THE BENELUX
COMPUTER SERVICES MARKET

INPUT EUROPE

ABOUT INPUT

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INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing ind ustries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services

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COMPUTER SERVICES MARKET

MARKET REPORT # 2

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INPUT

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I. INTRODUCTION

I. INTRODUCTION

- The Benelux countries represent a small segment of Western Europe which is of interest to many foreign companies and organisations. This interest is out of proportion to their size as countries. Together they contain some 9% of the population of the nine countries in the EEC and account for approximately 11% of its G.N.P.

- The two main Benelux countries, Belgium and Holland are two of the most densely populated areas in the world. This congestion has contributed historically to the dynamism of their peoples, and this in turn has led to and continues to accentuate their commercial and political importance at the centre of European affairs.

- To readers of INPUT reports, their importance is linked to this background and to their strategic position in the cultural and commercial heartland of Europe, because it results in:

  - good communications and transportation,
  - ready access to the major European countries,
  - close contact with major international organisations and many important multi-national corporations,
  - the open-minded attitudes to business on the part of the national business communities.

- The objectives of this report are:

  - to describe the current state and the prospects for the computer services industries in these countries,

- to highlight specific areas of difference between these and other European countries, as markets for computer services,
- to outline the advantages to be gained by being based in one or other of the Benelux countries.

- The report has drawn on previous experience in consulting work in these countries, as well as on Government statistics kindly supplied by the national governments of Belgium, Holland and Luxembourg. Where other outside sources have been used, the fact is normally recorded on the Exhibits which have been derived from them.

- INPUT has already concluded assignments for major U.S. services vendors wishing to establish an entry point into Europe, or to make an acquisition in one of the Benelux countries.

- The present report forms part of the European Market Analysis Service (MAS/EUROPE).

- Comments and enquiries from clients on the information presented in this report are invited and welcomed.

II. EXECUTIVE SUMMARY

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A. THE BENELUX COMPUTER SERVICES MARKET (1978)

- The total Computer Services market for the Benelux countries in 1978 amounted to $526M at 1978 dollar exchange rates.

- During the year the markets for Computer Services in the three Benelux countries continued to grow, showing an overall growth over 1977 revenues of 45%. This very healthy looking figure should be regarded in the light of current European inflation rates and the recent steady fall in the international value of the dollar.

