A STATISTICAL PROFILE OF THE INFORMATION PROCESSING INDUSTRY

BY: JEET HOTHI

LOUISA BATTISTELLI

TECHNOLOGY ASSESSMENT DIVISION

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INTRODUCTION

THIS REPORT DESCRIBES QUANTITATIVELY VARIOUS INDUSTRIES DEALING WITH INFORMATION AND COMMUNICATIONS PRODUCTS AND SERVICES. THE INFORMATION IS COLLECTED FROM VARIOUS SOURCES SUCH AS STATISTICS CANADA, OTHER GOVERNMENT REPORTS AND STUDIES, INDUSTRY CONSULTING FIRMS, E.G, A.D. LITTLE, GARTNER GROUP, INTERNATIONAL DATA CORPORATION, EVANS RESEARCH CORPORATION AND TRADE NEWSLETTERS.

THE INFORMATION IS PRESENTED IN THE FORM OF GRAPHS ALONG WITH A BRIEF DESCRIPTION HIGHLIGHTING ANY IMPORTANT FEATURES OR TRENDS. THE REPORT IS MEANT TO BE USED AS A REFERENCE DOCUMENT. THE FOLLOWING ARE EXAMPLES OF THE TYPE OF INFORMATION PRESENTED IN THIS REPORT:

THE CANADIAN MARKET FOR INFORMATION PROCESSING PRODUCTS (HARDWARE AND SOFTWARE) WAS WORTH ABOUT $7 BILLION IN 1985 AND APPEARS TO BE MATURING AT 1.5% OF GDP (GROSS DOMESTIC PRODUCT).

IN TERMS OF REVENUES GENERATED, HARDWARE DOMINATES THE MARKET WITH A SHARE OF APPROXIMATELY 70% AND IS EXPECTED TO DOMINATE OVER THE NEXT FEW YEARS.

OF ALL THE INFORMATION PROCESSING PRODUCTS, THE GROWTH RATE OF SOFTWARE HAS BEEN THE FASTEST, 30-40%, COMPARED TO THE AVERAGE GROWTH RATES OF 15-20%. HOWEVER, THE SOFTWARE REVENUE SHARE IS STILL ONLY 14% OF THE TOTAL REVENUE OF INFORMATION PROCESSING PRODUCTS AND IS EXPECTED TO GROW TO ONLY 17% BY 1991.

THE CANADIAN MARKETPLACE IS DOMINATED BY U.S. OWNED FIRMS WHICH ACCOUNT FOR 70% OF REVENUES. CANADIAN COMPANIES ACCOUNT FOR APPROXIMATELY 25% OF THE MARKETS, MOSTLY IN THE AREAS OF PROCESSING SERVICES, CONSULTING AND CUSTOM SOFTWARE.

NOT ONLY THE HARDWARE, EVEN THE SOFTWARE FIELD IS DOMINATED BY THE U.S. OWNED FIRMS WHICH ACCOUNT FOR 65% OF THE TOTAL SOFTWARE REVENUES. THE CANADIAN COMPANIES HAVE A RATHER WEAK POSITION IN BOTH APPLICATION SOFTWARE AND SYSTEM SOFTWARE. THEY ARE RELATIVELY STRONG IN CUSTOM SOFTWARE. UNFORTUNATELY CUSTOM SOFTWARE IS PROJECTED TO GROW THE LEAST, ONLY BY APPROXIMATELY 5%.

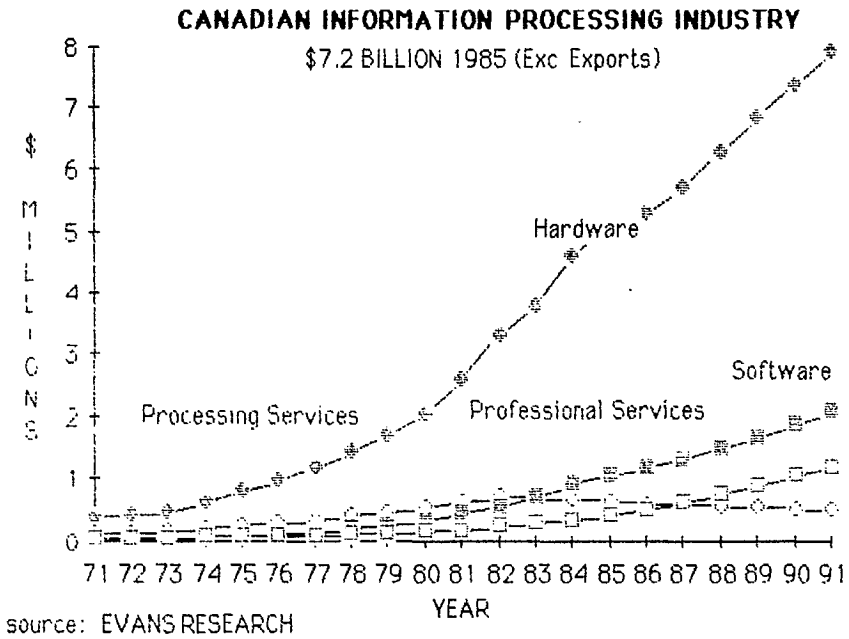
THE U.S. ACCOUNTS FOR OVER HALF (54%) OF THE WORLD MARKET FOR INFORMATION PROCESSING PRODUCTS, WHICH WAS WORTH $207 BILLION IN 1985 JAPAN'S SHARE IS MUCH SMALLER AT 14% AND WESTERN EUROPE ACCOUNTS FOR 28%. THESE SHARES ARE EXPECTED TO STAY ABOUT THE SAME OVER THE NEXT 10 YEARS.

OF THE TOP 20 EDP (ELECTRONIC DATA PROCESSING) COMPANIES, IBM ALONE ACCOUNTED FOR 45% OF THEIR COMBINED REVENUES WITH AN ANNUAL REVENUE OF ALMOST $50 BILLION IN 1985 THE U.S. COMPANIES ACCOUNT FOR 81% OF THE TOTAL REVENUE OF THIS GROUP. THE JAPANESE COMPANIEWS ACCOUNT FOR ONLY 12.6% AND EUROPEAN COMPANIES ACCOUNT FOR ONLY 6.6%. THE FEAR OF JAPANESE DOMINATION OF THE INFORMATION FIELD WOULD THUS APPEAR TO BE EXAGGERATED.

TELECOMMUNICATIONS CARRIERS IN CANADA DERIVED REVENUES OF $11 BILLION IN 1985, WITH BELL CANADA ACCOUNTING FOR 52%.

TELEPHONE ACCOUNTS FOR ALMOST 75% OF THE TOTAL TELECOMMUNICATIONS EQUIPMENT EXPENDITURES. RECORD AND DATA SERVICES ACCOUNT FOR 16%.

AT&T IS THE LARGEST SUPPLIER OF TELECOMMUNICATIONS EQUIPMENT WITH A SHARE OF 21% OF THE TOP 22 SUPPLIERS COMBINED REVENUES. NORTHERN TELECOM'S SHARE IS 7.5% WITH REVENUES OF ABOUT $4 BILLION IN 1985. WE HAVE NO EQUIVALENT TO NORTHERN TELECOM IN THE INFORMATION FIELD.



* The Canadian information processing industry market is expected to grow from $7.2 Billion in 1985 to $11.6 Billion by 1991 for an average annual growth rate of 11% (same as A.D. Little's estimate for the world market)

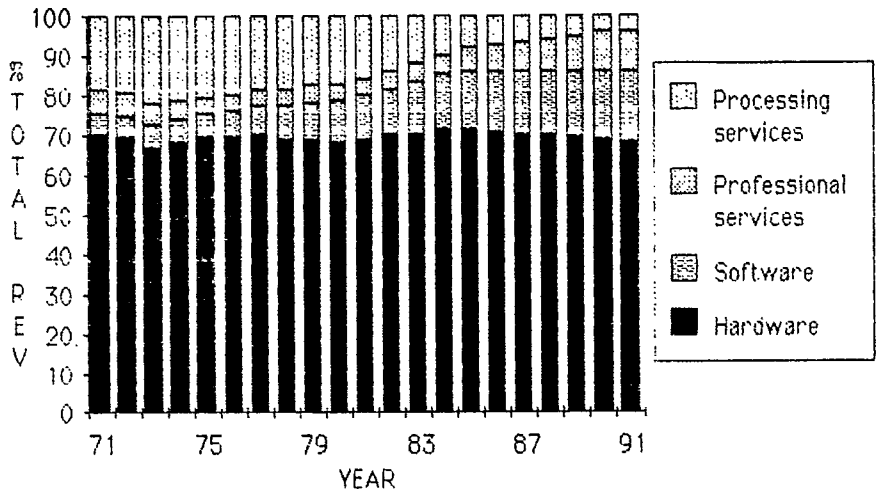
* Revenues derived from the sales of hardware will grow from approximately $5 Billion in 1985 to approximately $8 Billion by 1991 for an average annual growth rate of about 8%

* Revenues derived from software will grow from about $1 Billion in 1985 to about $2 Billion in1991 for an average annual growth rate of 12%

* The revenues from processing services (a Canadian strength) will actually decline from $620 Million to $475 Million in 1991.

