D capability of firms

AGENCY:

Ministry of Research and Technology (MRT)

DESCRIPTION:

The MRT funds agreements between universities and companies to have post-graduate students perform the research for these in the industry, on salary basis.

Eligible candidates have to complete at least five years of university studies.

FUNDING:

FF200 (C\$44) million a year

USE:

About 400 a year

LAST UPDATE:

February 1991

REF. # F-H-3	
COUNTRY:	France
INITIATIVE:	Agence national pour la creation d'entreprises (ANCE)
CATEGORY:	Human Resources
GOAL:	
AGENCY:	ANCE
DESCRIPTION:	<p>The Agence national pour la creation d'entreprises (ANCE) provides the entrepreneurs forming new companies with information and counselling.</p> <p>The training of entrepreneurs has been performed by the Chambers of Commerce. The Economic Schools in France have also become involved in such training.</p>
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-R-1	
COUNTRY:	France
INITIATIVE:	Technological transfer to SMEs
CATEGORY:	R&D
GOAL:	Increased competitiveness of small companies
AGENCY:	Multiple
DESCRIPTION:	<p>Action designed to ensure that useful application is made of the results of public and private research. Work to this end is undertaken by: ANVAR (Agence nationale de valorisation de la recherche), units set up for this purpose in the universities, the technical centres, contract research companies, and the NOVELECT network of EDF (the French national electricity company). To these should be added the technical assistance provided to Small and Median Enterprises (SMEs) by large industrial groups (CREATI) Ref.#F-R-5.</p>
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-R-2	
COUNTRY:	France
INITIATIVE:	Support of Technological Development of SMEs
CATEGORY:	R&D
GOAL:	Strengthening competitiveness
AGENCY:	DATAR
DESCRIPTION:	Assistance for counselling, information and training, generally financed by the state or the Regions, e.g., the FRAC (Fonds regionaux d'aide au conseil). This policy has led to the establishment of the ARIST (Agences regionales d'information scientifique et technique), of the DRIR and the DRRT (networks of technical advisers in the regional directorates of the Ministries of Industry and Research), of the CRITT (#F-R-8) (Centres regionaux d'innovation et de transfert de technologie) and of the FRATT (Fonds regionaux d'aide aux transferts de technologie).
FUNDING:	T.B.D.
USE:	10,000 companies benefited from counselling in 1983 - 1988 period. The present plan aims at doubling the target.
LAST UPDATE:	February 1991

REF. # F-R-3	
COUNTRY:	France
INITIATIVE:	CREATI
CATEGORY:	R&D
GOAL:	Increase competitiveness of small companies
AGENCY:	CREATI
DESCRIPTION:	<p>CREATI links small and medium enterprises (including software companies), with R&D establishments of large companies.</p> <p>CREATI operates in harmony with various regional public networks, such as ARIST, CRITT (#F-R-8), DRIR, DRRT. CREATI operates also in harmony with private Chamber of Commerce network.</p> <p>ANVAR is responsible for covering the costs of the R&D services to SME.</p>
FUNDING:	ANVAR covers the costs of SME bills
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-R-4	
COUNTRY:	France
INITIATIVE:	University - Industry Cooperation
CATEGORY:	R&D
GOAL:	Help with tech transfer into smaller French companies
AGENCY:	T.B.D.
DESCRIPTION:	<p>Cooperation between public research bodies and industry is being encouraged through a wide variety of mechanisms, such as:</p> <ul style="list-style-type: none"> o mixed laboratories o commercialization mechanisms o exchanges of research personnel o financial support to SME, paid by ANVAR
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-R-5	
COUNTRY:	France
INITIATIVE:	Consortia
CATEGORY:	R&D
GOAL:	Pre-competitive research
AGENCY:	MRT
DESCRIPTION:	Groupements d'interet public (GIP) are pre-competitive research consortia, involving companies, government research agencies and sometimes universities to collaborate on well-defined programs. Consortia are established by inter-ministerial decrees.
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-R-6	
COUNTRY:	France
INITIATIVE:	CRITT
CATEGORY:	R&D
GOAL:	Tech transfer from govt. laboratories to industry
AGENCY:	CRITT
DESCRIPTION:	<p>Centres regionaux d'innovation et de transfert de technologie (CRITT) is a programme aimed at providing technical assistance and promoting innovation and technology diffusion and transfer to small and medium sized enterprises. The purpose behind its creation stems from the political decentralization of government services. CRITT attempts to make linkages between all enterprises, industries and research facilities of all sizes and in all directions.</p> <p>CRITT operates out of Chambers of Commerce, industrial associations and local industries. A council of representatives from industry, research laboratories and universities work to facilitate the linkages between those who need technology and those who can supply the innovation.</p>
FUNDING:	T.B.D.
USE:	Popular especially with SME companies
LAST UPDATE:	February 1991

REF. # F-R-7	
COUNTRY:	France
INITIATIVE:	International Cooperation
CATEGORY:	R&D
GOAL:	Improve access of French firms to international R&D effort
AGENCY:	Ministry of Research and Technology (MRT)
DESCRIPTION:	<p>The French government devotes substantial amounts of the MRT funds to improving access of French firms to the pool of international knowledge via international cooperation programs.</p> <p>To illustrate, FF700 million a year (C\$160 million) is provided for EUREKA (#EU-0-1), where French firms are involved in 127 out of 297 projects. France is also fully participating in EC programs such as ESPRIT (#EU-0-2) or RACE.</p> <p>While the national technological programs have been stabilizing, the government has been increasing support for international cooperative programs in R&D, including software.</p>
FUNDING:	See above
USE:	See above
LAST UPDATE:	February 1991

REF. # F-M-1	
COUNTRY:	France
INITIATIVE:	Government Procurement
CATEGORY:	Marketing
GOAL:	Strengthen Software Industry
AGENCY:	Interministerial Committee for Government Procurement Policy
DESCRIPTION:	<p>Government procurement accounts for a substantial share of the data processing market, both for hardware and software. Government spending on computer equipment amounted to FF 11 million (C\$2.5 billion) in 1982 (excluding local authorities, the Prefecture of Police and defence). The Mission a l'Informatique attached to the Ministry for Industry was, until 1984, responsible for promoting computer applications within government and its related economy, via the Computer Commissions established within each department. Sweeping reforms to this system were however announced in 1984, to be accompanied by a wide-ranging plan to computerise government agencies. Under the 1984 arrangements, an Interministerial Committee for Government Procurement Policy, reporting to the Prime Minister, had a mandate to ensure that government remains in control of its own computer applications. The reform followed a combination of studies and consultations in France, which have concluded that government procurement has been used too much as industrial policy instrument, sometimes at the expense of the real needs and interests of the departments. The plan for government computerisation accompanying the reform anticipated among others, the development and adoption of a family of word-processing work stations, compatible and to be usable and maintainable with a standard form of training across the board in government. The target one million work stations and six million public sector employees trained to use them by 1990.</p> <p>About 12 percent of software requirements have been farmed out.</p>
FUNDING:	See above
USE:	Government procurement has been considered as the strongest factor in creating demand for software, according to SYMANTEC.
LAST UPDATE:	February 1991

REF. # F-M-2	
COUNTRY:	France
INITIATIVE:	Logic
CATEGORY:	Marketing
GOAL:	Catch up with main European competitors in modernizing industrial base
AGENCY:	ADEPA
DESCRIPTION:	<p>Logic is a program for improved diffusion and use of computer-controlled and automated production equipment, with appropriate software. The program intends to close the gap between the French companies and their main competitors in the ECC.</p> <p>Logic is focused on small and medium enterprises. It provides SP companies with a new market.</p>
FUNDING:	T.B.D.
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # F-M-3	
COUNTRY:	France
INITIATIVE:	COFACE
CATEGORY:	Marketing
GOAL:	Export Promotion
AGENCY:	Ministere de l'economie, des finances et du budget
DESCRIPTION:	Compagnie Francaise d'assurance pour le commerce exterieur (COFACE) in collaboration with ANVAR, offers financial assistance of up to 75 percent of the cost of market research to companies trying to assess the market for their innovations. It can be applied to such marketing expenditures as exhibitions, the use of consultants, transportation and the production of samples.
FUNDING:	T.B.D.
USE:	Frequent
LAST UPDATE:	February 1991

REF. # F-M-4	
COUNTRY:	France
INITIATIVE:	NOREX
CATEGORY:	Marketing
GOAL:	Increase competitiveness of SMEs
AGENCY:	NOREX
DESCRIPTION:	<p>NOREX, the French standards organization (similar to CSA), helps small and medium enterprises in obtaining knowledge of foreign standardization and certifications systems so that they can adapt their products to the requirements of the target markets.</p> <p>France has also implemented a related program of export promotion that offers counselling and training to potential exporters.</p>
FUNDING:	Unknown
USE:	Unknown
LAST UPDATE:	February 1991

REF. # F-M-5	
COUNTRY:	France
INITIATIVE:	ACTIM
CATEGORY:	Marketing
GOAL:	Promote exports
AGENCY:	ACTIM
DESCRIPTION:	<p>Agence pour la cooperation technique industrielle et economique (ACTIM), promotes French technologies abroad via 20 press offices throught the world.</p> <p>ACTIM also organizes sessions in France for high level foreign experts and missions abroad to promote French technology.</p>
FUNDING:	T.B.D.
USE:	Frequent
LAST UPDATE:	February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

ITALY

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

ITALY

Italy has surpassed the U.K. to become the fifth largest Western economy. With 58 million people, living on slightly over 300 thousand sq.km., the GNP of the country has reached in 1991 over US\$1.25 trillion (1400 trillion lire), that is US\$22,000 per capita, ahead of Canada.

Italy has traditionally pursued the so called reverse strategy of technological development, similar to that of Japan, relying more on commercializing of technology imports rather than on own indigenous R&D, which remains relatively low at 1.5 percent of GNP.

The triple nature of industrial structure - the huge public companies lead by IRI (550 thousand employees), five very large private groups lead by Fiat and a very vibrant million of small and medium enterprises - has been generating impressive medium-technology exports.

The Italian computer industry is dominated by the financially troubled Ing C. Olivetti & c.spa, the Italian informatics multinational group, with 1990 revenue of over 9 trillion lire (over C\$9 billion) and recently reduced work force of \$47,000. In 1988, Olivetti was the tenth largest software company in Europe and the fifteenth largest in North America.

The Italian information technology market in 1990 reached over 19 trillion lire (over US\$17 billion) of which some 40 percent, that is over US\$7 billion, was accounted by software and information services. The software products represent 38 percent of this volume. Thus, the software product market was last year close to C\$3 billion, twice the size of the Canada's. As elsewhere in Europe, at least half of this market is served by U.S. imports.

The Italian software and software services industry is lead by Finsiel, with 1988 revenues US\$554 million, making her Europe's second largest independent software company. The top ten companies account for 29 percent of market share. The Italian software capability stems from some 1,150 firms, of which about 10 percent are exclusively focused on software. In 1989, over 54,200 persons were employed in software and software services, more than in hardware. Generally, the software industry is judged to be in need to catch up with those of France or Germany. Traditionally located in the industrial north, the industry is now spreading south, drawn especially by banking and tourist applications.

Italy has yet to formulate her National Plan for Informatization.

At present, there is no national government initiative aimed specifically at software products industry. All relevant initiatives mentioned below are broader in scope.

While there is no national agency engaged in attracting foreign investment, several regions have been actively seeking high tech companies: Mezzogiorno, (#I-I-1), Friuli-Venezia Giulia (#I-I-2) and Valle d'Aosta. The efforts to create Italian Silicon Valley so far focused on the triangle Torino-Novarra-Ivrea and potentially on Bari.

As far as government financing help to software industry is concerned, there is a clear preference for loans over outright grants. The private risk capital funds are encouraged by the government to get involved in software (#I-F-1).

There are no tax concessions for software companies, other than the generous concessions available to settle in the preferred regions, such as Mezzogiorno.

In the category of development of human resources, the initiatives for educating computer professionals are lead by Milano Polytechnic, Torino Polytechnic and University of Pisa. A ministerial decree to promote collaboration between universities and other public and private research institutions was issued in 1988.

The Chamber of Commerce organizes training for entrepreneurs, for which software entrepreneurs are eligible. Training may be also financed by the government from the Special Fund for Applied Research.

An Act of 1988 increased the resources allocated to scientific research. The CNR (National Research Council) with 6,200 personnel, is a pivotal institution of the system of 270 institutes. Among the leading research institutes, where software R&D is carried out, are the Institute Galileo Ferraris in Torino, the Istituto Nazionale Francisco Severri in Rome and the IRST in Trento.

Page 3

ITALY

By financing about 20 percent of industrial R&D, the Italian government stimulates its activity. The government has employed two main instruments of science and technological policy: Special Fund for Applied Research and Special Working Capital Fund for Innovation (#I-R-1). The companies are encouraged to participate in European programs such as EUREKA or ESPRIT, where they lead about one-sixth of all the projects. The procurement of computerization of public service has also helped to software development (#I-R-2). Last but not least, the 1987 Act to promote transfer of advanced technologies into SME has helped the software industry as well (#I-R-3).

The government has promoted partnerships between the large companies and the small and medium enterprises (I-M-1).

An interesting initiative to help in marketing to SMES, detailed in (#I-M-2), indicates why Italians are one of the leading exporters of the world.