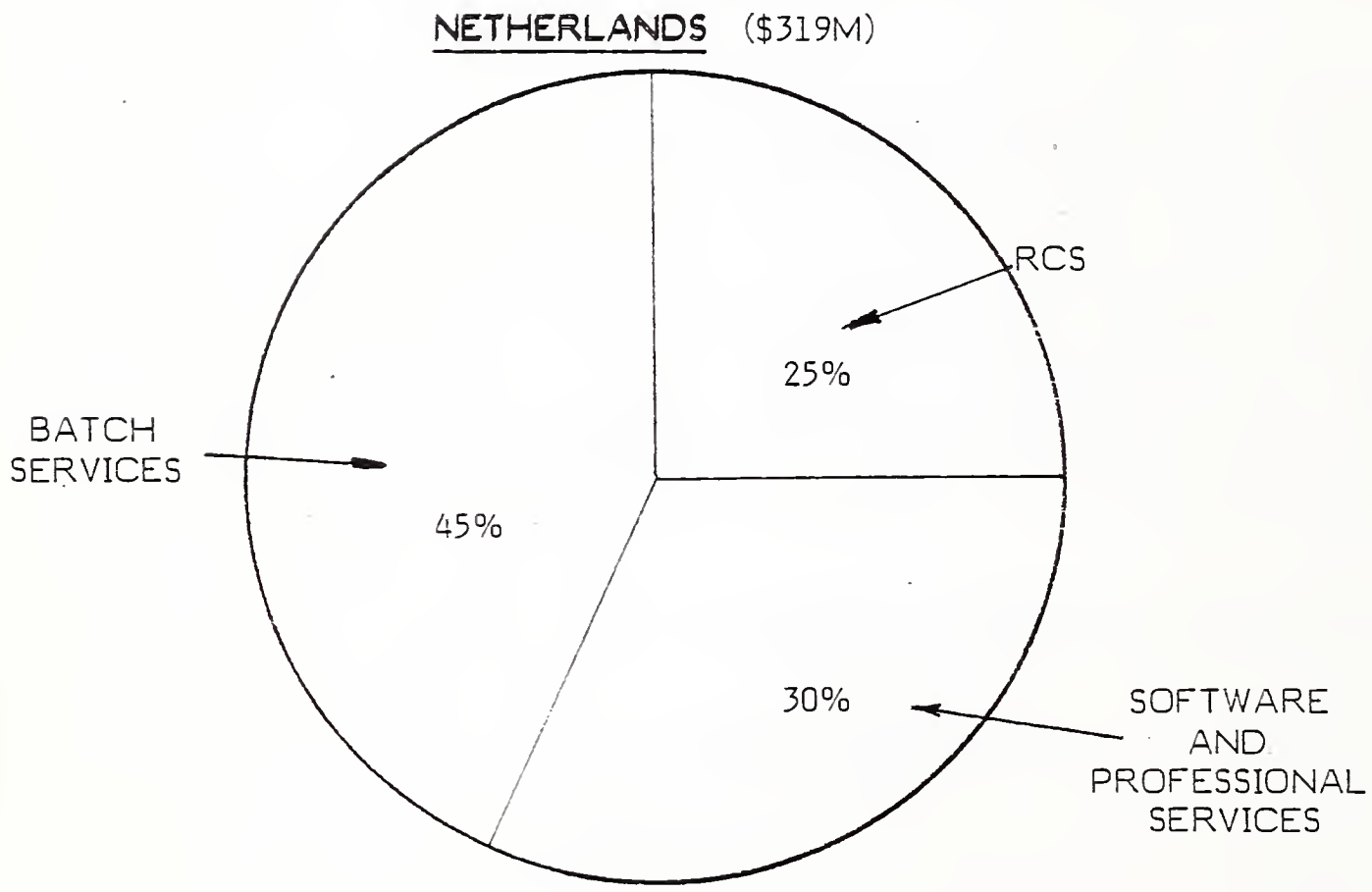
- The annual growth rate of 45% is accounted for by:

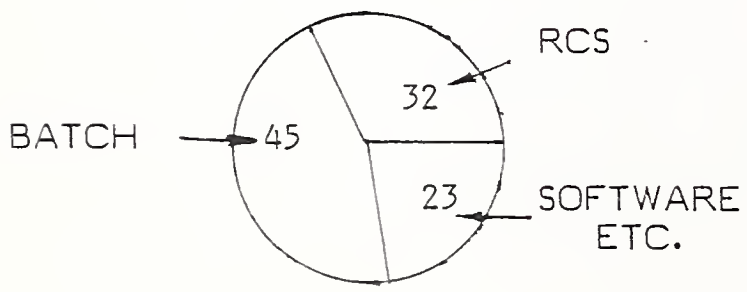
  - 9% - average fall in the dollar,
  - 6% - average domestic price rises for equivalent products,
  - 26% - true growth in terms of new business or additional business from existing accounts.

- Exhibit II-1 illustrates the breakdown of the total 1978 market value of $526M, between the three constituent nations:

  - Netherlands - $319M or 61%, of market share,
  - Belgium - $201M or 38%,
  - Luxembourg - $ 6M or 1%.