CANADIAN INFORMATION PROCESSING INDUSTRY

$7.2 BILLION 1985 (Exc Exports)



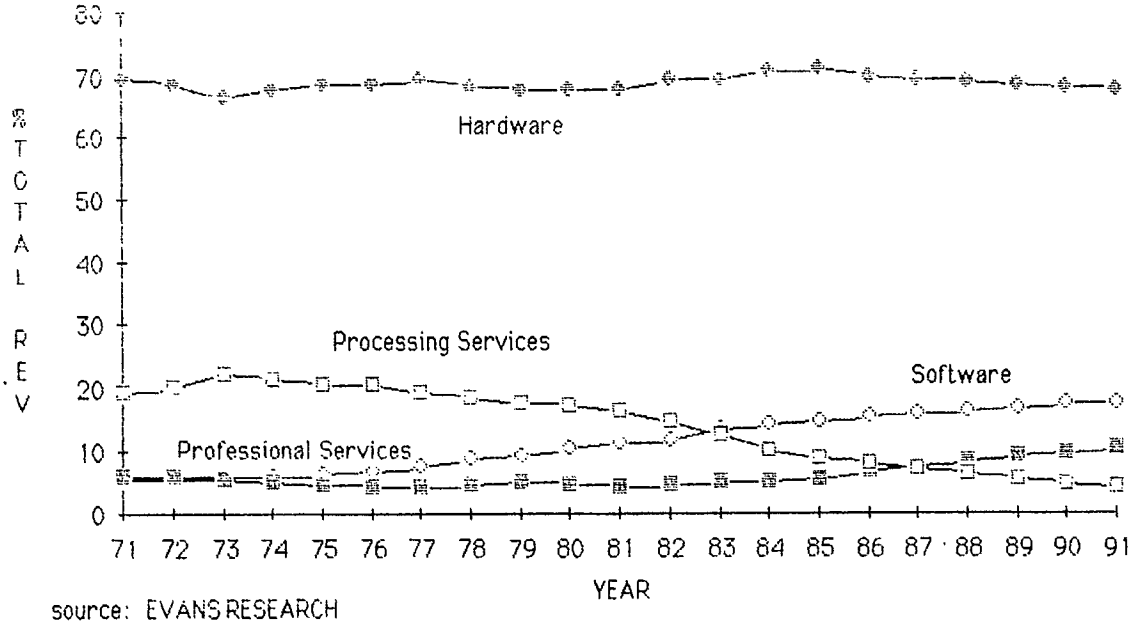
source: EVANS RESEARCH

* In terms of revenues generated, hardware products dominate the market place. Hardware accounted for 70% of total revenues in 1971. This share is expected to stay pretty much at the same value 68% by 1991.

* The share of software has been rising from 5% in 1971 to 14% in 1985 and is expected to continue to rise to 17% by 1991. Part of this increase is due to unbundling of software prices in the the '70s and the other part is at the expense of processing services whose share has declined from 19% in 1971 to 8.6% in 1985 and is expected to further decline to 4% by 1991. Rather than developing software for every new application people have been buying more and more off-the-shelf packages.

CANADIAN INFORMATION PROCESSING INDUSTRY

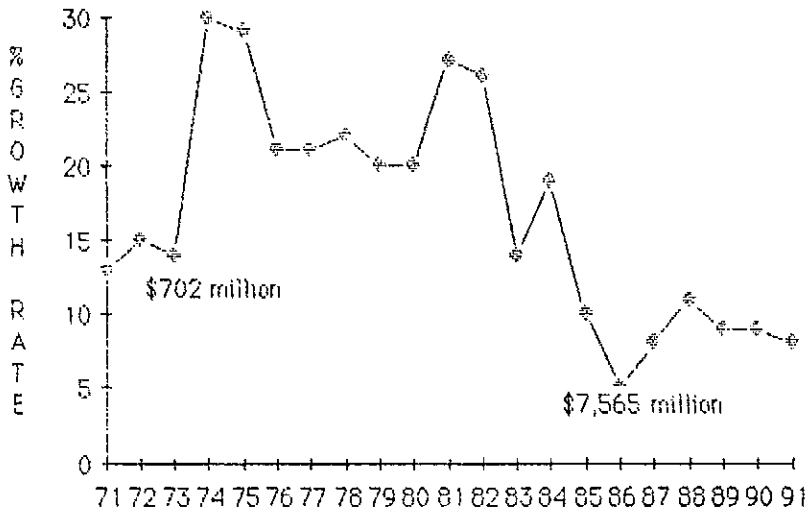
$7.2 BILLION 1985 (Exc Exports)



source: EVANS RESEARCH

CANADIAN INFORMATION PROCESSING INDUSTRY

Year to Year Growth Rate (excludes exports)

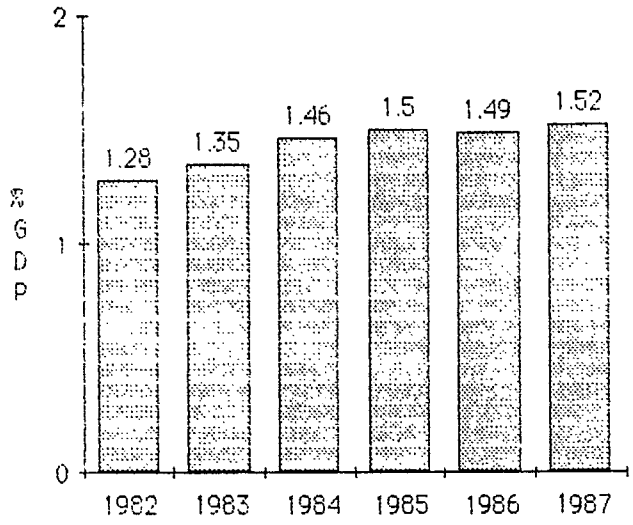


source: EVANS RESEARCH

* The real growth rate of the Canadian Information Processing Industry has declined from 15% to 30% in the '60s and '70s to 8% over the last 3 years. This is to be expected as the industry is maturing. The growth rates are always high for any new industry.

CANADIAN INFORMATION PROCESSING INDUSTRY AS A % OF GDP

(Excluding Exports)



GDP $ MILLIONS

1982: 374,750

1983: 405,425

1984: 443,327

1985: 476,361

1986: 505,227

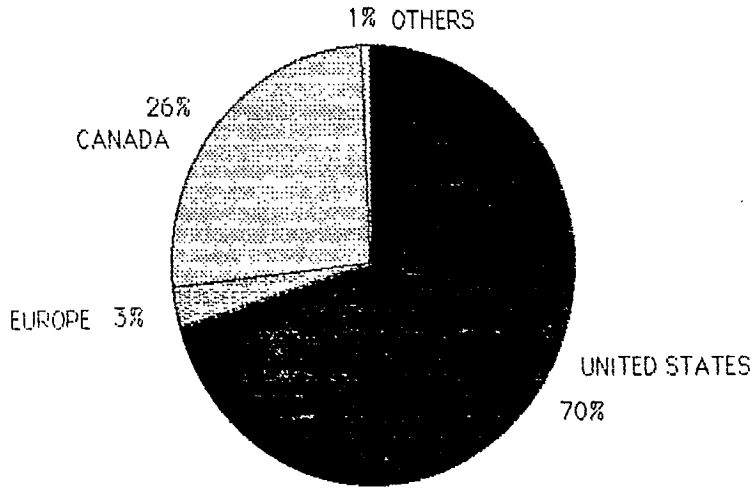
1987: 539,400

source: EVANS RESEARCH

* The maturing of the Canadian Information Processing Industry is also evident if we look at its percentage share of the GDP. It seems to be stabilizing at approximately 1.5%.

1985 COMPUTER COMPANY OWNERSHIP IN CANADA

1985 REVENUE $9.025 BILLION (Top 200 Co's)

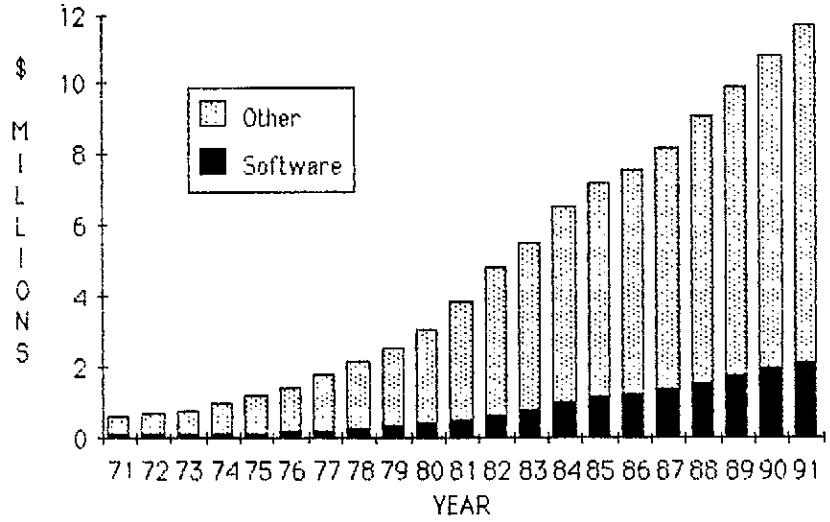


source: EVANS RESEARCH

* Of the total 1985 revenues of $9 Billion (including exports), Canadian companies accounted for 26% while U. S. companies accounted for 70%