Last Update: February 1991

REF. # I-I-1	
COUNTRY:	Italy
INITIATIVE:	Mezzogiorno
CATEGORY:	Infrastructure
GOAL:	Regional Development
AGENCY:	Institute for Assistance in the Development of Mezzogiorno (IASM)
DESCRIPTION:	<p>The regional assistance scheme of the Italian government to help the development of Mezzogiorno - Southern Italy. The Mezzogiorno covers at present an area of 123 thousand sq. km. (size of Czechoslovakia, about 40 percent of Italy), with a population of 21 million.</p> <p>To attract the investment to this part of Italy, the government, through the Ministro per gli Interventi Straordinari nel Mezzogiorno and through the IASM agency, offers under "Legge 64" important incentives to Italian and foreign companies prepared to settle there.</p> <p>Financial incentives available are grants graduated with the size of the investment from 40 percent (to C\$7.5 million) to 30 percent (to C\$32 million). Investments over this treshold are eligible for 15 percent grants. The grants may be increased by one fifth for priority sectors such as software. Furthermore, the soft loans of up to 40 percent are available.</p> <p>The ten-year tax holiday is offered on company tax (IRPEG) and on local income tax (ILOR), the rates of which are 36 and 10.4 percent respectively.</p> <p>Special grants of 50 percent, and further soft loans are available for companies setting up R&D centres. The grants are increased by one fifth for priority sectors, such as software.</p>

Page 2
REF. # I-I-1

FUNDING:	The Italian government has poured C\$100 billion into the region over 40 years. Furthermore, over 95 percent of European Regional Development Fund allocation to Italy (about 1/3 of the total), goes into the Program every year.
USE:	Very popular with Italian and increasingly foreign investors, especially in some parts of Lazio. As a result, the most successful areas, such as Lazio or Abruzzo have been delimited from Mezzogiorno.
LAST UPDATE:	February 1991

REF. # I-I-2	
COUNTRY:	Italy
INITIATIVE:	Made in Friuli
CATEGORY:	Infrastructure
GOAL:	Attract investment
AGENCY:	Presidente, Regione Friuli - Venezia Giulia
DESCRIPTION:	<p>The autonomous region of Friuli-Venezia Giulia, in the far northeast of Italian peninsula, with some 1.2 million population, has been positioning itself as a "regione Ponte", a platform for trade with Central and eastern Europe.</p> <p>The region's technological development has focused on building an internationally oriented scientific and technological infrastructure, enhancing its claim to be one of the technological leaders in Italy.</p> <p>The regional government, a minority owner of some 150 operating businesses, actively attract investors. Friuli offers interesting investment incentives.</p> <p>The most prominent ones are the low-cost capital loans (at 6 percent) or the subsidies of up to 30 percent on wages and salaries of personnel.</p> <p>Friuli S.P.A. provided risk capital from C\$80,000 to C\$18 million dollars even for companies in stages 1 and 2.</p>
FUNDING:	T.B.D.
USE:	Increasingly popular
LAST UPDATE:	February 1991

REF. # I-F-1																																																										
COUNTRY:	Italy																																																									
INITIATIVE:	Venture Capital																																																									
CATEGORY:	Financing																																																									
GOAL:	Provide risk capital to companies																																																									
AGENCY:	Finanze																																																									
DESCRIPTIONS:	<p>The venture capital in Italy has not taken off as elsewhere in the EC. The government looks sympathetically at venture capitalists who finance the high-tech industry. Friulia S.P.A. is backed by the regional government. Several of the leading private capital pools listed below are prepared time to time to offer capital help to software products companies.</p> <table> <tr> <th rowspan="2">Fund Managers</th><th colspan="2">Range of Individual Capital Participants (all figs. in ECU '000)</th><th colspan="3">Company Development Stage</th></tr> <tr> <th>Min.</th><th>Max.</th><th>Start Ups</th><th>Develop- ment</th><th>Manbuy Out/In</th></tr> <tr> <td>Credipar</td><td>370</td><td>2,600</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Friulia S.P.A.</td><td>50</td><td>11,000</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Iniziativa</td><td>200</td><td>530</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Invest</td><td>300</td><td>20,000</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Palladio Finanziaria</td><td>na</td><td>33,000</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Societa Finanziaria di Partecipazione</td><td>600</td><td>6,700</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>SPI Prom. e Sviluppo Imprenditoriale</td><td>na</td><td>3,000</td><td>Y</td><td>Y</td><td>N</td></tr> </table>					Fund Managers	Range of Individual Capital Participants (all figs. in ECU '000)		Company Development Stage			Min.	Max.	Start Ups	Develop- ment	Manbuy Out/In	Credipar	370	2,600	N	Y	Y	Friulia S.P.A.	50	11,000	Y	Y	Y	Iniziativa	200	530	N	Y	Y	Invest	300	20,000	N	Y	Y	Palladio Finanziaria	na	33,000	N	Y	Y	Societa Finanziaria di Partecipazione	600	6,700	Y	Y	Y	SPI Prom. e Sviluppo Imprenditoriale	na	3,000	Y	Y	N
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Palladio Finanziaria	na	33,000	N	Y	Y																																																					
Societa Finanziaria di Partecipazione	600	6,700	Y	Y	Y																																																					
SPI Prom. e Sviluppo Imprenditoriale	na	3,000	Y	Y	N																																																					
FUNDING:	See above, 1 ECU is approximately C\$1.60																																																									
USE:	Varies widely																																																									
LAST UPDATE:	February 1991																																																									

REF. # I-R-1	
COUNTRY:	Italy
INITIATIVE:	Special Funds
CATEGORY:	R&D
GOAL:	Support R&D in industry
AGENCY:	
DESCRIPTION:	<p>About one fifth of industrial R&D was financed by the government. This figure does not include indirect support via soft loans and tax relief. It includes both grants for company R&D and contracts to perform R&D for government use.</p> <p>The government ha employed the two main policy instruments since 1982:</p> <ul style="list-style-type: none"> o Special Fund for Applied Research <ul style="list-style-type: none"> - for projects up to the industrial application stage - funds also training programs o Special Working Capital Fund for Innovation <ul style="list-style-type: none"> - for the stages thereafter
FUNDING:	T.B.D.
USE:	Most often used instruments
LAST UPDATE:	February 1991

REF. # I-R-2	
COUNTRY:	Italy
INITIATIVE:	Automation of Public Administration
CATEGORY:	R&D
GOAL:	Promoting computerization of the government operations
AGENCY:	Government Stationary Office
DESCRIPTION:	<p>A special committee of the Government Stationary Office (PGS) of the Treasury (Tesoro) has coordinated and supported automation projects in the public administration. The benefits of this initiative is two-fold. Not only has the public service delivery been modernized, the procurement has also stimulated help the growth of the software companies.</p> <p>The appropriate legislation has been adopted to define standards for promoting and encouraging computerization of individual government agencies.</p> <p>There are two committees, reporting directly the Prime Minister, responsible for computer investments in the public sector, one for government proper, the other for non-governmental public agencies. The latter represent the computing capacity nearly equal to the governmental one.</p>
FUNDING:	Estimated to be in excess of C\$1 billion a year, for both investment and current expenditure, for each part of the public sector.
USE:	Extensive
LAST UPDATE:	February 1991

REF. # I-R-3	
COUNTRY:	Italy
INITIATIVE:	Act 1989
CATEGORY:	R&D
GOAL:	Promote tech transfer to SMEs
AGENCY:	
DESCRIPTION:	<p>In 1987, an Act was adopted to extend the provisions of the 1983 Act in order to promote transfer of advanced technologies to small and medium enterprisesand. It provides for financial aid for purchasing or leasing computer equipment or systems, including software.</p> <p>Part of the funds reserved for small and medium enterprises is ear-marked for technological innovation.</p>
FUNDING:	T.B.D.
USE:	Often used
LAST UPDATE:	February 1991

REF. # I-M-1	
COUNTRY:	Italy
INITIATIVE:	Large and Small Partnerships
CATEGORY:	Marketing
GOAL:	Strengthen the SMES
AGENCY:	Bilancio e Programmazione Economica
DESCRIPTION:	<p>The government has promoted partnerships as one of the promising approaches to SME development. The large company provides the guarantee and skills of a large group, especially in the marketing and sales capability to the small to medium software company. These are usually the weakest parts of the company's capability.</p> <p>On the other hand, the large company obtains very flexibly mostly the new product line or software service, but also the quality of a service of specialists.</p> <p>Italy has a long tradition of "terzisti", that is of small, extremely innovative companies, living in symbiosis with larger companies. The initiative was inspired by this tradition.</p> <p>A large number of such partnerships have been created by Olivetti Information Services (OIS). O.I.S. operates through several main companies who direct more than 40 operating firms. O.I.S. caters to large markets (finance, central and local government, industry, defence) with dedicated, vertical structures, in a position of offering all the required specific activities, from consultancy to the development of software, to application products:</p> <ul style="list-style-type: none"> o Syntax Sistemi Software, together with Nomos Sistema and Unit, operates in professional services and in software products in the banking, finance and insurance sectors. o Syntax Stato, with Systema, PBS, G70, Logos Progetti, Eustema, Sistemi 90, Sikania, in professional services and in software products for Central and Local government.

DESCRIPTION:	<ul style="list-style-type: none">o O. Group, together with the associated companies Key, O. Kati, Delos, Advanced Software Technology, Fuigi, O. Mig, and with SY.F.A., in professional services and in software products for manufacturing industry and industrial automation.o Tecnost, with Larimart and Modis, in defence (information systems and field telecoms). <p>In the specialist areas the active firms are of horizontal type, i.e. endowed with technical skills and marketing expertises capable of covering all fields of demand arising from different market sectors:</p> <ul style="list-style-type: none">o Elea, with the subsidiaries Elea Quality Consult, Elemedia, Systech, Trends & Strategy, operates in the sector of education, training and organization consultancy.o Seva, with Olinet, Radiocor Telerate, Setesi, Simo TLC, in value-added network services.o Syntax Processing in data processing services and facilities management.o O. Packages in system software (packages).o Tecnost, with the subsidiaries Tecnosafe Tecnotour, Dating, Tiesse, OSE, Eltec, in system integration.o Tecnost again, with the subsidiaries MAEL and OSAI-AB in turn-key system and special products.
FUNDING:	Not applicable
USE:	Frequent
LAST UPDATE:	February 1991

REF. # I-M-2	
COUNTRY:	Italy
INITIATIVE:	Export Consortia
CATEGORY:	Marketing
GOAL:	Increase Italian exports
AGENCY:	Instituto Nazionale per il Comercio Estero (ICE)
DESCRIPTION:	<p>The Italian government has encouraged creation of export consortia, to overcome structural difficulties of small and medium enterprises in open markets abroad.</p> <p>The building of consortia is enabled by two information systems. The API has a system PRATO that electronically links some 30,000 enterprises, providing instant information on profiles of potential partners and their stated objectives. ICE maintains a system SICE that provides market and industry information in 78 countries, to 22,000 Italian (and about 20,000 non-Italian) companies.</p> <p>These linkages allow the Italian exporters to organize themselves swiftly for any new export drive, such as the one reacting to the opening of Central and Eastern Europe.</p>
FUNDING:	T.B.D.
USE:	By 1989, at least 150 export consortia were created.
LAST UPDATE:	February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

UNITED KINGDOM

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

UNITED KINGDOM

The United Kingdom, where a 1991 population of close to 58 million lives on a territory of 244 thousand sq.km., had last year a GNP of GBP 625 billion, (US\$1.2, C\$1.35 trillion), that is US\$20,500 per capita. The United Kingdom is the sixth largest Western economy.

Under the Conservative government, the industrial strategy has placed emphasis on privatization, deregulation and reliance on market forces. The resulting industrial renewal is still fragile and spotty. In any case, the strong support of high technology industries has been continued. The technology development strategy has been traditionally R&D supply driven. The United Kingdom performs about 2.3 percent of R&D, that is about over GBP 14 (close to C\$32) billion. At least a quarter has been accounted by defence. About a half of research is financed by industry. The weak point of strategy has been commercialization of the innovations.

Due to the large installed base of personal computers, the U.K. had in 1988 the second highest computer power per capita in the world, after the United States.

The computer industry in the U.K. has had the longest involvement with information technology, starting with research on EDSAC and ACE, and the early entry into computer manufacturing by Ferranti, Elliott and others. The computer industry in the U.K. maintains the fourth place in Europe after FRG, France and Italy. The computer exports account for about eight to nine percent of global market share.

The flagship of the U.K. computer industry was ICL, Europe's most profitable computer manufacturer with 1989 sales of GBP 1.6 (C\$3.5) billion and profits of GBP 145 (C\$320) million. Last summer, in a major blow to the national technical pride, the former national champion computer company was sold by its telecommunications parent STC to the Japanese Fujitsu, which has acquired 80 percent of the firm for (then) C\$1.6 billion.

In 1987, the U.K. software market reached ECU 4.4 (C\$7) billion. Of this volume, the 43.5 percent, that is ECU 1.9 (C\$4.2) was accounted for by software products. The substantial market share, according to some estimates, as high as two thirds, is held by the U.S. imports.

The British liked to think that they lead the world in computer programming. The British pride in their software has a genuine basis. There is a long history of first rate original compilers and operating systems, usually developed in university environment. Unfortunately, they were rarely translated into successful commercial products. Recently, there has been a loss of morale in the industry, in the wake of a number of takeovers, such as of Hoskins by Cap Gemini Sogeti.