BENELUX COMPUTER SERVICES MARKET 1978





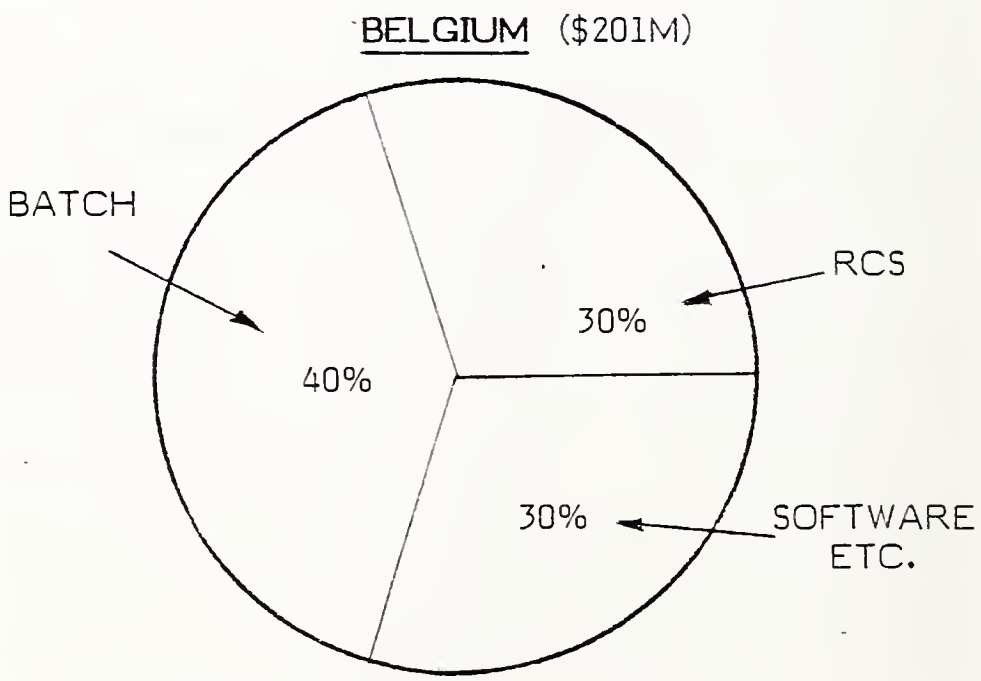


EXHIBIT II-1

- Belgium experienced a higher growth rate (58%) than Holland (38%), and thus to some degree closed the gap between them in the size of total country market. However, the Belgian growth rate also incorporates higher dollar depreciation and domestic inflation factors than the Dutch rate, as follows:

-	Belgium	. 10 %	-	dollar depreciation,
		. 8 %	-	domestic inflation,
		. 33 %	-	business growth,
-	Holland	. 8½%	-	dollar depreciation,
		. 4½%	-	inflation,
		. 22 %	-	growth.

- Therefore the Belgium market has grown at a 50% greater rate than the Dutch market in terms of new and additional business acquired.

- Luxembourg at 1% of the overall total does not have a significant impact on the market as a whole. The country, being linked in a monetary union with Belgium, tends to react in a similar way to that country; and for many purposes is best regarded as another "province" of the Belgian market.

- Exhibit II-2 shows the growth between 1977 and 1978 in terms of the different types of services sold in each country.

B. PROCESSING SERVICES

- Work completed in Batch mode, defined to include off-line Data Preparation and Encoding, remained as the single largest revenue earning service in all three Benelux countries, ranging from 40% of revenues in Belgium to 45% in Holland and Luxembourg, giving an all-country average of 43%.

BENELUX COMPUTER SERVICES MARKET SIZES, 1977 AND 1978.