SOFTWARE AS SHARE OF TOTAL INDUSTRY REVENUE

CANADIAN $ MILLIONS (Excludes Exports)

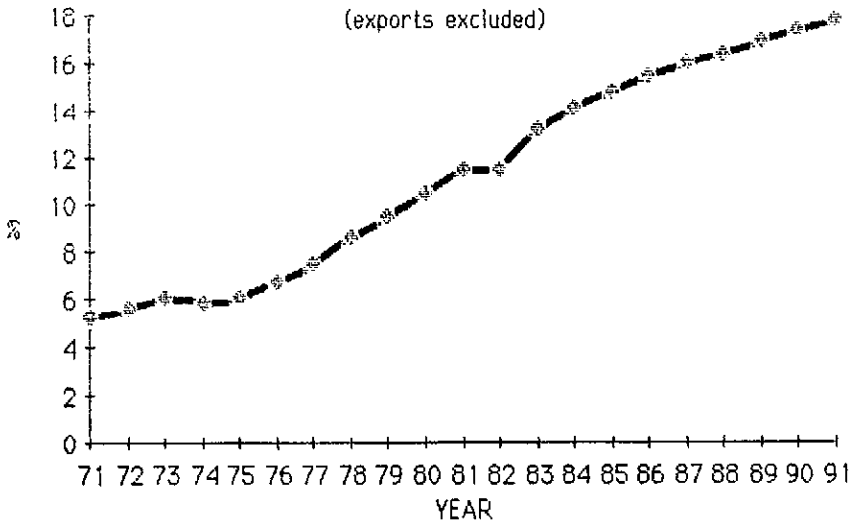


* Software as a percentage of total information processing revenues has been increasing steadily from 5% in 1971 to 15% in 1985 and is expected to increase further to 18% in 1991.

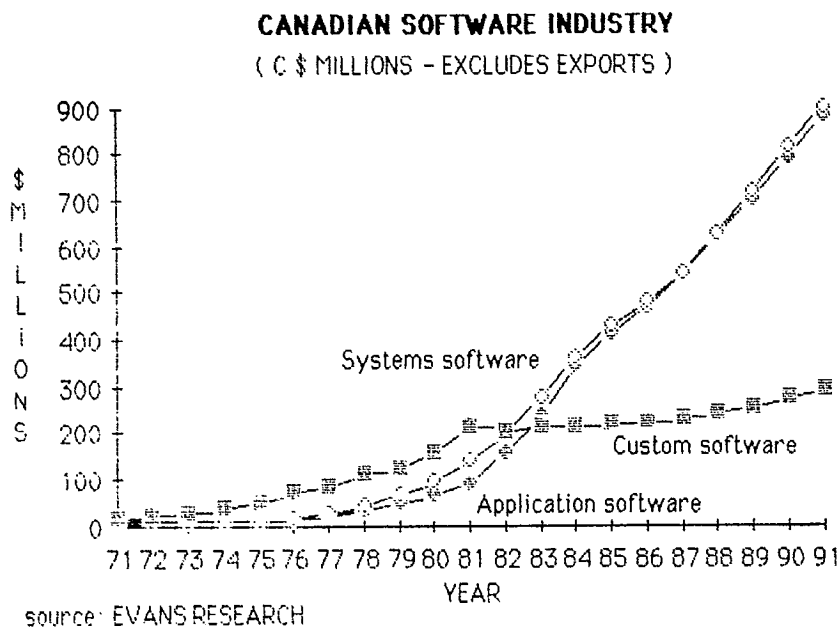
SOFTWARE REVENUE AS A % OF INFORMATION PROCESSING

TOTAL IP REVENUE 1985 $7.2 BILLION

(exports excluded)



source: EVANS RESEARCH



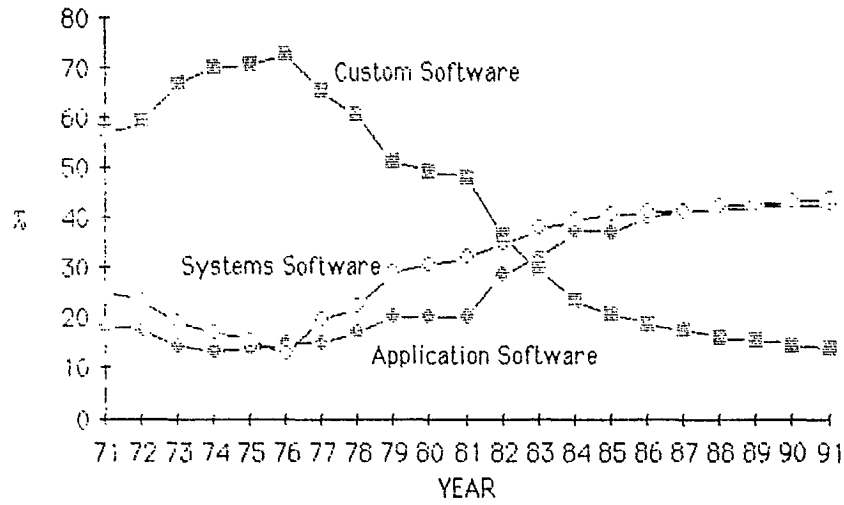
* Application (off-the-shelf) software revenues increased from $5 Million in 1971 to $450 Million in 1985 for an average annual growth rate of 37% . It is expected to further increase to $880 Million by 1991 for a growth rate of 12% between 1985 and 1991. This area is mainly dominated by U.S. owned companies.

* The systems software revenues increased from $7 Million in 1971 to $430 Million in 1985 for an average annual increase of 37%. It is expected to increase to $900 Million by 1991 for a growth rate of 13% between 1985 and 1990. This area is dominated by U.S. hardware companies like IBM, DEC, and UNISYS.

* The third type of software is custom developed software. Custom software grew from $16 Million in1971 to $210 Million in 1981 for an average annual growth rate of 29%. These revenues have grown very little since then from $210 Million in 1981 to $220 Million in1985. These are expected to increase to $290 Million by 1991 for a growth rate of 5%. This area is dominated by Canadian owned firms and unfortunately is projected to be the least growth area.

CANADIAN SOFTWARE INDUSTRY REVENUE

PERCENTAGE OF TOTAL SOFTWARE REVENUE



source: EVANS RESEARCH

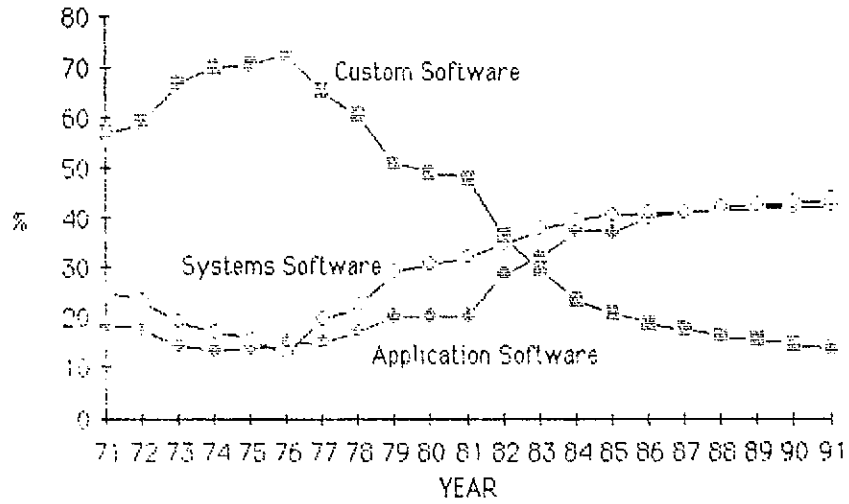
* In terms of percentage of total software revenues application software revenue increased from 18% in 1971 to 39% in 1985 and is expected to further increase to 43% by 1991.

* Systems software revenue increased from ~~57%~~ 25 in 1971 to ~~21%~~ 40 in 1985 and is expected to ~~decrease~~ increase further to ~~14%~~ 43% by 1991.

* Custom developed software decreased from 57% in 1971 to 21% in 1985 and is expected to decrease further to 14% by 1991.

CANADIAN SOFTWARE INDUSTRY REVENUE

PERCENTAGE OF TOTAL SOFTWARE REVENUE



source: EVANS RESEARCH

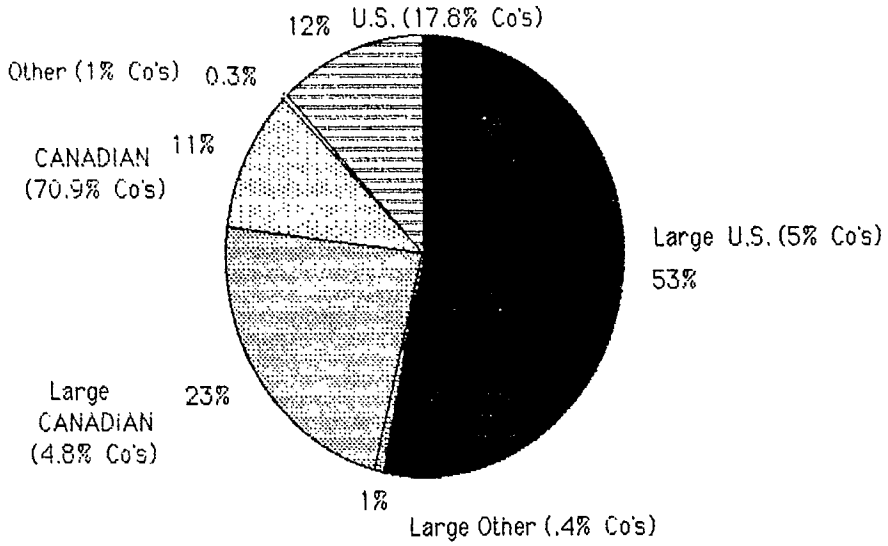
* In terms of percentage of total software revenues application software revenue increased from 18% in 1971 to 39% in 1985 and is expected to further increase to 43% by 1991.