UNITED KINGDOM

After a number of mergers and acquisitions, the degree of concentration of the industry is comparable to that of France. The top five vendors accounted for 18 percent, the top ten for 28 percent of the 1988 market. In that year, the largest companies were Sema Group, with US\$375 (C\$430) million sales, SD-Scicon, with US\$366 (C\$420) million and Logica, with US\$270 (C\$310) million turnover. Only the financially troubled Logica has a presence in software products. The three companies have staff of the order of three to four thousand employees and all of them operate internationally, on both sides of the Atlantic.

The significant exports of the software are hampered by a continuous brain drain of manpower, mostly to the U.S., but also to Canada.

To understand the present government initiatives in information technology in an appropriate perspective, it is necessary to go back about a decade. In early 1980s, faced with the challenge of the Japanese Fifth Generation Computer challenge, the government formulated the strategic Alvey program for a period of 1983-1988, with a budget then equivalent to C\$350 million. The key part of Alvey was software - related. The software engineering project IPSE (Integrate Project Support Environment), with a budget of GBP 65 million (then C\$100 million) over five years, aimed at developing a very high level, language-independent, software development environment.

The sequel of Alvey, the present 1988 super program of the Department of Trade and Industry, called LINK, has 24 programs under way, with a total budget of over C\$460 million over five years. It is profiled in #UK-O-1.

The DTI has formulated and implemented one of the most elaborate programs of support for the software product industry, the Software Products Scheme (SPS), with a budget of over C\$75 million a year, described in some detail in #UK-O-2.

To support software activities, the U.K. has established in 1965 the National Computer Centre (NCC), which administers the PS. It is profiled in #UK-I-1.

The U.K. has three dozens of science parks. The largest, at Cambridge, looks like the U.K.'s answer to Silicon Valley. It is reviewed in #UK-I-2.

UNITED KINGDOM

The government's support of the software industry has been in place for years. Many instruments used are the general instruments, available to company in any field, across the board. In financing, for instance, the viable small companies are eligible for the Loans Guarantee Scheme (#UK-F-1). The companies that locate in the so called "assisted areas" are entitled to financial assistance of up to 30 percent of the project costs; in Northern Ireland the percentage might climb up to 75 percent. The help is not automatic, it is available on a discretionary basis. For more, see #UK-F-2.

The United Kingdom is regarded as having the second largest venture capital industry, after the United States. There are as many as 150 private funds, the two scores of them are listed in #UK-F-3. This entry also discusses the role of the public institution ICFC, tax concessions under the Venture Capital and Business Expansion Schemes, as well as the junior stock markets: USM, Third Market and OTC.

The U.K. corporate tax rates are now the lowest in the EEC - 35 percent the basic rate, 25 percent for SMEs (#UK-T-1).

The U.K. has a number of job training programs, aimed at providing jobs for the unemployed through new local organizations TECs (Training and Enterprise Councils). Their relevance to software industry will have to be determined at a latter date. The #UK-H-1 outlines a successful program for counselling the managers of SMEs, called Enterprise Initiative.

In the research segment, the prevailing support instruments are grants (#UK-R-1). The SMART program for support of innovative technological ideas is described in #UK-R-2. The DTI thrust to support collaborative research is touched upon in #UK-R-3. The newest initiative SPUR that does not require collaboration is set forth in #UK-R-4. The technology transfers from the academia into the industry is exemplified by the Imperial Software Technology, mentioned under #UK-R-5. The government, via DTI encourages and supports the pan-European research projects, such as ESPRIT (#EU-O-1) and EUREKA (#EU-O-2). The levels of participation are falling behind FRG and France, though.

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UNITED KINGDOM

In the marketing area, the government procurement is discussed in #UK-M-1. The recently set up network of Regional Technology Centres promote diffusion of information technology into SMEs, benefitting the software companies (#UK-M-2). The British Information Technology Export Organization and Export IT scheme are featured in #UK-M-3.

Last Update: February 1991

REF. # UK-O-1	
COUNTRY:	United Kingdom
INITIATIVE:	LINK
CATEGORY:	R&D
GOAL:	Bridging the gap between science and the market
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	<p>LINK is a 1988 initiative for the support of strategic, pre-competitive industrially relevant research, involving companies and science-based institutions in collaborative research projects. It will involve all of the major R&D Departments of Government and Research Councils through support for programmes in their own spheres of interest.</p> <p>LINK aims to accelerate the commercial exploitation of government-funded research. The initiative focusses on advances in science and engineering with particular commercial promise. It will stimulate collaboration between industrial and science-based partners on projects in key areas of science and technology. This is to speed the future exploitation of new processes, and the development and profitable marketing of new products and services by industry.</p> <p>The objectives of LINK are to:</p> <ul style="list-style-type: none"> - foster priority areas of research; - stimulate an increase in industry's investment in R&D; - help industry exploit scientific developments; - make scientists and engineers more aware of industry's needs; - develop technologies which cross industrial sectors/scientific disciplines. <p>The benefits of LINK are:</p> <ul style="list-style-type: none"> - researchers will see their work successfully developed and will become better informed of industry's needs; - industrialists will benefit from the wealth of expertise in establishments of higher education and research, thus improving their competitive position both at home and in the world's markets;

DESCRIPTION:	<ul style="list-style-type: none">- the economy will benefit because industry will be better able to grasp new opportunities at the cutting edge of international competition. <p>LINK provides a framework for collaborative, pre-competitive research involving the science base and industry. It aims to help industry exploit developments in science, by fostering priority areas of scientific research directed towards the development of innovative products, processes and services. It also aims to stimulate industrial investment in R&D (the government is providing GBP 210 million over the first five years, to be matched by at least as much from industry).</p> <p>LINK resources are being concentrated on a series of programmes in areas of science and technology with particular promise in terms of the objectives of LINK. Each programme consists of a portfolio of collaborative projects.</p> <p>To date there are 18 programmes in operation, in areas ranging from advanced electronics to biosciences and food, and from communication to engineering and materials.</p> <p>The LINK initiative reflects the trend towards government support for collaborative, pre-competitive research, and away from support for single firm near-market product development. Universities and other higher education institutes are major players in LINK as the science base partners in projects. LINK is a key element in the government's strategy for the support of long-germ research which has potential for exploitation by industry, but which needs further development before commercial applications.</p>
FUNDING:	GBP 210 (C\$462) million government funds over five years (1988-1993). However, of this, only GBP 26 million is new funding.
USE:	24 programs in operation, 500 companies participating.
LAST UPDATE:	February 1991

REF. # UK-O-2	
COUNTRY:	United Kingdom
INITIATIVE:	Software Products Scheme (SPS)
CATEGORY:	Overall
GOAL:	Support program for software industry
AGENCY:	DTI/NCC
DESCRIPTION:	<p>The Software Products Scheme (SPS) is one of the most elaborate programmes implemented of support for software products industry. This subsidises the development of innovative software packages by grants of up to 25 percent of development costs. The National Computing Centre (NCC) manages the Scheme on behalf of the Department of Trade and Industry (which retains final approval). Projects must be innovative and applicants must demonstrate technical and commercial competence, as well as the need for assistance. The SPS had been running at a fairly low level of activity (average commitments were less than GBP 1 (C\$2.2) million each year) until it was restructured and re-launched in 1983. Grants of GBP 29 (C\$65) to GBP 39 (C\$86) million a year (over two years) have been made, the grants are leveraged 1:3. The direction and operation of the SPS is monitored by an advisory committee including representatives of the industry through the Computer Services Association, the NCC and the Department of Trade and Industry. There are no limits on size of project or grant. The largest grant awarded to date was just over GBP 1 million (C\$2.2 million).</p> <p>Importantly, millions of venture capital were made available for software development under this scheme.</p>
FUNDING:	Above GBP 35 (C\$77) a year
USE:	About 100 projects a year
LAST UPDATE:	February 1991

REF. # UK-I-1

COUNTRY:

United Kingdom

INITIATIVE:

National Computing Centre (NCC)

CATEGORY:

Infrastructure

GOAL:

Strengthen software industry

AGENCY:

NCC

DESCRIPTION:

The emergence of a software industry was supposed to be helped by the establishment of the National Computer Centre (NCC) in 1965, with its emphasis on portable software, programming standards, job classifications, user's forum, etc. NCC's annual budget is at least \$18 million, with a staff of 350. Especially important was the Software Product Scheme, that NCC administered for the government (#UK-O-2).

FUNDING:

See above

USE:

See above

LAST UPDATE:

February 1991

REF. # UK-I-2

COUNTRY:	United Kingdom
INITIATIVE:	Cambridge "phenomenon"
CATEGORY:	Infrastructure
GOAL:	Create a U.K. Silicon Valley
AGENCY:	Cambridgeshire Council
DESCRIPTION:	<p>By 1990, there were 38 science parks in the U.K., employing some 12,500 people. The largest English Silicon Island has sprung up around the ancient Cambridge University; it is the largest European concentration of technology-based companies. Of some 500 hi-tech companies, full 100 sprouted in the past seven years. Some 50 companies found a home in the town's Science Park, which is the largest park in the U.K.. However, the companies have been rather small and poorly connected to the large companies. Cambridge thus might have resulted in only a "nursery-of-ideas" type of complex. Most recently, fortunately, the large foreign multinational companies such as Philips, Ciba Geigy or Schlumberger arrived to broaden the economic base and provide so needed linkages for the local high-tech companies, which have been starved for funds. Whether the Cambridge complex will take off in a big way, remains to be seen. In any case, the Cambridgeshire is the fastest growing country in the U.K.</p>
FUNDING:	T.B.D., estimated to be well over US\$100 million
USE:	500 companies
LAST UPDATE:	February 1991

REF. # UK-F-1	
COUNTRY:	United Kingdom
INITIATIVE:	Loans Guarantee Scheme
CATEGORY:	Financing
GOAL:	Strengthen viability of SMEs
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	<p>The Loans Guarantee Scheme, introduced in 1981 to facilitate the supply of finance to viable small firms, where conventional loans are not available, was due to end in 1989, but has now been extended. The government guarantees 85 percent of each loan by participating lenders, and in return a premium of 2.5 percent per year on the outstanding amount guaranteed is paid by the borrower. In addition, as from January 1988, simplified application procedures have been introduced for loans under GBP 15 (C\$33) thousand. The maximum loans amount authorised under this scheme was increased from GBP 75,000 to GBP 100,000 (C\$220,000) as from 1989. Other programmes have been set up to meet the ME's need for equity and start-up capital: e.g., the Business Expansion Scheme, the Venture Capital Scheme, the Enterprise Allowance Scheme (#UK-F-3).</p>
FUNDING:	T.B.D.
USE:	Popular, over a decade in place
LAST UPDATE:	February 1991

REF. # UK-F-2	
COUNTRY:	United Kingdom
INITIATIVE:	Assisted Areas
CATEGORY:	Financing
GOAL:	Attract investment into the assisted areas
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	<p>There are literally hundreds of location grants and incentives throughout the U.K. The most comprehensive data base of all the U.K. grants is available in the EPRC, based in the University of Strathclyde in Glasgow. The companies - irrespective whether foreign or U.K. owned - which are planning to locate in one of the U.K.'s assisted areas stand the best chance of receiving UK government (and EC) financial assistance of up to 30 percent of total project costs. The U.K. has two types of assisted areas - development areas and intermediate areas. The grants offered to the companies locating in the development areas tend to be larger. Northern Ireland offers the highest level of government support of up to 75 percent. This attracted for instance British Telecom.</p> <p>All grants are discretionary. They are granted only on basis of discussions with DTI, which in fact carefully screens the applicant for technical and financial viability, for job creating potential, an export potential, or a contribution to strengthening the U.K.'s industrial base.</p>
FUNDING:	T.B.D.
USE:	The scheme has been a success in Scotland and Wales.
LAST UPDATE:	February 1991

REF. # UK-F-3

COUNTRY:

United Kingdom

INITIATIVE:

Access to Venture Capital

CATEGORY:

Financing

GOAL:

Provide SP companies with capital

AGENCY:

Multiple

DESCRIPTION:

The United Kingdom, is regarded as the most fertile ground for venture capitalism outside the United States. Several measures seem to have provided considerable impetus. The measures may be divided into three groups:

- 1) Major institutions and public agencies acting as venture capitalists

The main supplier of loan and share capital to small businesses in the United Kingdom is the Industrial and Commercial Finance Corporation. However, only a part of ICFC's activity may be considered as venture capital investing. The ICFC was first set up in 1945 by the Bank of England and the major banks after earlier official reports had identified a gap in the provision of finance to smaller businesses. It now forms part of the Investors in Industry Group which the major banks own, with the Bank of England holding a minority interest. The Group raises its funds on the financial markets. The portfolio of the ICFC comprised GBP 530 million (C\$1.2) million invested in four thousand enterprises. The Scottish and Welsh Development Agencies also provide equity finance, normally in conjunction with private sector investors, for projects in their areas.

- 2) Support for new businesses

Various other recent measures, including tax concessions, foster the creation of new firms. The Government's Venture Capital Scheme, introduced in 1980 and Business Expansion Scheme, introduced in 1983, has offered tax concessions to individual investors in high tax brackets in qualifying companies. By 1985, funds approved under the scheme were estimated to have raised about GBP 44 (C\$100) million.

DESCRIPTION:**3) Creation of an Unlisted Securities Market**

This is the measure with the greatest impact, as an over-the-counter stock market is virtually a precondition for venture-capital activity. An Unlisted Securities Market (USM) was set up in London in 1980 and made a good start: by mid-1980s 250 firms were quoted, representing a stock market capitalization of several billion pounds. Of the hundred plus firms quoted about twenty were in the computer industry, and the proportion is expected to increase quickly. Apart from the USM, there is also since 1987, the Third Market. There has been substantial growth in the unregulated over-the-counter (OTC) market.