COUNTRY	SERVICE	1977		1978		GROWTH RATE %
		$M	%	$M	%	
HOLLAND	RCS PROCESSING	53	23	80	25	51
	BATCH	111	48	142	45	30
	S/W. PRODUCTS	10	4	17	5	70
	PROF. SERVICES	58	25	80	25	40
	ALL	232	100	319	100	38
BELGIUM	RCS PROCESSING	36	28	60	30	67
	BATCH	59	47	81	40	37
	S/W. PRODUCTS	5	4	8	4	60
	PROF. SERVICES	27	21	52	26	93
	ALL	127	100	201	100	58
LUXEMBOURG	RCS PROCESSING	1	25	2	32	92
	BATCH	2	50	3	45	35
	S/W. PRODUCTS	-	5	-	6	80
	PROF. SERVICES	1	20	1	17	27
	ALL	4	100	6	100	50
ALL	RCS PROCESSING	90	25	142	27	58
	BATCH	172	47	226	43	31
	S/W. PRODUCTS	15	4	25	5	67
	PROF. SERVICES	86	24	133	25	55
	ALL	363	100	526	100	45

SOURCE: CAMP/EUROPE AND INPUT ESTIMATES

EXHIBIT II-2

- Off-line Data Preparation undertaken by specialist non-processing bureaux typically accounts for 6-7% of the market, or between 14% and 16% of the Batch Services sector.

- Work completed in RCS (Remote Computing Services) mode, including Interactive and Remote Batch, was the second largest sector, both overall and in two countries - Belgium and Luxembourg -, whereas in Holland it tied for second place at 25%.

- In all countries Batch Services grew at a below market average rate, while RCS grew likewise at an above average rate. This relative decline of Batch is expected to continue and the rate of decrease is gentle enough to fit in with industry forecasts of a prolonged period of falling market share, rather than a sudden demise.

- The growth of RCS was greatest in the smallest, i.e. least-developed, country market, Luxembourg, at 92%, but was substantial in Belgium (67%) and Holland (51%).

- User Site Hardware Services are not included in the service type breakdown used in this report, because the volume of business done under this heading is still negligible in all European markets. Useful indications have, however, been detected in the Belgian market, where there is evidence of vendors offering this approach to decentralisation.

C. SOFTWARE PRODUCTS

- In European markets as a whole the revenues earned by the separate sale or licence of software products are small - of the order of 5% -, and the Benelux countries are no exception to this rule. Where income is earned, it is usually from one of:

  - system software products, (operating systems or language compilers),
  - utility programs and routines, including DBMS.

- Very little use is made of application system products, though many systems are produced as customised repeats of previous applications. These are usually sold as tailored-software systems and are therefore included in INPUT's analysis under the Professional Services heading. The reasons for this reluctance on the part of the users to adopt application products relate to the diversity of the West European market, and are discussed in detail in INPUT's earlier MAS/Europe report entitled "Application Software Development for Mini and Small Business Computers".

- The growth of software product sales is strong in Benelux, being lowest in Belgium at 60% growth between 1977 and 1978. The overall growth rate is 67% for the combined country market and the Software Products sector is thus the fastest growing component of computing services in the observed period, beating RCS Processing into second place at 58% by 9 percentage points. Such a high growth rate is not expected to continue at this level, but because of its relative lack of development the sector will lead the growth rate chart for the next two years.

D. PROFESSIONAL SERVICES

- This category is defined to include:

  - Consultancy, training and education,
  - Tailored systems and programming,
  - Contract programming,
  - Turnkey systems.

- At $133 million in 1978, this sector represents 25% of the overall Benelux market, up 1% from the 24% recorded in 1977. Like RCS and Software Products, it has a growing market; and this growth similarly is had at the expense of the Batch Services sector.

- Growth in absolute terms between 1977 and 1978 was up from $86 million, a 55% increase. Professional Services are expected to continue at this level of growth; any decrease in tailored systems market share being taken up by increases in:

  - consultancy, education and turnkey systems.

E. NATIONAL DIFFERENCES AMONG THE THREE MARKETS

- Exhibit II-3 shows a comparison table of the major European country markets' usage of computer services in 1978. The analysis was derived from mainly large user research on processing services. A breakdown is given under:

  - main processing mode categories - Batch, Remote Batch and Interactive,
  - the overall services total.