* Systems software revenue increased from 25%in 1971 to 40% in 1985 and is expected to increasefurther to 43% by 1991.

* Custom developed software decreased from 57% in 1971 to 21% in 1985 and is expected to decrease further to 14% by 1991.

CANADIAN SOFTWARE REVENUE BY COMPANY

1981 - 516 Co's, $475 million (inc export)



source: EVANS RESEARCH

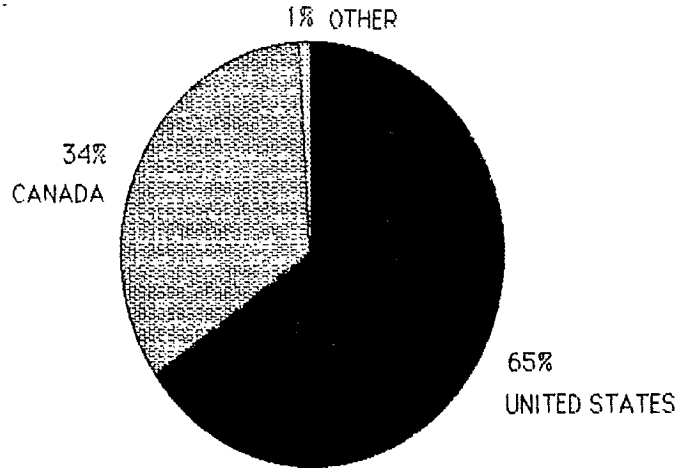
* Of the total 516 companies selling software in 1981, 53 companies (9%) derived revenues of $1 Million or more and accounted for 77% of the total software revenues.

* The remaining 463 companies (91%) accounted for only 23% of total revenue.

* Of the 516 companies 391 (75%) were Canadian and accounted for 34% of the total revenue.

CANADIAN SOFTWARE REVENUE BY COMPANY

1981 $475 MILLION (including Export)



source: EVANS RESEARCH

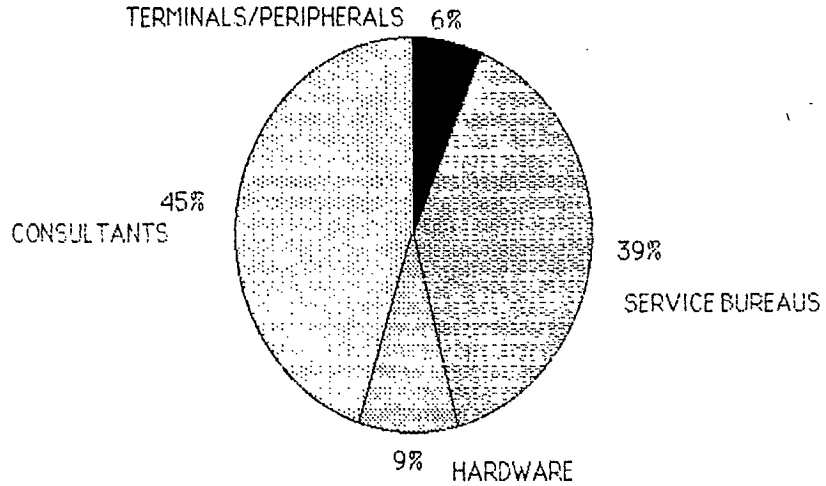
* In 1981 (the latest year for which figures are available) the U.S. owned companies like IBM, DEC, etc. accounted for 65% of the total software revenues.

* Canadian owned companies accounted for 34% of the total revenues.

* The custom developed software represented 48% of the total software revenues in 1981 and represented only 29% in 1986. This area is controlled by the Canadian owned companies.

CANADIAN SOFTWARE REVENUE BY CANADIAN CO'S

$140 MILLION (Inc Export 1981) 25 Co's

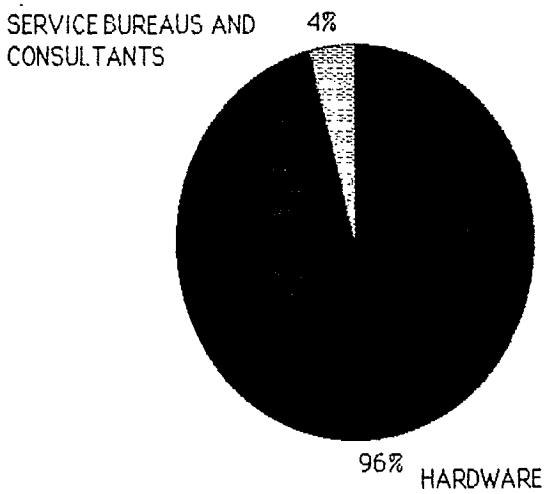


source. EVANS RESEARCH

* Unlike the American companies, of the total software revenues derived by the Canadian companies, 85% is derived by service bureaus and professional consultants.

CANADIAN SOFTWARE REVENUE BY U.S. COMPANIES

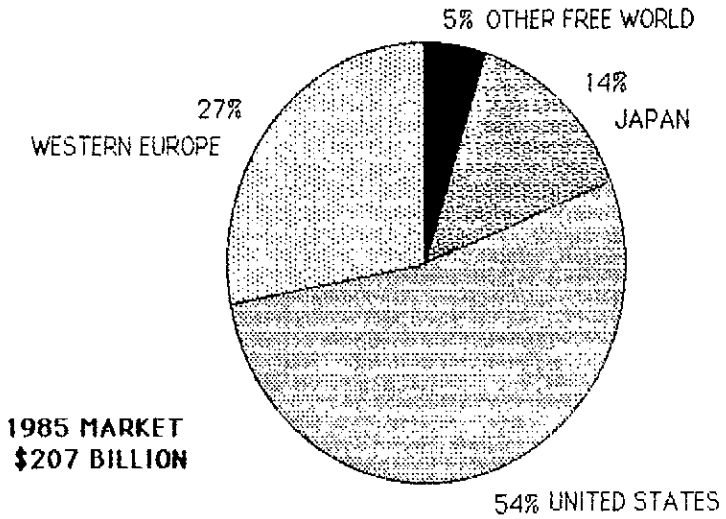
$254 MILLION (including Export 1981) 26 Co's



source: EVANS RESEARCH

* It is mainly the U.S. hardware companies which account for the U.S. share of the software revenues from the Canadian market. Of the 26 U.S. companies receiving $1 Million or more in software revenues from the Canadian market, hardware companies account for 96% of the the total revenue for this group.

INFORMATION PROCESSING PRODUCTS
WORLD MARKETS BY REGION



1985 MARKET
$207 BILLION

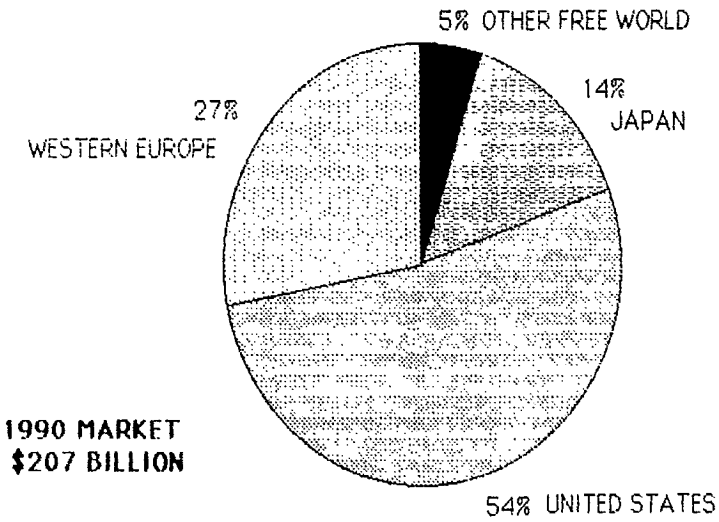
source: ARTHUR D. LITTLE

* The word market for information processing products was $127 Billion in 1985 and is expected to grow to $325 Billion by 1995 for an average annual growth rate of 11%.