As a result of those favourable factors, private venture-capital companies have been formed in the United Kingdom and have already invested in a number of small software firms. U.K. funds represent the largest capitalization in this activity outside the United States. A recent survey identified as many as 150 venture-capital sources in the United Kingdom, 80 of which stated their willingness to back companies from their start-up stage. Unfortunately, no more than 15-20 have in fact invested into high technology in last couple of years and only half a dozen among them do understand the problematique of a software company.

Over a score of the larger VC funds are listed below:

<u>Fund Managers</u>	<u>Range of Individual Investments considered</u>		<u>Company Development Stage</u>	
	<u>Min.</u> <u>(GBP'000)</u>	<u>Max.</u> <u>(GBP'000)</u>	<u>Start</u> <u>Ups</u>	<u>Develop-</u> <u>ment</u>
3i Group	0	OPEN	Y	Y
Abingworth Management	250	2,000	Y	Y
Advent	300	3,000	Y	Y
Alta Berkeley Associates	250	1,500	Y	Y
Barclays Development Capital	200	OPEN	N	Y
Baring Brothers Hambrecht & Quist	0	1,500	Y	Y
Brown Shipley Development Capital	1,000	5,000	N	Y
Candover Investments	2,000	OPEN	N	Y
Charterhouse Development Capital	100	25,000	Y	Y
Electra Innvotec	300	2,000	Y	Y
Foreign & Colonial Ventures	500	5,000	N	Y
Granville & Co.	200	OPEN	Y	Y
Greater London Enterprise	5	500	Y	Y
Gresham Trust	250	1,500	N	Y
Grosvenor Venture Managers	200	2,000	N	Y

DESCRIPTION:Range of Individual
Investments consideredCompany Development Stage
Start Development
UpsFund ManagersMin.
(GBP'000)Max.
(GBP'000)Start
UpsDevelop-
mentGuinness Mahon Development
Capital

50

OPEN

Y

Y

Morgan Grenfell Development
Capital

1,000

20,000

N

Y

MTI Managers

250

750

Y

Y

Murray Johnstone

250

25,000

N

Y

Quayle Munro

250

1,500

N

Y

Schroder Ventures

500

25,000

Y

Y

Scottish Development Agency

5

1,000

Y

Y

Stewart, Ivory & Co.

500

2,000

Y

Y

Thompson Clive & Partners

0

3,000

Y

Y

Venture Founders

100

600

Y

Y

FUNDING:

T.B.D.

USE:Despite all these initiatives, there has been no spectacular
success of creation of any outstanding software company**LAST UPDATE:**

February 1991

REF. # UK-T-1	
COUNTRY:	United Kingdom
INITIATIVE:	Tax relief for SMEs
CATEGORY:	Taxation
GOAL:	Increase viability of SME
AGENCY:	?
DESCRIPTION:	<p>The tax measures of 1987-1988 brought lower rates for SMES, which now pay tax at a rate that is ten percentage points lower than the basic rate of corporation tax (25 percent compared with 35 percent).</p> <p>Capital gain tax for small firms has also been lowered, to 25 percent.</p> <p>The UK rates are now lowest in the EC12, among the lowest in OECD.</p>
FUNDING:	T.B.D.
USE:	Used extensively by foreign investors, such as those from Japan
LAST UPDATE:	February 1991

REF. # UK-H-1	
COUNTRY:	United Kingdom
INITIATIVE:	Enterprise Initiative
CATEGORY:	Human Resources
GOAL:	Improve management skills of SMEs
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	Enterprise Initiative was launched in 1988.
	The initiative was designed to improve management skills in small and medium enterprises by encouraging them to use outside consultancies. Small firm counselling service is provided by a network of Small Firms Info Centres (SFIC)s. The aim was to provide about a thousand of consultancies a month. The results were up to the expectations, even beyond.
FUNDING:	T.B.D.
USE:	Beyond expectations, 1,300 requests per month
LAST UPDATE:	February 1991

REF. # UK-R-1	
COUNTRY:	United Kingdom
INITIATIVE:	Financing Industrial R&D
CATEGORY:	R&D
GOAL:	Support Industrial R&D
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	<p>Throughout the 1980s, the government used a following mix of policy instruments to financially support the industrial R&D:</p> <ul style="list-style-type: none"> - grants: 65 percent - mixed grants and loans: 35 percent <p>Although there are some exceptions for SMEs, the industry no longer receives support for "near-market" research.</p>
FUNDING:	Over GBP 3 (C\$6.6) billion a year
USE:	Extensive, in 1987 34 percent of all industrial R&D was financed by government
LAST UPDATE:	February 1991

REF. # UK-R-2

COUNTRY: United Kingdom

INITIATIVE: SMART

CATEGORY: R&D

GOAL: Promotion of R&D in small and medium enterprises with commercial potential

AGENCY: Department of Trade and Industry (DTI)

DESCRIPTION: The SMART program is modelled on the U.S. SBIR program.

SMART (Small Firms Merit Award for Research and Technology) is a competition in two stages which provides support for innovative technological ideas. Funded by the Department of Trade and Industry (DTI), it is open to individuals and businesses with fewer than 50 employees. Through SMART, the DTI intends to demonstrate the commercial potential of innovative firms and show private sector institutions that their support as providers of finance is worthwhile.

The aims of the award are:

- To bring forward highly innovative projects which have commercial potential but are now dormant, because existing sources of finance do not wish to support them;
- To encourage the formation of small firms which will develop and market new ideas in selected areas of science and technology;
- To help these firms to mature sufficiently for private sources of funds to take a practical interest.

Following a pilot exercise in 1986, the first full competition was held in 1988 when 140 Stage 1 awards were made. In 1989 a three-year series of annual SMART competitions was launched with GBP 29 million funding. The number of Stage 1 awards has risen to 150 in 1989 and 180 in 1990. It is expected that about half of Stage 1 winners will move on to Stage 2 a year into their projects. Stage 1 is concerned with studying the feasibility of an innovative proposal and Stage 2 with further development e.g. of pre-production prototype.

DESCRIPTION:	<p>Stage 1 winners receive 75 percent of their project costs up to a maximum grant of GBP 37,500; Stage 2 winners receive 50 percent of project costs up to a maximum grant of GBP 50,000.</p> <p>The awards are made at the discretion of DTI and the selection process for Stage 1 takes account of:</p> <ul style="list-style-type: none">- The quality and novelty of the proposal;- The qualifications and experience, in both R&D and business, of the project leader and team;- The significance of the project and its potential commercial benefit to the UK;- The means proposed for turning the idea into a commercially successful product or process. <p>SMART should not be confused with a privately sponsored RITA award for a Software Product of the Year, awarded every year since 1983.</p>
FUNDING:	GBP 29 million over three years, GBP = C\$2.20
USE:	In 1990, 180 awards: very successful, demand well ahead of supply
LAST UPDATE:	February 1991

REF. # UK-R-3

COUNTRY:

United Kingdom

INITIATIVE:

General Industrial Collaborative Projects

CATEGORY:

R&D

GOAL:

Promote Collaborative R&D in the industry

AGENCY:

MTI

DESCRIPTION:

The General Industrial Collaborative Projects are bringing together companies, particularly SMEs, research organizations and government research establishments.

Government peers to promote partnerships between SMES, as well as between SMES and large enterprises, by providing information, by technical and by financial support.

FUNDING:

Total value of GBP 47 (C\$100) million this year

USE:

335 till 1990

LAST UPDATE:

February 1991

REF. # UK-R-4	
COUNTRY:	United Kingdom
INITIATIVE:	SPUR
CATEGORY:	R&D
GOAL:	Support R&D in SMEs
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	<p>Support for Products Under Research (SPUR) is a 1991 program, claimed to be tailored to SME needs. It is aimed at companies, employing up to 500 employees.</p> <p>SPUR does not require the recipient to collaborate with anybody. The condition of collaboration on research projects, previously relied upon in other programs (#UK-R-3), which the companies found as difficult to fulfil.</p>
FUNDING:	Seen as too small to make a difference, even by DTI (off the record)
USE:	Too early to evaluate
LAST UPDATE:	February 1991

REF. # UK-R-5

COUNTRY:

United Kingdom

INITIATIVE:

Imperial Software Technology (IST)

CATEGORY:

R&D

GOAL:

Tech Transfer: University to Industry

AGENCY:

Imperial College

DESCRIPTION:

To overcome traditional weakness in technology transfer, Imperial Software Technology (IST) was set up in early 1980s to bring academic software developments into U.K. industry.

FUNDING:

T.B.D.

USE:

T.B.D.

LAST UPDATE:

February 1991

REF. # UK-R-6

COUNTRY:

United Kingdom

INITIATIVE:

International Cooperative Programs

CATEGORY:

R&D

GOAL:

Internationalization of research

AGENCY:

Department of Trade and Industry (DTI)

DESCRIPTION:

Since the start of EUREKA (#EU-R-3) in 1985, DTI has committed GBP 30 million to EUREKA projects. Of some three hundred projects, a hundred currently involve UK partners (less than FRG or France).

FUNDING:

GBP 30 (C\$66) million

USE:

See above

LAST UPDATE:

February 1991

REF. # UK-M-1	
COUNTRY:	United Kingdom
INITIATIVE:	Government Procurement
CATEGORY:	Marketing
GOAL:	Increase sales potential of the software industry
AGENCY:	Central Computer and Telecommunications Agency
DESCRIPTION:	<p>The Central Computer and Telecommunications Agency is in charge of U.K. government procurement policy.</p> <p>The Agency aims to optimize departmental computer outlays, while supporting the competitiveness of the British computer industry and services.</p> <p>The government has adopted Government OSI Profiles (GOSIPs) as procurement guidelines for government agencies to use in marketing purchases from the vendors. GOSIP is a model for EEC EPHOS.</p> <p>Recent government policy thrust is to contract out a greater proportion of government software requirements and to delegate greater responsibility for procurement to user departments.</p>
FUNDING:	T.B.D.
USE:	Intensive
LAST UPDATE:	February 1991

REF. # UK-M-2	
COUNTRY:	United Kingdom
INITIATIVE:	Regional Technology Centers
CATEGORY:	R&D
GOAL:	Technology Diffusion
AGENCY:	Department of Trade and Industry (DTI)
DESCRIPTION:	<p>Regional Technology Centres have now been set up in most regions. By 1991, it is hoped to link them up into a national network. In 1988, several programmes were launched under the technology diffusion component of the DTI's new science and technology policy, particularly a GBP 12 (C\$26) million three-year programme to make firms more aware of the importance of the Open Systems Standards and the benefits that this can bring through the greater inter-working of IT information technology systems.</p> <p>The centers are jointly funded by DTI, Department of Education and Science and the Manpower Services Commission.</p>
FUNDING:	See above
USE:	Too early to evaluate
LAST UPDATE:	February 1991

REF. # UK-M-3	
COUNTRY:	United Kingdom
INITIATIVE:	Export IT Scheme
CATEGORY:	Marketing
GOAL:	Strengthen U.K. software exports
AGENCY:	?
DESCRIPTION:	<p>British Information Technology Export Organization (Export IT) is government-funded.</p> <p>In 1982, Export IT launched a mission to sell British software in the United States, using the slogan "British Software is the Best". Big exporters are expected to use Export IT as a market intelligence clearinghouse; the smaller companies will learn the basics of exporting. Similarly, in 1984, eight leading microsoftware companies teamed up to create the Guild of Software Houses to promote exports.</p> <p>The government provides assistance for counselling or training. The export counselling service is now run by Chambers of Commerce.</p>
FUNDING:	C\$450,000
USE:	Despite these initiatives, two thirds of software packages sold in the U.K. are of foreign origin. Billings of computer services to foreign clients have recently declined.
LAST UPDATE:	February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

NETHERLANDS

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

NETHERLANDS

Strategically located in the Centre of the Economic Community, fifteen million Dutch, crowded in an area of 42 thousand sq. km. (less than Nova Scotia), have built an advanced economy that reached by the end of 1990 the US\$295 billion level, per capita only slightly less than in Canada.

Dutch computer industry is dominated by the multinational Philips of Eindhoven, a financially troubled giant with 1990 revenues of US\$27 billion, employing over 300 thousand people. The 1990 losses reached US\$1.2 billion. In 1988, Philips computer revenues reached 1.9 billion ECU (C\$3 billion). This figure included sales of software and software services.

The Netherlands is endowed by one of the strongest publicly-owned applied research institutes in the world, TNO, which is involved in informatics research, together with other fields (#NL-I-1).

The Netherlands software market accounts for about seven percent of EEC software and software services market. In 1987, it reached 1.63 billion ECU (C\$2.65 billion). Some 58 percent, that is about C\$1.5 billion was represented by software products. The Dutch software products market is strongly dominated by US imports, which account for about fifty five percent market share.

The software and software services industry is in the Netherlands more concentrated than in the Big Four countries. The top five independent vendors account for a quarter of the market, top ten for 36 percent. The largest company is Volmac B.V. of Utrecht, with 1987 sales of C\$230 million. The Dutch software houses are keen exporters to many countries of the world. The industry, partly represented by COSSO, employed 24 thousand people in 1987.

At present, there is no government-assisted program specifically aimed at software product industry. All the initiatives mentioned below are more general in nature.

The Dutch government committed in 1984 1.7 billion DF1 (then about C\$700 million, today C\$1.2 billion, over five years (1985 - 1990) for stimulation of informatics in the Info-Stimulierung Program (INSP) administered by the Ministry of Economic Affairs (as the lead agency) responsible for coordinating technology policy of the country. (#NL-0-1).