- Also shown are:

  - differences in user estimates of growth for external and in-house services,
  - the user sample's growth estimates (relating mainly to large users) and INPUT's estimates for the total user population.

- Growth estimates are all at constant 1978 values and for the market as a whole are healthy in most areas.

- The two major Benelux countries differ in market characteristics:

  - whereas Holland is a well-developed, competitive market, offering users a wide range of options from over 250 service companies,
  - Belgium is a more traditional market, tied, up to the present, very largely to the methods appropriate to large users.

COMPARISON OF MAJOR EUROPEAN COUNTRIES' SERVICES USAGE, 1978

		UK		France		Germany		Belgium/Lux		Holland		Swed/Nor	
SURVEY DETAIL													
Sample Percentage		49%		57%		38%		66%		40%		55%	
No. of Responses		703		783		398		347		163		249	
EXTERNAL SERVICES													
Usage	Overall	43%		41%		25%		33%		44%		72%	
	Batch	29%		30%		13%		23%		28%		53%	
	R. Batch	8%		5%		6%		3%		10%		23%	
	Interactive	16%		9%		11%		14%		20%		33%	
User Est'd Growth	Batch	-4%	(+17%)	-12%	(+20%)	+4%	(+18%)	+1%	(+18%)	-17%	(+14%)	-15/-6	(+15%)
	R. Batch	+4%	(+9%)	+13%	(+6%)	0%	(+14%)	+14%	(+12%)	-1%	(+10%)	+1/+29	(+10%)
	Interactive	+12%	(+25%)	+10%	(+24%)	+12%	(+15%)	-11%	(+24%)	+16%	(+25%)	+8/+32	(+25%)
	Combination	N/A	(N/A)	+18%	(N/A)	+10%	(N/A)	+1%	(N/A)	+31%	(N/A)	+23/+39	(N/A)
INTERNAL SERVICES													
In House Usage		73%		79%		90%		82%		67%		70%	
User Est'd Growth	Centralised	N/A		+21%		+17%		+11%		+21%		+10/+14	
	Distributed	N/A		+51%		+22%		+40%		+23%		+30/+32	
APPLICATION GROWTH													
1.		FA/P		GA/P		P/I		GA/P		P/I		P/I	
2.		P/I		FA/P		FA/P		FA/P		FA/P		FA/P	
3.		GA/P		P/I		M/S		P/I		M/S		M/S	

EXHIBIT II-3

*NOTE: User estimated growth applies to a sample containing large organisations and is not representative of the overall market trend; furthermore new users growth is not included. Overall market growth figures, as estimated by INPUT are given in parenthesis.

- Holland is starting to exhibit certain aspects of an established market:

  - large national vendor companies with substantial backing from local sources of finance,
  - deliberate acquisition strategies being adopted by both national and multinational vendors,
  - acceptance of minicomputer-based solutions.

- Belgium on the other hand is starting to break out of its traditional mould and beginning to experiment with:

  - distributed processing (DDP),
  - microprocessor-based User Site Hardware Services (USHS).

- Both countries are reacting to the principal driving force at present at work in the market, - the move towards decentralised computing - in accordance with these national characteristics:

  - large users in Holland are extensive purchasers of external vendor services; there is a steady move of their systems from Batch to RCS,
  - large users in Belgium on the other hand are infrequent users of external services; the tendency to in-house distributed solutions is an observed preference.

- Medium and small users in Holland are equally a target for:

  - on-line transaction processing systems supplied by an RCS vendor,
  - minicomputer-based in-house solutions provided by a systems house or software vendor.

- Both approaches have been observed in action during 1978. The mini computer solution is the one more often selected. This has produced a thriving market for systems and software houses, and some strong companies have developed. Dutch expertise in software is second in Europe only to that of the UK, and in some specialist areas e.g. publishing, is its equal or superior.