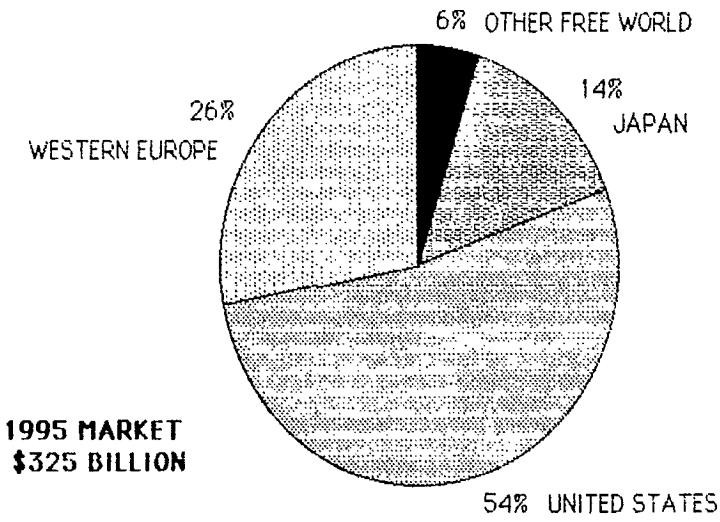
* The U.S. accounts for over half of this market (53%) and is expected to stay that way over the next 10 years.

* Japan's share is much smaller at 14% and Western Europe is at 28%. Thses shares are also not expected to change much over the next 10 years.

* The Canadian market was worth $7.4 Billion in 1985 which is 11% of the U.S. market. This estimate is according to Evans Research (A.D. Little's estimate of the Canadian market is not as reliable).

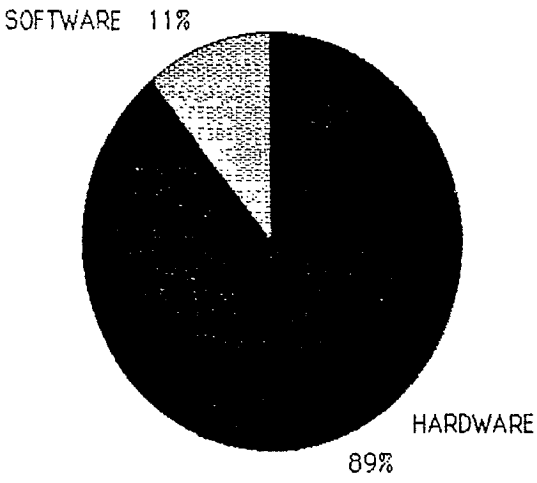


INFORMATION PROCESSING PRODUCTS
WORLD MARKETS BY REGION



source: ARTHUR D LITTLE

INFORMATION PROCESSING PRODUCTS
WORLD MARKETS
1985 TOTAL MARKET $126.9 BILLION



source. ARTHUR D. LITTLE

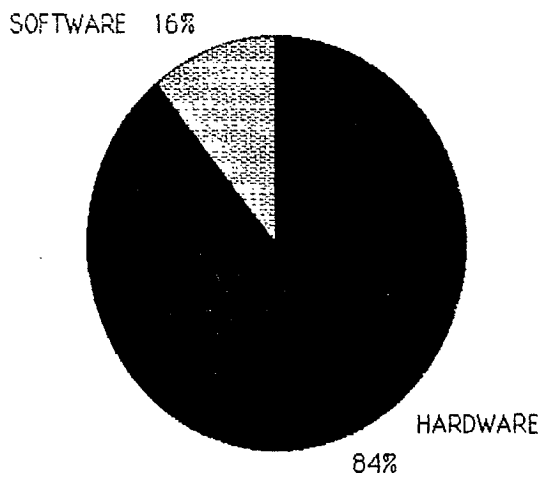
A.D. LITTLE SEES -

* Software as a growth area. Software's share of the total information processing market is expected to grow from 11% in 1985 to 22% in 1995

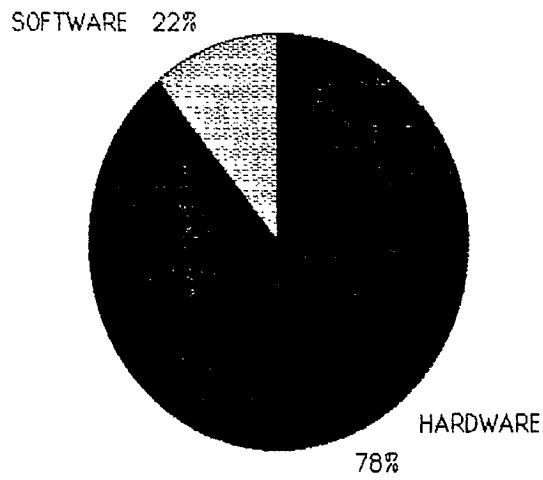
* In terms of actual size, hardware accounts for 89% of the market in 1985 and is expected to still dominate the market even in 1995 with a market share of 78%

* According to the latest forecast (April 1987) by Evan's Research, the share of software for the Canadian market was 15% in 1985 and is expected to grow to a share of 17% by 1991
(Evan's had predicted a share of 20% by 1990 in 1986)

1990 TOTAL MARKET $207.5 BILLION

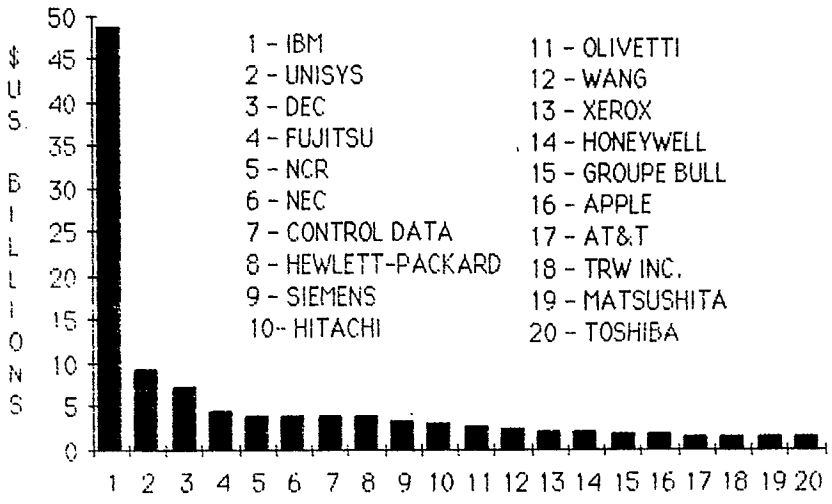


INFORMATION PROCESSING PRODUCTS
WORLD MARKETS
1995 TOTAL MARKET $325 BILLION



source. ARTHUR D LITTLE

TOP TWENTY EDP COMPANIES
TOTAL $108.9 BILLION U.S.

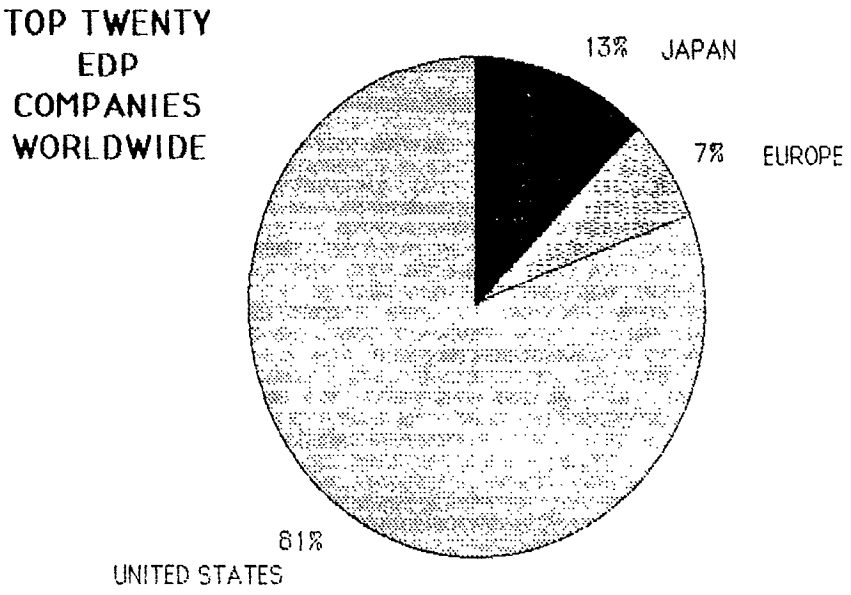


source: EVANS RESEARCH

* The top twenty EDP companies derived revenues of approximately $110 Billion in 1985

* IBM alone accounted for 45% of the total revenues for this group. Its closest competitor was UNISYS (which was formed by merging BROUGHS and SPERRY) received 8.6% of the total revenues

source: EVANS RESEARCH and DATAMATION



source: EVANS RESEARCH

* The U.S. companies account for 81% of the total revenues for this group.

* The Japanese companies account for 12.6% and the European companies account for 6.6%.

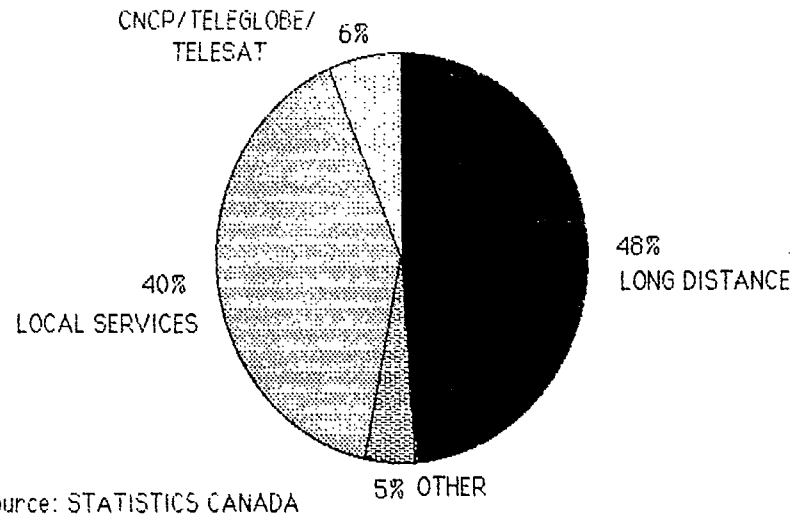
* IBM's share alone (45%) is more than twice that of the Japanese and European companies combined.