NETHERLANDS

The two interesting features of INSP have been highlighted under separate initiative headings. The INSP plan envisaged to strengthen the Centre for Mathematics and Informatics (CWI) in Amsterdam (#NL-I-2) as a centre of excellence in the area of informatics.

The plan has also attempted to focus the Dutch advanced research. To achieve this objective, the Netherlands created an innovatively structured ad hoc SPIN network. (#NL-R-1).

As far as financing is concerned, the government policy instruments have been about 50 percent grants, 40 percent loans or loan guaranties and 10 percent the mix of the above. The new scheme of loan guarantees (up to 90 percent) for small and medium companies has been formulated recently. The three most important government granting schemes are the PBTS (#NL-F-1), BTIP (#NL-F-2) and INSTIR (#NL-F-3), described in more details under those headings. Government spending in the field of C&C&C technologies (microelectronics, computers and telecommunications) is estimated at around 400 million NFL (C\$280 million) a year. Recent tax relief measures are touched upon in #NL-T-1. It is however important to stress that by 1988, the Dutch government became much less keen on subsidizing the SP industry as they found out that subsidies were used only for improvement of existing software packages but not for any bona fide research and development.

The software product companies in the Netherlands have an access to a number of venture capital pools. The list of leading 12 pools, which indicates the funds' preference for the stages of the firm's development and the ranges in the size of capital investments, is given in detail in Ref. #NL-F-4.

The government is actively encouraging foreign software product companies to settle in the Netherlands, which brings their expertise to the country. The initiative is described in detail in #NL-0-2.

Like in other countries, some regions have more advanced since than the other in attracting new technology industries. The Dutch Silicon Triangle (Eindhoven, Nijmegen, Bosch) is the Dutch equivalent of Silicon Valley. It is profiled in #NL-I-3.

Page 3

NETHERLANDS

By 1989, the Dutch government established the last of its 18 regional innovation centers which are to build a network for diffusion of technology to smaller companies. The country has also several incubators for starting new companies. The oldest one, INDUMA B.V. of Helmond, is profiled in #NL-I-4.

Last Update: February 1991

REF. # NL-0-1

COUNTRY:

Netherlands

INITIATIVE:

Info-Stimulierung Program (INSP)

CATEGORY:

Overall

GOAL:

To attain a strong position in informatics and information technology

AGENCY:

Ministry of Economic Affairs

DESCRIPTION:

The INSP is a broad coherent plan aimed at allowing the Netherlands to attain a strong position in the rapidly developing field of informatics and information technology. The INSP includes all the relevant fields: supply of information, education, research and private and public sectors. The largest financial contributions to the carrying out of the plan are made by the Ministries of Education and Science, Economic Affairs, and Agriculture and Fisheries. Over a five-year period (1984-88), a total sum of 1,633 million NFL was involved, of which 1,155 million come from the Ministry of Economic Affairs, 240 million from Education and Science, and 127 million from Agriculture and Fisheries. In addition to these government contributions, the plan is gradually receiving more support from other sources, in particular from the business sector.

The extensive informatics plan was started in 1984 in order to bring Dutch expertise up to sufficient level to provide the Netherlands with a competitive edge and a front-runner position in some traditionally strong sectors such as agriculture and transport engineering. This plan stressed the need for reinforcing the Centre for Mathematics and Informatics (CWI) in Amsterdam (#NL-I-2) as a centre of excellence in the area of informatics and also the need to concentrate Dutch research on highly advanced fields. This latter policy aspect has been implemented by a small Stimulation Project Team for Information Technology Research (SPIN) (#NL-R-1) with experts from the research community and private sector, set up for a period of five years.

DESCRIPTION:	<p>The principal tenets of the policy aimed at reinforcing the private sector in the field of information technology are:</p> <ul style="list-style-type: none"> -- Promoting development and supporting research; -- Reinforcing the competitive position of Dutch information technology producers both at home and abroad; and -- Reinforcement and expansion of the application of information technology products on the part of Dutch users in trade and industry. <p>In order to achieve these goals, the following areas of application in the private sector have been selected:</p> <p>Office automation; production automatization; services; micro-electronics; telecommunications; and software.</p> <p>The government's role is essentially to create a favourable environment.</p>
FUNDING:	See above
USE:	T.B.D.
LAST UPDATE:	February 1991

REF. # NL-0-2

COUNTRY:

Netherlands

INITIATIVE:

"Right in the Center"

CATEGORY:

Overall

GOAL:

Attraction of foreign direct investment

AGENCY:

The Netherlands Foreign Investment Agency (NFIA)

DESCRIPTION:

The Netherlands Foreign Investment Agency (NFIA) has offered help to European, North American and Asian companies to start their operations in European Community via the Netherlands. The country offers her network of global relationships (recall, for instance, exclusive relationship with Tokugawa Japan) and her strategic location. The Netherlands has been a main gateway into and out of Europe and since mid-1940s, European distribution centre. Close to 9,000 foreign corporations have chosen the Netherlands as a base of their regional operation. Among the notable international computer companies using the Netherlands as Europe's distribution centre, Canon, Digital Equipment Corporation, Honeywell, Intergraph, Sony and Unisys, might be mentioned.

The NFIA provides current and prospective investors in Europe with cost analyses, site selection and intensive, personalized guidance through every step of the investment process. This guidance includes assistance with investment and marketing strategy formulation, identification of prospective business or joint venture partners, venture capital sources and other business experts, and introductions to key government officials throughout the Netherlands. Investment incentives are offered for investment in provinces of Limburg, Drente, Friesland and Groningen. The impact of recent changes in the Investment Premium are not yet clear.

Page 2

REF. # NL-0-2

DESCRIPTION:

All the leading U.S. software products companies, lead by Computer Associates, Microsoft, Lotus, Oracle or Ashton-tate are present in the Netherlands. A number of smaller U.S. software product companies have recently opened their European headquarters in the Netherlands: Verity Inc., Island Graphics Corp., DataEase International, Symantec Corp., SPSS Inc. and Getronics, to name the few.

FUNDING:

T.B.A.

USE:

See above

LAST UPDATE:

February 1991

REF. # NL-I-1	
COUNTRY:	Netherlands
INITIATIVE:	TNO
CATEGORY:	Infrastructure
GOAL:	Strengthen Dutch capability in strategic applied research
AGENCY:	Ministry of Education and Science
DESCRIPTION:	<p>The TNO (Organization for Applied Scientific Research) is an autonomous national <u>applied</u> research organization, with a staff of 4,700 (cf NRC 3,000) and the 1990 budget in the order of 900 million NFL (C\$630 million). Reporting to several ministries, lead by Ministry of Science and Education, it performs research in a number of fields, including industrial technologies, defence, health, environment and food.</p> <p>After the new 1985 legislation, TNO government financing was divided into a basic subsidy for background research and into special purpose commissioned medium-term research programs. Contract work from private sector exceeded one third of the budget since mid-Eighties.</p> <p>The software development activity is focused in TNO Institute for Mathematics, Informatics and Statistics (IWIS) in the Hague.</p>
FUNDING:	See above
USE:	Gradually increased percentage of contract research indicates increasing popularity with the industry.
LAST UPDATE:	February 1991

REF. # NL-I-2	
COUNTRY:	Netherlands
INITIATIVE:	CWI
CATEGORY:	Infrastructure
GOAL:	Centre of Excellence in Informatics
AGENCY:	Ministry of Education and Science
DESCRIPTION:	<p>CWI (The Centre for Mathematics and Informatics) is the leading government research institute in informatics science, located in Amsterdam. Similar to INRIA in France, it is understandably on a smaller scale. It has 150 personnel.</p> <p>The Info-Stimulierung Program (#NL-0-1) stressed the need to reinforce CWI as a centre of excellence in the area of informatics.</p>
FUNDING:	The 1990 budget is estimated to be in the order of 60 million NFL (C\$42 million).
USE:	N.A.
LAST UPDATE:	February 1991

REF. # NL-I-3	
COUNTRY:	Netherlands
INITIATIVE:	Dutch Silicon Triangle
CATEGORY:	Infrastructure
GOAL:	Create Dutch Silicon Valley
AGENCY:	NFIA
DESCRIPTION:	<p>The Dutch equivalent of Silicon Valley, called the Dutch Silicon Triangle, covers the areas encompassing the cities of Eindhoven, Den Bosch and Nijmegen. Microelectronics companies, software houses and computer equipment firms - reflecting a mixture of Dutch, North American and European organizations - concentrate their activities there.</p> <p>From personal computers to analog integrated circuits.... from wafer-cutting and chip assemblies to lithographic mask-making equipment for printing integrated circuits.... from software for the design and manufacture of custom-made chips to expert systems for such applications as manufacturing plant utilization and strategic financial analysis - these are some of the information technology business activities that are successfully being accomplished within the Dutch Silicon Triangle.</p>
FUNDING:	Reputed to be in the order of US\$250 million dollars.
USE:	Hundreds of companies, both domestic and from abroad.
LAST UPDATE:	February 1991

REF. # NL-I-4	
COUNTRY:	Netherlands
INITIATIVE:	Induma N.V.
CATEGORY:	Infrastructure
GOAL:	Create an Incubator for Start-ups
AGENCY:	Induma N.V.
DESCRIPTION:	<p>Induma started in Helmond, North Brabant a quarter of a century ago, as the developer of factory and commercial premises. Later, the company became a financier. Today, the incubator is offering a business guidance and assistance in developing new businesses. In 1984, Induma N.V. received financing of 5 million NFL (C\$3.5 million) from the European Fund for Regional Development to help to shape new economic activity in the Helmond and in Norther Brabant. Funded by the same amount of Dutch Government funds each year, Induma's ultimate aim is the creation of jobs.</p> <p>The emphasis is on the development, guidance and financing of commercial projects. Most recently, Induma is increasingly involved in company-oriented training and education in areas such as computers in the business environment, or office automation.</p> <p>Induma's supportive activity is seen as most effective in the area of providing companies with links to various levels of government or to financial institutions. Business guidance is provided not only in the fields of finance, organization and commerce, but also in technology. In all instances, Induma N.V., with a staff of five professionals, acts as a service broker.</p> <p>Induma also acts occasionally as a supplier of risk capital, with up to 20,000 NFL (C\$14,000) for start-up companies and with up to 200,000 NFL (C\$140,000) to developing companies.</p>
FUNDING:	C\$3.5 million a year.
USE:	Popular
LAST UPDATE:	February 1991

REF. # NL-F-1	
COUNTRY:	Netherlands
INITIATIVE:	Business-Oriented Technological Stimulation Programs (PBTS)
CATEGORY:	Financing
GOAL:	Stimulation of research
AGENCY:	Ministry of Economic Affairs, STIPT
DESCRIPTION:	<p>The Business-Oriented Technological Stimulation Programmes (PBTS) is a grant scheme for the stimulation of research, implemented by the newly created STIPT agency.</p> <p>The purpose of this grant scheme is not to subsidise activities that would otherwise not be taking place. It is used for the further development of knowledge already gained. The Business-Oriented Technological Stimulation Programmes give support to strategic applied research activities, including software.</p> <p>The project for which a grant can be obtained should be in the fields of biotechnology, materials, information technology or medical technology. Within each of these fields a grant can be provided for feasibility, research and demonstration projects.</p> <p>To be considered for a grant; the project should contribute to the goals of information technology: promoting information and information technology within companies in the fields of product improvement, electronic services, microelectronics in products and software.</p> <p>Project proposals are compared and ranked according to originality, quality and also to the extent to which they contribute to the goals of the programme. A "tender" system is used during an application period which is fixed in advance. Decision-making has been rendered objective through the involvement of independent experts.</p> <p>The support percentage was 37.5 percent. Accumulated government support never exceeds 50 percent of the total project costs.</p>

Page 2

REF. # NL-F-1

Page 2 REF. # NL-F-1	
DESCRIPTION:	In 1988 special emphasis was put on demonstration projects and on co-operation between companies, in 1989 the emphasis on smaller companies was increased. At present, various laws on the subject are being adjusted.
FUNDING:	The 1988 budget amounted to 134 million NFL (C\$94 million).
USE:	The program is only partially aimed at software package development.
LAST UPDATE:	February 1991

REF. # NL-F-2	
COUNTRY:	Netherlands
INITIATIVE:	Business-Oriented Technological Stimulation Programs For International Projects (BTIP)
CATEGORY:	Financing
GOAL:	Stimulation of research
AGENCY:	Ministry of Economic Affairs; STIPT
DESCRIPTION:	<p>In 1987, the government decided to strengthen the support for international technological cooperation. It is now implemented by the new STIPT agency. The grant scheme BTIP (Business-oriented Technological Stimulation Programs for International Projects) supports projects within the EUREKA framework and in bilateral international technological co-operation. The projects should be new for the Netherlands, be in high-tech, have the reasonable chance of success (only technologically and financially viable companies are eligible). The project has to have the EUREKA status or should be done in cooperation with one or more firms from another country, respectively.</p> <p>The level of the support is 50 percent for feasibility studies, 25 percent for research projects.</p>
FUNDING:	The 1988 budget amounted to 20 million NFL (C\$14 million).
USE:	Dutch companies now lead 75 of 300 EUREKA projects.
LAST UPDATE:	February 1991