* The U.S companies dominate the information technology field.

* The fear of Japanese domination of the information field (through its fifth generation project) appears over exaggerated.

TELECOMMUNICATIONS SERVICES REVENUES

1982 TOTAL REVENUES $6.4 BILLION



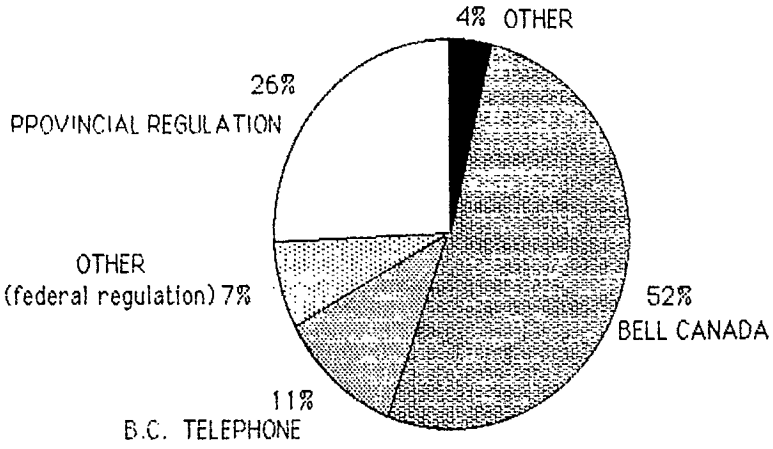
source: STATISTICS CANADA
CAT. 56-203, 56-201

* Total telecommunication service revenues grew from $2.3 billion in 1973 to $8.4 Billion in 1982 for a healthy growth rate of 15%. The total computer industry revenues from the Canadian market in 1982 was about $5 Billion.

* Long distance revenues accounted for almost half the total revenues 49%. Local calss accounted for 40%.

* CNCP, TELEGLOBE AND TELESAT accounted for 6% of the total revenues.

TELEPHONE & TELECOMMUNICATIONS CARRIERS
1985 TOTAL REVENUE $11 BILLION

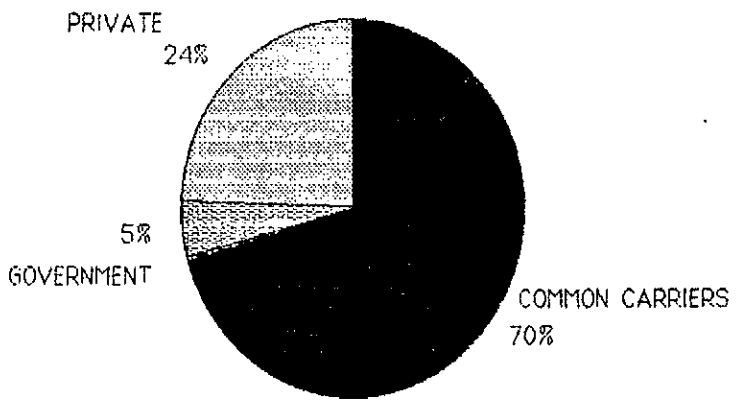


source: COMPANY ANNUAL REPORTS/DOC

* The telephone and telecommunication carriers which includes Bell Canada, BC TEL, TELESAT, TELEGLOBE, CNCP, Alberta Government Telephones and other such companies had total revenues of $11 Billion in 1985. The total revenues of information processing companies from the Canadian market (excluding exports) were $7.2 Billion. In the case of computers for every dollar spent 40 cents went to in-house personel. Considering this, the total cost of computer use in 1985 was approximately $12 Billion, almost equal to telecommunications expenditures.

* Bell Canada accounted for over half revenues (52%) and BC TEL accounted for 11%. Provincially regulated companies received 25.6%.

NORTH AMERICAN EXPENDITURES FOR TELECOMMUNICATIONS
1986 BUYER' S MARKET

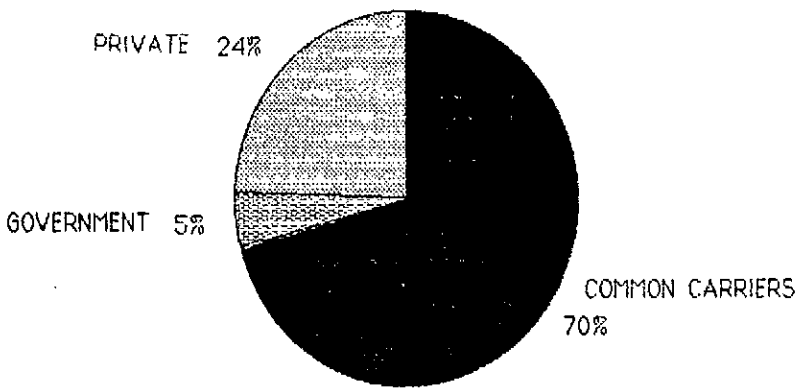


TOTAL MARKET
$35.76 BILLION

* The total North American expenditures on telecommunications equipment are expected to increase from $36 Billion in 1986 to $54 Billion in 1992 for a growth rate of 7%.

* Common carriers are the major clients for telecommunications equipment accounting for 70% of all expenditures.

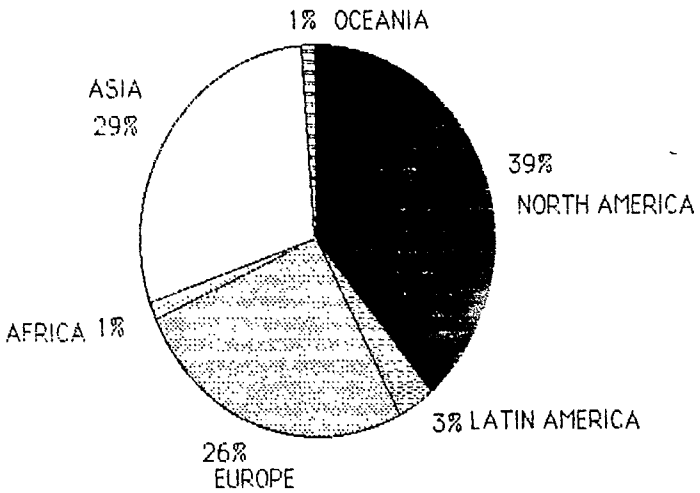
1992 BUYER'S MARKET



TOTAL MARKET
$53.87 BILLION

source: ARTHUR D. LITTLE

WORLD EXPENDITURES FOR TELECOMMUNICATIONS EQUIPMENT
1986 REGIONAL MARKETS

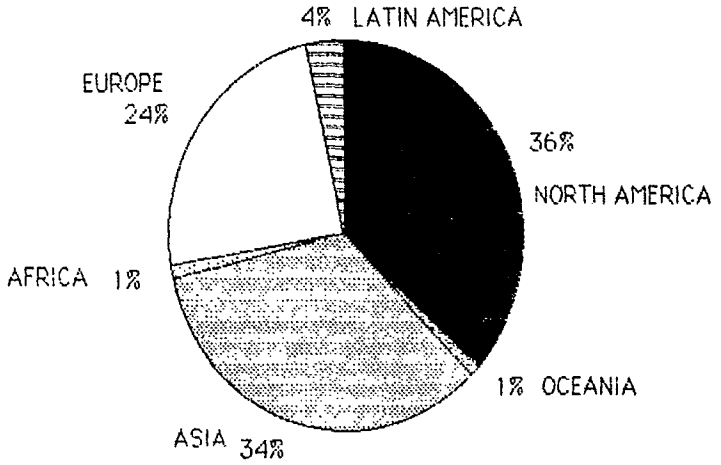


TOTAL MARKET $91 BILLION

* The total world market for telecommunications equipment is expected to increase from $91 Billion in 1986 to $147 Billion in 1992 for an average annual growth rate of 8.3%. The North American market's share will decrease slightly from 39.2% in 1986 to 36.6% in 1992.

* The share of the North American market for telecommunication equipment (39%) is smaller than its share for information processing products (53%). Inclusion of the USSR in the telecommunications market will make some difference. The major reason is probably the fact that telecommunications is a much more mature technology compared to information technology and North America is usually the leading user of new technologies, at least with information technologies.