REF. # NL-F-3	
COUNTRY:	Netherlands
INITIATIVE:	INSTIR
CATEGORY:	Financing
GOAL:	Stimulate research
AGENCY:	Ministry of Economic Affairs
DESCRIPTIONS:	<p>In 1984, the government launched an innovation Stimulation Scheme (INSTIR) to subsidize small and medium-sized business for wage costs associated with research and development carried out by themselves or under contract. In 1990, INSTIR had a C\$100 million budget. In this way, technological innovation is encouraged while a portion of the high costs and risks is borne by the government.</p> <p>In 1987, an additional C\$132 million was authorized by government to reinforce this national market-oriented technology policy. About a third of these funds are applied to INSTIR, with other amounts supporting specific national technological programs and pan-European cooperative efforts such as EUREKA (#EU-F-2) and ESPRIT (#EU-F-1).</p> <p>In 1989, the INSTIR program was extended for the 1989-1994 period, with even more emphasis on smaller companies.</p>
FUNDING:	See above
USE:	Frequently used
LAST UPDATE:	February 1991

REF. # NL-F-4																																																																																								
COUNTRY:	Netherlands																																																																																							
INITIATIVE:	Venture Capital																																																																																							
CATEGORY:	Financing																																																																																							
AGENCY:	N.A.																																																																																							
DESCRIPTIONS:	<p>A number of the leading dozen of venture capital pools in the Netherlands, such as Parcom Beheer, provide support for software product development.</p> <table> <tr> <th rowspan="2">Fund Managers</th><th colspan="2">Range of Individual Investments considered (all figs. in ECU '000)</th><th colspan="3">Company Development Stage</th></tr> <tr> <th>Min.</th><th>Max.</th><th>Start Ups</th><th>Develop- ment</th><th>Manbuy Out/In</th></tr> <tr> <td>Algemene Participatiemaatschappij</td><td>200</td><td>6,500</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Bunge Participatie</td><td>400</td><td>1,200</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Euroventures</td><td>na</td><td>na</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Gilde Venture Fund</td><td>100</td><td>4,000</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Halder Holdings</td><td>400</td><td>1,000</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Holland Venture Beheermaatschappij</td><td>95</td><td>380</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Intercapital Investments</td><td>750</td><td>1,500</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Mees & Hope Participaties</td><td>200</td><td>1,600</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Nederlandse Participatie Maatschappij</td><td>215</td><td>17,000</td><td>N</td><td>Y</td><td>Y</td></tr> <tr> <td>Nesbic Holding</td><td>100</td><td>2,000</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Parcom Beheer</td><td>200</td><td>4,000</td><td>Y</td><td>Y</td><td>Y</td></tr> <tr> <td>Venture Fund Rotterdam</td><td>na</td><td>4,300</td><td>N</td><td>Y</td><td>Y</td></tr> </table>					Fund Managers	Range of Individual Investments considered (all figs. in ECU '000)		Company Development Stage			Min.	Max.	Start Ups	Develop- ment	Manbuy Out/In	Algemene Participatiemaatschappij	200	6,500	Y	Y	Y	Bunge Participatie	400	1,200	Y	Y	Y	Euroventures	na	na	Y	Y	Y	Gilde Venture Fund	100	4,000	N	Y	Y	Halder Holdings	400	1,000	Y	Y	Y	Holland Venture Beheermaatschappij	95	380	N	Y	Y	Intercapital Investments	750	1,500	N	Y	Y	Mees & Hope Participaties	200	1,600	N	Y	Y	Nederlandse Participatie Maatschappij	215	17,000	N	Y	Y	Nesbic Holding	100	2,000	Y	Y	Y	Parcom Beheer	200	4,000	Y	Y	Y	Venture Fund Rotterdam	na	4,300	N	Y	Y
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FUNDING:	See above, 1 ECU at the time of writing is approximately C\$1.60.																																																																																							
USE:	Variable for individual funds																																																																																							
LAST UPDATE:	February 1991																																																																																							

REF. # NL-R-1

COUNTRY:	Netherlands
INITIATIVE:	SPIN
CATEGORY:	R&D
GOAL:	Focus Dutch research on advanced fields
AGENCY:	Ministry of Economic Affairs
DESCRIPTION:	<p>The Stimulation Project Team for Information Technology Research (SPIN) was set up in mid-Eighties for five years to focus Dutch informatics research on advanced fields, including software. The team is formed by experts from research community and from the industry.</p> <p>SPIN (The Stimulation Project Team for Information Technology Research), the small expert organization operating at an arm's length from the Government, has been set up primarily for the implementation of steering strategic research. SPIN's tasks include the setting up of research programmes in consultation with trade and industry, the scientific community and other experts and then managing these programmes. Over a five-year period, SPIN will receive a total of 50 million NFL from the Ministry of Economic Affairs and 20 million from the Ministry of Education and Science. In addition, 22 million was made available by the Ministry of Agriculture and Fisheries. The setting up of SPIN was supervised by an official working group of representatives of these three ministries. This working group served to maintain the working-level contact between SPIN and the Government.</p>
FUNDING:	The budget levels have been in the order of 90 million NFL (C\$63 million) a year.
USE:	Unclear
LAST UPDATE:	February 1991

REF. # NL-T-1

COUNTRY:

Netherlands

INITIATIVE:

Oort Committee

CATEGORY:

Tax

GOAL:

Tax Relief

AGENCY:

DESCRIPTION:

The tax reforms proposed by the Oort committee should result in general simplification of the tax system and in the general reduction in tax rates, benefitting the software product companies. On the other hand, the reduced rates are partly financed by a reduction in tax allowances.

FUNDING:

The overall tax relief is in an order of 4.75 billion NFL (over C\$33 billion).

USE:

Too early to determine.

LAST UPDATE:

February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

KOREA

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

KOREA

One of the Four Tigers of Pacific Asia, the Republic of Korea, lies south of the 38th parallel on the Korean Peninsula. On 100,000 sq. km., by 1990, live 43 million people, who have over a generation dramatically risen from the ranks of the developing world. With close to US\$4,000 per capita, their GNP has exceeded US\$170 billion.

The Republic of Korea intends to become one of the top ten technological countries of the world. To this end, she has steadily increased her investment into R&D from .4 percent of GNP in 1970, to over 2.4 percent at present. In 1989, the Ministry of Trade and Industry unveiled an ambitious plan for the development of seven strategic high technology industries in the 1990-1994 time frame. The High Technology Industries Development Council envisages 5-10 year focused plan for each sector. The total investment (capital and R&D) will amount to \$47 billion. The R&D target for 2000 is an incredible five percent of GNP.

The computer industry started in Korea only in the early 1980s. The 1983 government initiative "Information Industry Promotion Plan" has pushed the growth in the industry by average yearly gains over 60 percent. By the end of the decade, Korea produced close to \$3 billion of computers, exporting well over \$2 billion, mostly to the USA and more recently to Western Europe.

Last year, the government decided to foster further its computer industry, particularly in the mid-range systems. The government provided a 1.5 billion won (\$2.4 million) to the consortium of 15 universities to develop basic technologies for mid-size computer by the end of 1991, to be transferred to the big four companies (Samsung, Gold Star, Hyundai and Daewoo) for commercialization by 1994. The government will be investing further 8 billion won (\$13 million) in the second stage development. By 1995, Koreans expect to export over \$7 billion of computers, close to \$13 billion by the end of the decade. Beyond this, the government has plans to advance into mainframe, and even supercomputer systems.

While the advances in semiconductors peripherals and personal computers by Koreans are impressive, software remains the weakest segment of Korean computer industry.

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KOREA

There are about 400 software companies in Korea. The leading companies belong to the four leading chaebol (Ref.#K-R-1) Samsung, Goldstar, Hyundai and Daewoo. In line with chaebol tradition, the financing of the new software companies, such as Samsung data Systems, with daughter companies in the U.S. (Samsung Software America, Samsung Information Systems), comes from the profits made in other parts of their chaebol.

Most of the software effort has been in applications, using the software, developed in the U.S.A. and more recently, in Japan, for applications in the Korean context. The first word-processing packages in Korean were developed in early 1980s, both domestically and interestingly in Taiwan, by Wang.

To strengthen the software capability, the industry has been pursuing development of own operating system software. The government, for its part, initiated program SUPER to develop tools for automation of software writing. Similar to the Japanese project Sigma, the SUPER is described in some more detail in Ref.#K-R-2.

To stimulate demand for software, the government procurement policy provided a pull through large projects, like the "Nationwide Data Processing Program", and provided a push by promoting computerization of small and medium-sized firms.

Software know-how inflow policies have been increasingly encouraged by attracting multinationals to settle in Korea in wholly-owned subsidiaries (one fifth of the industry) or in relatively small number of joint venture (e.g. HP in minicomputers) under the Foreign Capital Inducement Law of 1966, several times amended since. Licensing has been more popular since mid-eighties, most of the licensors are from the USA or from Japan.

All four leading software companies have established companies in the Silicon Valley or in Route 128 area of the U.S., to obtain first hand knowledge or the state-of-art technology in addition to the intimate knowledge of the Northamerican market.

Despite its remarkable education (Ref.#K-H-1) and training programs (Ref.#K-H-2), Korea still suffers from software talent shortages. One interesting feature of the policy is the drive to attract the Koreans educated and trained in the U.S.

Last Update: February 1991

REF. # K-I-1	
COUNTRY:	Republic of Korea
INITIATIVE:	Daedok
CATEGORY:	Infrastructure
GOAL:	Build a Technopolis
AGENCY:	Economic Planning Board (EPB)
DESCRIPTION:	<p>In the 1970s, the government of the Republic of Korea decided to construct a completely new science town of Daedok about 150 km south from the capital, Seoul. Five major R&D institutes formed Daeduk core, covering shipbuilding, mechanical engineering, oceans research, petrochemicals and most relevantly, electronics and telecommunications, which was completed in 1979.</p> <p>The Korean Institute of Technology (KIT), located in Daedok, is Korea's elite institution of higher learning, focusing on training undergraduates.</p>
FUNDING:	Estimated in the order of hundreds millions of dollars.
USE:	Popular
LAST UPDATE:	February 1991

REF. # K-H-1	
COUNTRY:	Republic of Korea
INITIATIVE:	Education
CATEGORY:	Human Resources
GOAL:	Prepare Koreans to become a leading high-tech nation.
AGENCY:	Ministry of Trade and Industry Ministry of Education
DESCRIPTION:	<p>The national enthusiasm for education is well known. By the beginning of the nineties, nearly fifty percent high school graduates advanced into post-secondary education. This top of the ruthlessly meritocratic and elitist educational pyramid features 688 vocational colleges, with 860 thousand students, and 442 colleges and universities, with 1,340 thousand students (proportionately 1.75 times more than Canada). The quantity is impressive, the quality less so, according to the critics, who point out that the system is overcrowded and that the facilities are poor. One quarter of students have selected engineering for their major. There has been an ever increasing emphasis on science and technology. The leading technical undergraduate institution is Korean Institute of Technology (KIT) in Daedok (Ref.#K-I-1), the leading postgraduate institution is the Korean Advanced Institute of Science and Technology (KAIST). Furthermore, the country has had a large program of advanced education abroad for the 25,000 best and brightest, mostly in the United States, more recently in Japan.</p> <p>In the nineties, science and technology education will play a much greater role. Science and mathematics will be central to the curricula throughout the pyramid. The 1990 MTI five-year plan calls for additional 40 thousand Masters and PhDs in science and engineering, as well as for 120,000 engineers and technicians, increasing the present numbers by a half.</p>
FUNDING:	The budget for education should increase from 3.4 percent GNP in 1988 to 4.7 percent GNP, by the year 2000.
USE:	Widely popular
LAST UPDATE:	February 1991

REF. # K-H-2	
COUNTRY:	Republic of Korea
INITIATIVE:	Training
CATEGORY:	Human Resources
GOAL:	Train the workforce for the 21st century.
AGENCY:	The Blue House/Economic Planning Board
DESCRIPTION:	<p>Korea has developed a diverse array of training mechanisms-private and public, formal and non-formal, institutional and on-the-job-to meet the growing need for computer related skills. The public formal training is administered by the Ministry of Education, the non-formal by the Office of Labour Affairs.</p> <p>The government called upon private companies to start training courses for their own employees. Since 1975, the skill training programs are now compulsory for all companies with over 200 personnel.</p> <p>The private Technical Institutes of the Samsung and Hyundai are considered among the best in the country.</p>
FUNDING:	T.B.A.
USE:	Very popular
LAST UPDATE:	February 1991

REF. # K-R-1	
COUNTRY:	Republic of Korea
INITIATIVE:	Chaebol
CATEGORY:	R&D
GOAL:	Develop Software Capability Fast
AGENCY:	Economic Planning Board
DESCRIPTION:	<p>The easing of credit curbs of chaebol in January 1991 indicates that the government has decided to rely again (after 1984 to 1990 hiatus) on them for technological development. In the development of software production capability, the government pins their hope on the leading four chaebol.</p> <p>Created in 1960s and 1970s, chaebol are huge industrial groups, somewhat similar to the Japanese keiretsu, but typically family controlled. There are about fifty such groups in Korea. The largest are multibillion dollar conglomerates, with tens of thousands of employees.</p> <p>Among the chaebol, involved in software, one must list at least the following four.</p> <p>Samsung, leads the pack with 1989 sales of US\$31 billion. In informatics, it is involved in electronics, in semiconductors, telecommunications and computers. Samsung wants to become IBM of Korea. Its R&D activity amounts to close to US\$ one billion. The R&D Centre is modelled on that of Toshiba. Staffed with 800 researchers in 1988 in Korea, it had 100 researchers in the USA. It has cross-licensing agreements with IBM. Samsung manufactures in the USA and in Europe. The Samsung Data Systems has two daughter companies in the USA - Samsung Software America and Samsung Information Systems.</p> <p>The other three leading chaebol are the latecomer Hyundai, better known for its ships and cars, with total 1989 annual sales of US\$28 billion, the technologically respected Lucky Goldstar with annual sales of US\$23 billion in 1989 and Daewoo, with US\$15 billion sales in that year.</p> <p>The leading three participated in the VLSI project to develop 4MB chip, all four participate in the project to develop minicomputers by 1994 and all are leaders in the SUPER project (Ref.#K-R-2).</p>
LAST UPDATE:	February 1991

REF. # K-R-2	
COUNTRY:	Republic of Korea
INITIATIVE:	Super
CATEGORY:	R&D
GOAL:	Development of Software Production Tools.
AGENCY:	Korea Electronic Industry Coop.
DESCRIPTION:	<p>An industry-government long-term R&D project, jump started by the Ministry of Trade and Industry, financed jointly by the government and the participating companies.</p> <p>The purpose of the project is to increase software productivity writing by automating software development process.</p> <p>The SUPER project consists of the SUPER centre, of the SUPER network and of the SUPER users' sites.</p> <p>Among the leading participants are companies such as Samsung, Goldstar, Hyundai and Daewoo.</p> <p>Experimental software tools are being developed.</p>
FUNDING:	T.B.A.
USE:	Too early to evaluate
LAST UPDATE:	February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

TAIWAN

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

TAIWAN

One of the Four Tigers, Taiwan, a small island (size of Lake Erie), has the population of over 20 million. Taiwan's economy, with a 1988 GNP of \$120 billion (about the GNP of Switzerland) exports over a half of its GNP. Taiwan at present spends close to \$3 billion on R&D.