1992 REGIONAL MARKETS



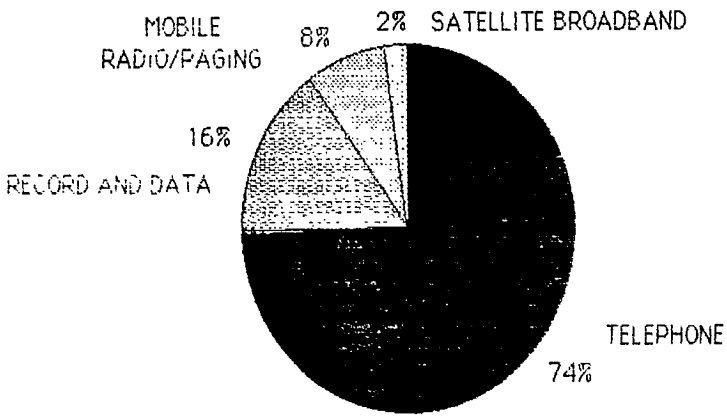
source: ARTHUR D. LITTLE

PROJECTED TOTAL MARKET $147

*The Canadian market is estimated by A. D. Little at approximately one tenth (1/10) of the U.S. market .

WORLD EXPENDITURES FOR TELECOMMUNICATIONS EQUIPMENT SYSTEMS MARKET

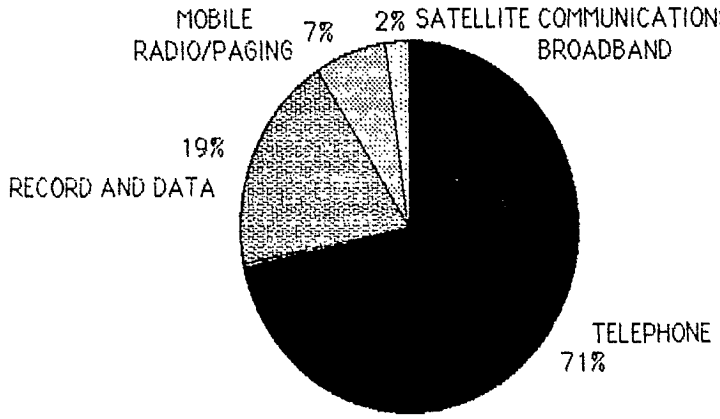
1986 TOTAL MARKET $147 BILLION



* Telephone systems accounted for 74% of the total telecommunications expenditures in 1986. Record and data communication systems accounted for 16%.

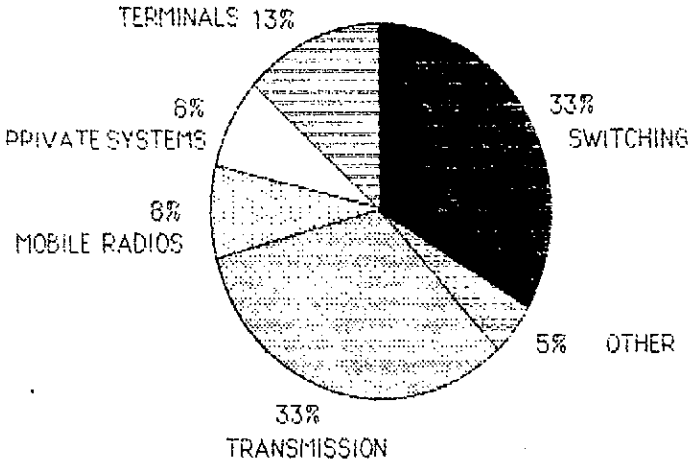
* The share of telephone equipment is expected to change slightly from 74% in 1986 to 72% in 1992. The share of record and data is expected to increase from 16% in 1986 to 19% in 1992.

PROJECTED 1992 TOTAL MARKET $ 147 BILLION



source: ARTHUR D. LITTLE

PRODUCT LINE SHARES OF WORLD SALES



source: OECD 1982

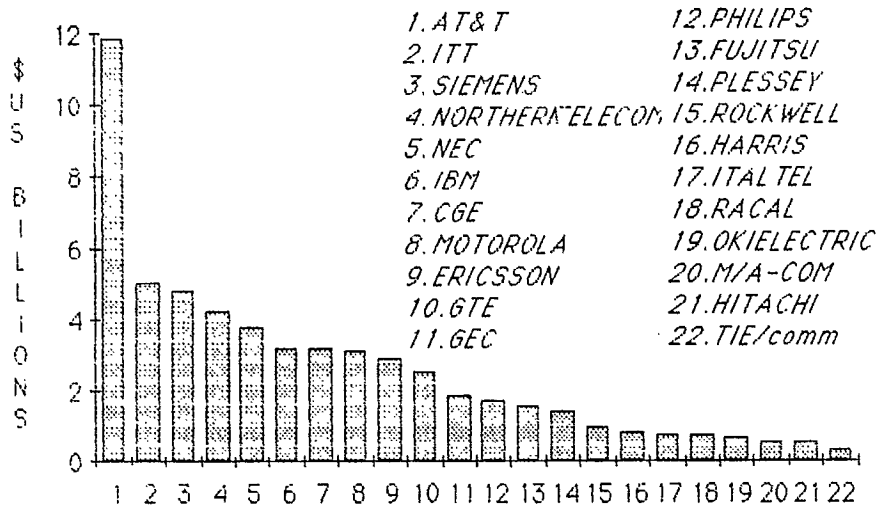
* Switching equipment (central office, PBX, data switches) accounted for 33% of all money spent on buying telecommunications equipment.

* Transmission (microwave, radio, cable, copper wire, satellite and fiber) also accounted for 33% of world sales .

* The remaining 33% was accounted for by terminal equipment (telephone sets, modems, data communications terminals, teletypwriters, private systems, and mobile radios).

source: OECD 1982

MAJOR TELECOMMUNICATIONS EQUIPMENT MANUFACTURERS
TOTAL 1985 SALES $56 BILLION



source. ARTHUR D. LITTLE

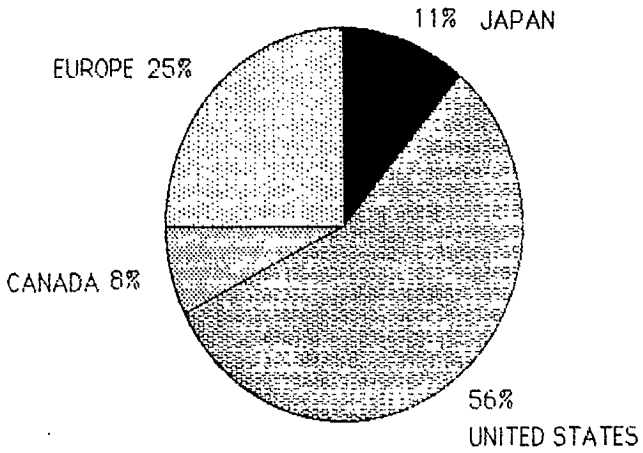
* There were 22 major manufacturers of telecommunications equipment with revenues greater than $ 300 Million in 1985.

* Their combined revenues in 1985 were approximately $ 56.6 Billion.

* AT &T accounted for one fifth of the total revenues (21%). ITT was the next largest supplier witn a share of 10%.

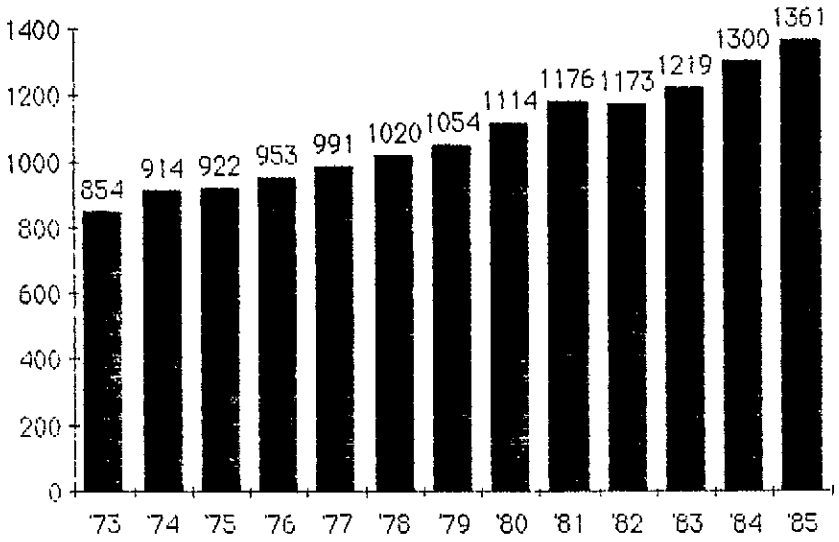
* Northern Telecom received a share of 7.5%.

TELECOMMUNICATION EQUIPMENT MANUFACTURERS BY REGION
1985 REVENUE $56 BILLION



source: ARTHUR D. LITTLE

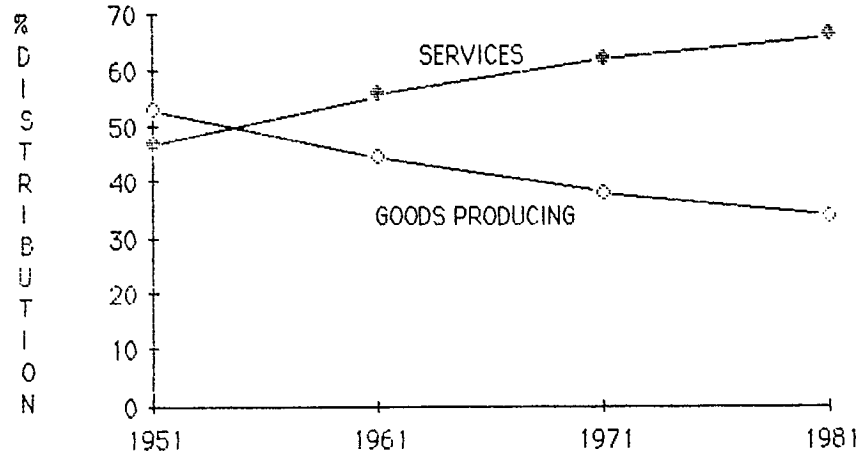
CANADIAN TELEPHONE CALLS PER CAPITA



source: STATISTICS CANADA

* Telephone calls per capita have increased from 854 in 1973 to 1361 in 1985 for an increase of almost 60%.

LABOUR FORCE BY SECTOR



source: STATISTICS CANADA

* The share of the labour force in the service sector has been increasing since the second world war. It went from 47% in 1951 to 66% in 1981.

* The share of the labour force in the goods producing sector decreased from 53% in 1951 to 34% in 1981.

source: Statistics Canada -Canadian Social Trends Spring '87

SERVICE SECTOR

COMMERCIAL SERVICES

DISTRIBUTIVE SERVICES
-Transportation and storage
-Communications
-Wholesale and retail trade

CONSUMER SERVICES
-Accomodation and food services
-Personal services (barber, dry cleaner)
-Amusement and recreational services
-other miscellaneous services

PRODUCER SERVICES
-Services to business management;
  -accounting
  -engineering
  -legal
  -management and consulting
-Finance, insurance and real estate

NON-COMMERCIAL SERVICES
-Education
-Health and welfare
-Religious organizations
-Public administration (government)

GOODS PRODUCING SECTOR

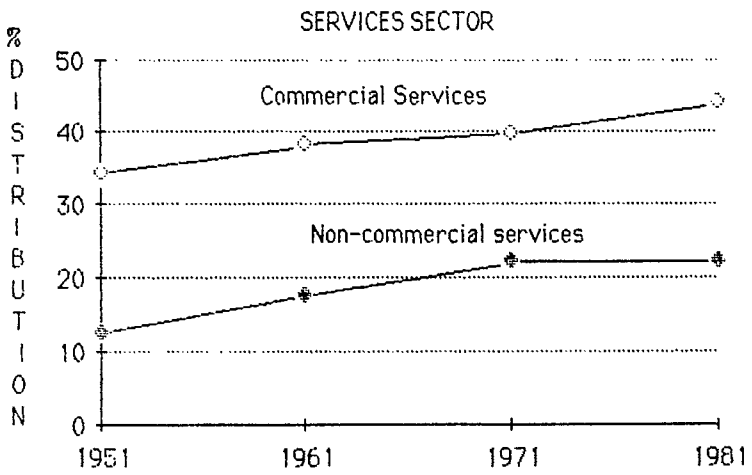
AGRICULTURE

MANUFACTURING

CONSTRUCTION

OTHER GOODS PRODUCING

CANADIAN LABOUR FORCE

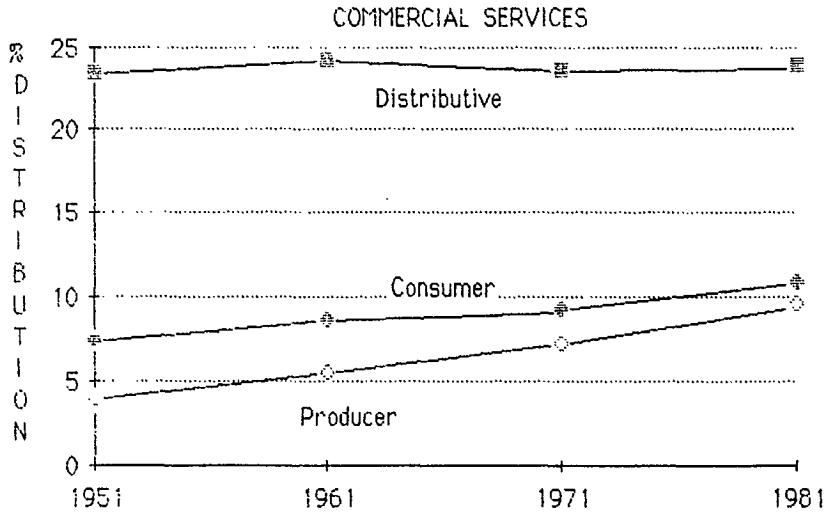


source. STATISTICS CANADA - CANADIAN SOCIAL INDICATORS

* The non-commercial sector (health, education and government) accounted for much of the growth in the service sector during the 1950s and '60s.

* However it was the strength of the commercial services that was responsible for the services sector's rising share of the labour force during the 1971-81 period. The share of non-commercial service stayed exactly at 22.1% between 1971 and 1981. In fact between 1971 and 1981 the education sector declined from 7% to 6.6%, the federal government's share declined from 4% to 3%. These increases were offset by increases in the health sector.

CANADIAN LABOUR FORCE



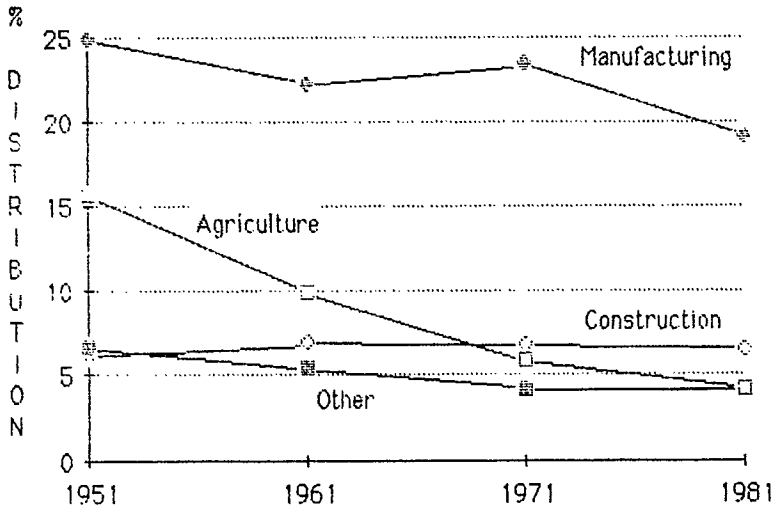
source: STATISTICS CANADA - CANADIAN SOCIAL INDICATORS

* The share of distributive services which includes transportation, communications, wholesale and retail trade remained constant at about 24% from 1951 to 1981.

* The share of consumer services industries which includes accomodation and food services, personal services(barbers, dry cleaners) and amusement and recreational services increased steadily from 7% in 1951 to 11% in 1981

* The producer services consisting largely of professional services - legal, accounting, engineering and management consultants, finance, insurance and real estate organizations - have consistently been the largest growing area, therby increasing their share from 4% in 1951 to 10% in 1981.

CANADIAN LABOUR FORCE
GOODS PRODUCING SECTOR



source: STATISTICS CANADA - CANADIAN SOCIAL INDICATORS

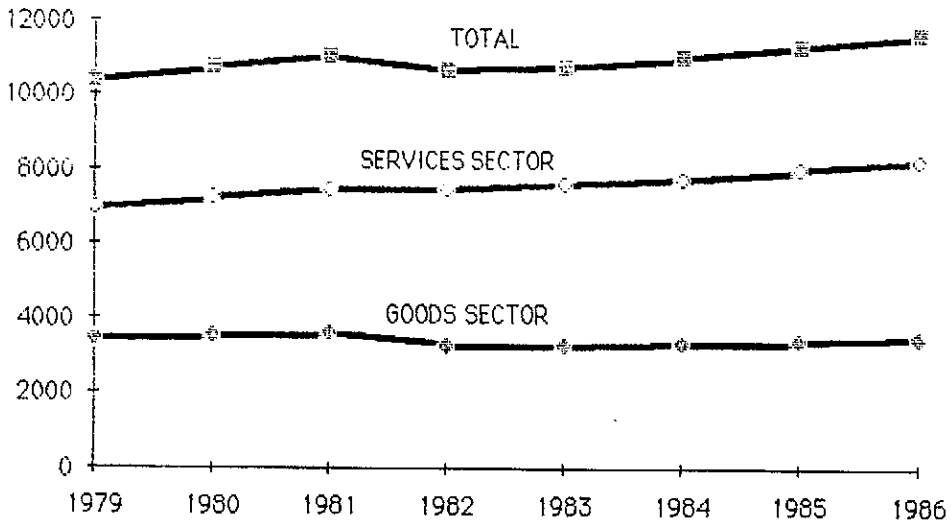
* Within the goods producing sector agriculture and manufacturing were characterized by particularly large decreases in their share of the total labour force.

* In 1981 just 4% of the labour force was involved in agriculture down from 16% in 1951. The agriculture labour force fell from 829,000 worker in 1951 to 493,000 in 1981.

* Manufacturing's share of the total labour force declined from 25% in 1951 to 19% in1981 eventhough the actual manufacturing labour force continued to grow over this period.

CANADIAN LABOUR FORCE

TOTAL EMPLOYMENT



source: STATISTICS CANADA - CANADIAN SOCIAL INDICATORS