A decade ago, Taiwan government decided to promote informatics as one of the two strategic industries for the shift towards skill and knowledge-intensive economy. Today, electronics is a top export, informatics should top the list by mid-nineties.

The two-prong strategy has two thrusts:

- 1) cooperation with global players in informatics achieved by attracting them to the island;
- 2) strengthening the indigenous capability in informatics by R&D spending and by purchasing key technologies abroad.

The catalyst of Taiwan's new development strategy is the Hsinchu Science-Based Industrial Park, described in more detail in Ref.#T-I-1.

Another important initiative is the creation of the software development non-profit organization, the Institute for the Information Industry (III), (see Ref.#T-R-1).

Interestingly, the informatics development stimulated inflow of the large number of overseas Chinese entrepreneurs and experts from abroad.

Yet another interesting feature in the initiatives is the establishment of an R&D facility in the Silicon Valley by one of the largest private companies, UMC.

By the end of the eighties, informatics output exceeded \$6 billion, of which software accounted for some \$600 million. According to the Institute for Information Industry, Taiwan intends to evolve also into a leading software developer, despite the expected shortage of talent ahead. The software packages niche are Chinese language programs, such as word processing, spreadsheets or a database management, being produced since 1985.

Last Update: January 1991

REF. # T-I-1

COUNTRY:	Taiwan
INITIATIVE:	Hsinchu
CATEGORY:	Infrastructure
GOAL:	Build the first industrial park in Asia devoted to high technologies.
AGENCY:	SIPA Hsinchu, Taiwan, R.O.C.
DESCRIPTION:	<p>Taiwan's answer to Silicon Valley challenge, the government-run Hsinchu science-based industrial park was established in 1980 about 50 miles south from Taipei.</p> <p>The park authority fosters tri-partite cooperation between ITRI government laboratories, Tsinghua and Chiao Tung Universities and industry.</p> <p>By 1989, SIPA attracted more than 100 companies, with more than 15,000 employees. The 2100-hectare park generates a turnover of close to \$2 billion.</p> <p>Foreign investors are attracted to the park with five year tax holidays, five-year free rental of land, low-cost loans, accepting patents and knowhow as equity capital (up to 45 percent of the total), as well as with allowing 100 percent ownership.</p>
FUNDING:	Unconfirmed at present
USE:	<p>So far, a score of multinationals came to the park, lead by companies such as IBM, AT&T, Philips, and Wang.</p> <p>Successfully reversing the brain drain, the authority succeeded to attract three dozens companies owned by overseas Chinese, mainly from the U.S.</p> <p>Some sixty endogenous companies are lead by \$1 billion company ACER, manufacturer of PC.</p>
LAST UPDATE:	January 1991

REF. # T-R-1	
COUNTRY:	Taiwan
INITIATIVE:	Institute For Information Industry (III)
CATEGORY:	R&D
GOAL:	Create a national software development institute
AGENCY:	Institute for Information Industry Taipei, Taiwan, R.O.C.
DESCRIPTION:	<p>The Institute for Information Technology (III) was founded in 1979. The III is jointly supported by government, academia and industry. Of 43 trustees there are six from the government, seven from academia and 31 from industry. The main mission of III is software development. The secondary mission is providing advice and guidance to both private and public sector.</p> <p>The Institute has a staff of about 300, divided into six divisions: Research, Development, Systems Engineering, Education/Training, Promotion and Administration (incl. planning and evaluation, computer centre).</p> <p>Among the first achievements, the development of the Big Five software package (Chinese language word processing, file management, spreadsheet, business graphics and data communication) must be mentioned.</p>
FUNDING:	To be confirmed.
USE:	To be confirmed.
LAST UPDATE:	January 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

SINGAPORE

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

SINGAPORE

One of the "Four Tigers" of Pacific Asia, Singapore is a tiny island state, of 622 sq.km, with 2.7 million people. With GNP per capita approaching US\$10,000, its GNP is close to US\$27 billion. Located strategically between Indian and Pacific Oceans, it is dependent on international trade, the volume of which exceeds three times its GNP.

Building on its previous success after the development lift-off, by 1986/87 the Government of Mr. Lee Kuan Yew formulated its National Information Plan for Information Technologies, that are to bring Singapore into the ranks of developed countries by the end of the century. The comprehensive plan (#SG-0-01) coordinated by the National Computer Board is reputedly pouring over a billion dollars into building the informatics infrastructure and various support initiatives that include support for software companies.

The individual government initiatives are described in more detail under their respective references.

- o The Singapore Science Park is an attempt to build a miniversion of the Silicon Valley infrastructure (#SG-I-1).
- o The training of software industry professionals is coordinated by the National Computer Board (#SG-H-1), some training is financed from the US\$100 million plus Skill Development Fund of the National Productivity Board (#SG-H-2). The Japan-Singapore Institute for Software Technology plays an important role (#SG-H-3).
- o The government does not provide outright financing for the industry, but offers generous tax concessions, which start with 5 to 10 year tax holidays (#SG-T-1), to attract foreign investors.
- o In R&D category, RDAS, PDAS and DSAS grants are available (#SG-R-1). The exploitation of the domestic vertical markets, such as TRADENET is a notable success (SG-R-2).
- o Several million dollars a year are spent on marketing support for the companies under programs such as MDAS, BDS or IMA (#SG-M-1).

Last Update: February 1991

REF. #: SG-0-1	
COUNTRY:	Singapore
INITIATIVE:	National Plan for Information Technology
CATEGORY:	Overall
GOAL:	Make Singapore a developed country by the year 2000.
AGENCY:	National Computer Board (NCB)
DESCRIPTION:	<p>The National Plan for Information Technology was formulated by the Singaporean Government in 1986/1987.</p> <p>The NCB is responsible for the overall coordination of the Plan, the Plan aims at creating an electronics infrastructure for the city-state and at coping with the shortage of human resources by increasing their productivity.</p> <p>Individual initiatives coordinated by NCB are listed under their separate headings.</p> <ul style="list-style-type: none"> o National Science Park (Ref. #SG-I-1) o National Productivity Board (Ref. #SG-H-1) o NCB Human Resources (Ref. #SG-H-2) o JSIST (Ref. #SG-H-3) o Tax Free Holidays (Ref. #SG-T-1) o RDAS/SDAS/PDAS (Ref. #SG-R-1) o Market Niches (Ref. #SG-R-2) o MDAS, BDS, IMA (Ref. #SG-M-1)
FUNDING:	Over one billion dollars.
LAST UPDATE:	February, 1991

REF. #: SG-I-1	
COUNTRY:	Singapore
INITIATIVE:	Singapore Science Park
CATEGORY:	Infrastructure
GOAL:	To establish a mini Silicon Valley in Singapore
AGENCY:	National Computer Board (NCB)
DESCRIPTION:	<p>The Singapore Science Park was established by the Singapore government to encourage and accommodate local and foreign companies to engage in R & D activities related to Information Technology, particularly the software industry. The Park maintains land sites, starter units, incubation units, the Software Technology Center (STC) and the Center for Information Technology (CINTECH). Software companies located in the Singapore Science Park are said to be paying reasonable rental fees for their premises.</p>
FUNDING:	It is estimated that over US\$100 million has been poured into the building of the Park.
LAST UPDATE:	February 1991

REF. #: SG-H-1	
COUNTRY:	Singapore
INITIATIVE:	NCB
CATEGORY:	Human Resources
GOAL:	Catch up with the West by 2000
AGENCY:	National Computer Board (NCB)
DESCRIPTION:	<p>The only resource this country has is human resource, hence human resources development is deemed very important by the Singapore government. The National Computer Board (NCB) which was set up by the government, has among its many mandates - to train software industry professionals for the country. NCB is the coordinating agency for software education programs and training activities in Singapore.</p>
FUNDING:	Variable
USE:	Very popular with local and attracted software companies.
LAST UPDATE:	February 1991

REF. #: SG-H-2	
COUNTRY:	Singapore
INITIATIVE:	National Productivity Board (NPB)
CATEGORY:	Human Resources
GOAL:	Increase productivity of employees
AGENCY:	NPB
DESCRIPTION:	<p>The National Productivity Board (NPB) was formed with the overall responsibility of developing and implementing programs to assist local firms in upgrading the skill level and productivity of employees. Particular emphasis is given to less technically skilled workers. The courses conducted by NPB include business management skills, computer-related skills, and others. NPB has a division known as the Skill Development Fund (SDF) which offers grants to cover external, in-house and overseas training. For SDF approved courses, local institutions grants cover up to 70 percent of the course fees.</p>
FUNDING:	SDF is said to have a fund in excess of US\$100 millions.
USE:	NPB is very popular among foreign software companies located in Singapore.
LAST UPDATE:	February 1991

REF. #: SG-H-3	
COUNTRY:	Singapore
INITIATIVE:	JSIST
CATEGORY:	Human Resources
GOAL:	Train Senior Computer Experts
AGENCY:	JSIST
DESCRIPTION:	<p>The Japanese-Singaporean Institute for Software Technology (Masao Teraoka, President) was set up in 1982 with the help of the Japanese government to help training senior computer professionals. Japan will suffer from acute software writer shortage. Singaporeans, who have learned Japanese and Japanese language programming, will help staff overseas offices of Japanese companies, especially in China.</p> <p>The Japanese provided the Institute with free NEC computers, worth \$16 million. At least 200 stations help to train Singaporean talent.</p> <p>The Institute has already graduated a couple of thousand people. By now, Singapore has over 9,000 software writers.</p> <p>Singapore has initiated a number of education/training cooperation schemes setting up institutes of technology, technical institutes and craftsmen training centres in collaboration with Germany, France, U.K., India and Netherlands.</p>
FUNDING:	To be determined.
USE:	Very popular with Japanese multinationals.
LAST UPDATE:	February 1991

REF. #: SG-T-1	
COUNTRY:	Singapore
INITIATIVE:	Tax-free holidays for FDI
CATEGORY:	Taxation
GOAL:	Encourage High Tech Industries to set up bases in Singapore.
AGENCY:	JSIST
DESCRIPTION:	<p>The normal corporate tax in Singapore is 31 percent on profits. Singapore government does offers tax incentives to software and other high-tech industry trying to established a base in this country. Tax incentives such as Pioneer Status or five to ten years tax-free holidays is very popular among investors.</p> <p>Other tax incentives in Singapore are investment allowances - exemption of taxable income of an amount equal to a specified proportion (up to 50 percent) of new fixed investment; Post-Pioneer status - Corporate tax rate of 15 percent for up to 5 years upon expiry of pioneer or export incentive; Expansion Incentive - Approved service activities, exemption of 31 percent tax from pioneer activity, tax relief period up to five years; Operational Headquarters (OHQ) - Income arising from the provision in Singapore of approved services will be taxed at 10 percent.</p>
FUNDING:	Not applicable.
USE:	Very popular among potential investors. 600 multinationals, such as NEC, HP or Apple have located here.
LAST UPDATE:	February 1991

REF. #: SG-R-1	
COUNTRY:	Singapore
INITIATIVE:	RDAS/PDAS/SDAS
CATEGORY:	R&D
GOAL:	Promote more R&D activities in Singapore.
AGENCY:	NST/EDB
DESCRIPTION:	<p>There are many initiatives and programs to assist the software industry in Product Research and Development. The major ones are as follows: R & D Assistance Scheme (RDAS) - RDAS grants, administered by the National Science and Technology (formerly known as Singapore Science Council), provide funding for local companies engaged in longer term R & D projects. The grants can range from US\$50,000 to US\$2.5 millions per project; Product Development Assistance Scheme (PDAS) - administered by the Economic Development Board (EDB), provides grants or interest-free advances to defray part of the cost incurred in product or process development. In general, the level of support is up to 50 percent of the direct costs which may include manpower costs, consultancy fees, overseas travelling expenses and charges for technology searches. Software Development assistance Scheme (SDAS) - administered by NCB and funded under the PDAS scheme, provides grants, interest free advances, and a subsidiary of up to 50 percent to cover the development costs of a product including feasibility study (subject to a maximum of US\$2,500).</p> <p>The Singapore government has recently upgraded the Singapore Science Council to a statutory board known as National Science and Technology Board emphasises the importance it places in promoting R & D activities.</p>

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Ref. #: SG-R-1

FUNDING:

To be determined.

USE BY INDUSTRY:

Very popular with the software industry.

LAST UPDATE:

February 1991

REF. #: SG-R-2

COUNTRY:	Singapore
INITIATIVE:	Vertical Market Niches
CATEGORY:	R&D
GOAL:	Exploit learning related to the application of new technology in key industries.
AGENCY:	NCB, MRT, Port Authority, various other agencies.
DESCRIPTION:	<p>The Singaporean government has sponsored computerization programs in such major sectors as subway management (MRT), port management (Port Authority), airline management (Singaporean Airlines), libraries, school (Schoolink - 400 schools), health (MEDINET), justice (LAWNET), land registry and utilities.</p> <p>The software packages are developed primarily for the domestic market. The software has of course also some export potential. For instance, the port management system software Tradenet, using expert systems and NEC supercomputer, has been admired abroad.</p>
FUNDING:	Embedded in various department budgets.
USE:	The systems integrators are ecstatic about the programs.
LAST UPDATE:	February 1991

REF. #: SG-M-1	
COUNTRY:	Singapore
INITIATIVE:	MDAS, BDS, IMA
CATEGORY:	Marketing/Sales/After-Sales
GOAL:	Defray the risks of local companies involved in export marketing.
AGENCY:	TDB, EDB
DESCRIPTION:	<p>Singapore government normally does not actively participate in the marketing and sales effort of the software company. Singapore Trade Development Board (TDB) does offer some marketing support to local companies.</p> <ul style="list-style-type: none"> o Market Development Assistance Scheme (MDAS) - provides cash grants to local companies to undertake export promotional activities. Financial assistance is given on a cost-sharing basis with a maximum grant of 50 percent of the eligible expenses incurred. The types of activities qualifying for assistance under the scheme are: marketing trips and participation in overseas trade fairs and trade missions aimed at developing new markets, tendering for overseas projects, setting up marketing office overseas, and printing of company brochures for distribution overseas. o Business Development scheme (BDS) - organised by EDB offers grants to assist companies seeking marketing arrangements, technological tie-ups or partnerships with foreign firms; International Marketing Assistance (IMA) - TDB organizes trade missions and participation in international trade fairs for local companies to promote their products and services in both established and new markets. No After-Sales support initiatives or programs are provided by the Singapore government.

Page 2
Ref. #: SG-M-1

FUNDING:

Said to be into several million dollars a year, variable from year to year.

USE BY INDUSTRY:

Frequent, very popular among local companies, especially the initiatives administered by TDB.

LAST UPDATE:

February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

INDIA

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

INDIA

The federal republic of India, with a 1990 population base of 854 million, living on a land mass of 3.2 million sq.km., forms in fact a quasi-continental, relatively closed economy. Imports are less than eight, while exports are less than six percent of GNP.

Until the early eighties, India pursued a strategy of technological self-sufficiency, with dominant emphasis on development of indigenous technology. Import substitution policy succeeded in effectively curtailing technology imports, but the domestic R&D did not succeed in developing replacements.

New Computer Software policy of 1984 liberalized importation of software packages. Foreign collaboration has also expanded very substantially since mid-1980s. Nevertheless, the indigenous companies are still overprotected. Exports are supported by making foreign exchange available for marketing abroad by tax relieve of 40 percent and by cash compensatory payments. The Department of Electronics (DOE) has an overall responsibility for software.

India's competitive advantage is based on inexpensive (1/6 US level), but qualified human resources. In computer related field, the education system adds yearly 4,000 university graduates and 10,000 technical personnel to a vast pool of talent of over 200,000 (for more see #IN-H-1). A network of training institutions is being created (#IN-H-2).

India has also focussed on strenghtening its technological infrastructure. The government fostered growth of technology agglomerations, of which Bangalore (#IN-I-1) and SEEPZ (#IN-I-2) are the best known examples. The federal government also created the national software development centre NCST (#IN-R-1).

Of particular interest is an effort to use the Indian diaspora of 25 millions Indians living abroad, as a source of capital, know-how, and for marketing purposes.

PRESENT CAPABILITY.

About 500 groups are engaged in software activities. Of these, about 45 substantial indigenous companies are involved in writing software packages, ranging from trivial astrological programs to sophisticated data base management systems. The exclusive niche is formed by the Indian languages software. The government used procurement to develop particular vertical niches (#IN-R-2).

Page 2
INDIA

Since 1983, the software products have been exported to North America, to EEC, to the USSR, Middle East, Singapore and English speaking Oceania. The volume of exports already by early-eighties exceeded one billion RS. India expects software exports to exceed \$300 million this year.

India has also succeeded in creating a platform on which multinational computer companies such as Taxas Indstruments or Cullinane, develop their packages, using the inexpensive talent.

Last Update: January 1991

REF. # IN-I-1	
COUNTRY:	India/Karnataka
INITIATIVE:	Bangalore
CATEGORY:	Infrastructure
GOAL:	Develop Bangalore as a strategic location for nurturing key industries (especially defence and aerospace) that will be based on advanced technologies.
AGENCY:	Keonics
DESCRIPTION:	<ul style="list-style-type: none"> o Bangalore, an inland city, with a moderate climate, with a relatively dust-free environment, with accessibility by air and road, a city endowed with scientific and educational institutions, has become over the last two decades the hub of India's version of Silicon Valley. o Bangalore today is a nerve centre of India's aerospace and defense industry. o The major competitive advantage of Bangalore is the availability of highly educated and well qualified software manpower. o Equally important is a relatively low cost of software talent (one sixth of USA). o Dedicated satellite link connects Bangalore with North America (installed by Texas Instruments).
FUNDING:	Unknown at present
USE:	<ul style="list-style-type: none"> o Three dozens of multinationals have been attracted to Bangalore. Leading software companies have been Texas Instruments, Hewlett-Packard, ANZ.Le Groupe Bull manufactures there the mainframes. o Software volume produced in 1989/1990 was 400 million Rs (US\$23 million).
LAST UPDATE:	January 1991

REF. # IN-I-2	
COUNTRY:	India/Maharastra
INITIATIVE:	SEEPZ
CATEGORY:	Infrastructure
GOAL:	Create free trade zone focussed on high technology
AGENCY:	Santa Cruz Electronics Export Processing Zone Authority Government of India, Ministry of Commerce, Andheri (East), Bombay - 40096 India.
DESCRIPTION:	Santa Cruz Electronics Export Processing Zone (SEEPZ) near Bombay was created by Government of India in 1974. Three years later the first exports from the zone started. By mid-eighties they grew up to close US\$100 million.
FUNDING:	At present unknown
USE:	In addition to Indian software companies, such as Patni Computer Systems, Tata Consultancy Services and Usha, the zone attracted at least two dozens foreign high tech companies, about half from the USA. Cullinane was the first U.S. software company to establish itself in the zone. By 1983, Usha sold their first software package in North America.
LAST UPDATE:	January 1991

REF. # IN-H-1	
COUNTRY:	India
INITIATIVE:	Computer Education
CATEGORY:	Human Resources
GOAL:	Create a vast pool of computer trained manpower
AGENCY:	Electronics Commission Department of Electronics (DOE) Central Advisory Board on Education
DESCRIPTION:	<p>India has over 3 million students in their higher education and vocational school system. India has over 80 universities, 4000 colleges and over 140 technical institutes and technical colleges. The Union has had a huge pool of people well trained in mathematics and statistics.</p> <p>In 1970 government set up the Electronics Commission, which developed framework of India's policy of self-reliance, particularly in labour intensive software writing. Most software today is in fact developed indigenously and a substantial amount is exported.</p> <p>Today, about 40 universities and institutions have undergraduate and graduate programs in computer sciences. They train about 4,000 persons a year. The lower level training provided by various private and public organizations, graduating about 10,000 persons a year.</p>
FUNDING:	Statistics unavailable
USE:	About twenty indigenous companies are involved in writing application packages. The leading companies are TCS, EIL, Computronics and ASCI. Software is exported not only to North America, but also EEC, USSR, Middle East oil-producing countries, Singapore, Australia and New Zealand.
LAST UPDATE:	
	January 1991

REF. # IN-H-2	
COUNTRY:	India
INITIATIVE:	NICNET
CATEGORY:	Human Resources
GOAL:	Create a nationwide software training network
AGENCY:	Department of Electronics (DOE)
DESCRIPTION:	<p>The Department of Electronics in consultation with the Department of Education and UGC, will set up a chain of four Indian Institutes of Informatics Technology (IIITs) in each of the four regions of the country, and affiliated institutes in each of the State capitals. The network of super computer/mainframe computer/super mini computers and mini/micro computers, and staffed by the specialist personnel of the National Informatics Centre, NICNET, would form the basic infrastructure which will be utilised by IITs and their affiliated institutes. The affiliated institutes will have the status equivalent to National institutes like IITs. Training will use modern concepts like computer aided instruction, computer network-based open-university system, computer-aided aptitude evaluation and modular training systems.</p>
FUNDING:	Unclear at present
USE:	Unclear at present
LAST UPDATE:	February 1991

REF. # IN-R-1	
COUNTRY:	India
INITIATIVE:	National Centre for Software Technology (NCST)
CATEGORY:	R&D
GOAL:	Catalyzing Software Development
AGENCY:	Electronics Commission UNDP
DESCRIPTION:	<p>The National Centre for Software Development and Computing Techniques (NCSDCT), Bombay was established in 1975 with UNDP assistance for "catalyzing" software development. The centre integrated several indigenous programs for execution of large programs. Software developed includes some systems software (eg. operating systems), an interface unit that allows an indigenously produced system to act as a RJE station for the larger host system, computer aided design software and computer graphic programs. The centre has also undertaken activities in computer education and training as well a in promotion of applications.</p> <p>By 1986, the centre was enlarged and upgraded into the National Centre for the Software Technology (NCST).</p>
FUNDING:	Unknown at present
USE:	Unknown at present
LAST UPDATE:	January 1991

REF. # IN-R-2	
COUNTRY:	India
INITIATIVE:	Vertical Market Niches
CATEGORY:	R&D
GOAL:	Exploit learning related to the application of new technology in traditional industries.
AGENCY:	Various agencies
DESCRIPTION:	<p>The Indian government has sponsored computerization programs in such major sectors a railroad management, power generation and distribution, steel and coal production, airline management and hydrology.</p> <p>The software packages are developed primarily for the huge domestic market. The software has of course also some export potential. For instance, the railway management system software has been sold abroad. Indian companies offer at present close to a hundred lincensed software packages for sale, in a score of vertical markets niches. In the private sector, on the other hand, a garment industry software package, developed for export, has been purchased by manufacturers in Bombay and Delhi.</p> <p>The above work enables the companies to undertake prestigious software development work abroad. The Indian claim for instance, that SWISSAIR airline reservation system was developed by them.</p>
FUNDING:	Embedded in various department budgets.
USE:	Quite popular with the systems integrators.
LAST UPDATE:	February 1991

**A SURVEY OF
INITIATIVES TO SUPPORT SOFTWARE INDUSTRY
IN SELECTED COUNTRIES**

BRAZIL

INDUSTRY SCIENCE AND TECHNOLOGY CANADA

ZZ INTERNATIONAL

THE COOPERS & LYBRAND CONSULTING GROUP

MARCH 1991

BRAZIL

Brazil is a fifth largest country of the world, with territory of 8.5 million sq. km. and a population of 150 million, that is expected to grow to 180 million by the end of the decade. It has the world's eighth largest economy, of US\$330 billion, accounting for about half of the economic activity of South America.

Strategic importance of informatics for national development was recognized in Brazil in the early 1970s. The industry was established only in late seventies. Today, the market is over US\$3.5 billion.

The well-known highly interventionist government initiatives, aimed at the creation of indigenous industry, have relied heavily on import-substitution growth strategies. The executive agency charged since 1972 with the informatics initiative was first CAPRE, in 1979 succeeded by Secretaria Especial de Informatica (SEI). In 1984, the Informatics Law was enacted. The law gave birth to presidential advisory body CONIN and the National Informatics and Automation Plan.

The policy of market reserve lead to strong compression of imports, inadequately matched by strengthening of the R&D base. Despite the environment of foreign debt burden and severe foreign exchange shortages, Brazil indeed created a domestic industry in microcomputer and minicomputer segments, but at a price of technological obsolescence and a quasi trade war with the USA.

In 1988, the Software Law, similarly controlling software, was enacted. Requiring SEI registration of software, proof of existence of no similar Brazilian product before import of foreign software, and limiting sales to domestic vendors, the regulation practically cut Brazil off the global software trends.

The new government of President Collor de Mello promised not only large privatization, but opening of Brazil to imports. The subsidies to domestic companies were suspended. Informatics, however, was still included among the few exceptions to general liberalization. The government abolished SEI and replaced it with Science and Technology Office (SCT). Informatics regulation is to be eased only gradually up to October 1992. The formation of technological joint ventures has been allowed since October 1990 and the first such venture (with IBM) was indeed authorized. Close to \$1 billion government fund is to be injected into the domestic industry over the next three years to compensate for a relaxation of import protection.

Last Update: February 1991

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