- Medium, small and first-time users in Belgium have tended to bypass the minicomputer solution in favour of a batch bureau because of:

  - the high cost of implementation relative to the size of their undertaking,
  - the low level of minicomputer expertise.

- These users are now an excellent target for the cheaper microprocessor-based solutions appearing on the market. Both processing services vendors and systems houses are currently attacking this sector with inexpensive hardware offerings.

F. MARKET ENTRY GUIDE LINES

- Services vendors are faced with four basic strategies with which to enter the Benelux market from outside:

  - marketing of external processing power (provided through a communications link or network), the "off-shore" approach,
  - acquisition of suitable locally-based companies,
  - joint venture with a chosen partner company,
  - creation of a local operation in Benelux from scratch.

- The first of these options is really only applicable to bureau vendors, but systems and software houses can choose an equivalent posture by retaining software production up to the system test stage in their home country.

- INPUT recommends a composite strategy which combines acquisition and/or a joint venture with some elements of the "off-shore" approach. Acquisition is preferable for processing services companies; the inclusion of a joint venture can be highly beneficial on the other hand to a systems company. In all cases it is a question of establishing a balance between:

BENELUX COMPUTER SERVICES MARKET FORECAST, 1978 - 1982

COUNTRY	SERVICE	1978		1982		AAGR
		$M	%	$M*	%	%
HOLLAND	RCS PROCESSING	80	25	142	23	15
	BATCH	142	45	240	39	14
	S/W. PRODUCTS	17	5	49	8	30
	PROF. SERVICES	80	25	180	29	22
	ALL	319	100	611	100	18
BELGIUM	RCS PROCESSING	60	30	113	26	17
	BATCH	81	40	158	37	18
	S/W. PRODUCTS	8	4	25	5	33
	PROF. SERVICES	52	26	131	32	26
	ALL	201	100	427	100	21
LUXEMBOURG	RCS PROCESSING	2	32	4	35	20
	BATCH	3	45	5	41	13
	S/W. PRODUCTS	-	6	1	9	29
	PROF. SERVICES	1	17	2	17	19
	ALL	6	100	12	100	19
ALL	RCS PROCESSING	144	27	259	25	16
	BATCH	229	43	403	38	15
	S/W. PRODUCTS	25	5	75	7	32
	PROF. SERVICES	134	25	313	30	24
	ALL	532	100	1050	100	19

* Constant 1978 dollars.

SOURCE: INPUT ESTIMATES

EXHIBIT II-4

- local presence, expensive but good for the image, and
- the most economic deployment of existing resources, in order to achieve market penetration on the planned timescale.

- For Holland, the most suitable city for basing an operation is Den Haag (The Hague), because of its central location among the Dutch user community and its proximity to the 'top people' (Government, PTT, Shell, etc). However, there are many flourishing Dutch companies operating from a base just outside one of the main centres but close to a motorway intersection giving access to the excellent motorway network.

- Brussels is the obvious choice for a base in Belgium, but another possibility is Liege. Luxembourg, though a pleasant city with good European communications, is at an extremity for the purposes of an intra-Benelux operation.

G. BENELUX MARKET DEVELOPMENT

- The forward development of the Benelux market through 1982 is shown in Exhibit II-4, in the same format as the earlier exhibit showing the 1977 and 1978 market values. In the market as a whole, RCS and Batch Services lose market share in the forecast period, while Software Products and Professional Services gain it.

- This movement is also reflected in the predictions for both Holland and Belgium.

- Exhibit II-5 allows the Benelux figures to be set in the European context, where we see that on present ranking Holland is number six in Europe and Belgium/Luxembourg together are number eight. Unless any of the 'Other' countries emerge during the forecast period to overtake them (and this is possible for a fast-developing country like Spain), this same ranking will hold in 1982.

EXHIBIT II-5

EUROPEAN COMPUTER SERVICES MARKET FORECAST, 1978 - 1982

COUNTRY	1978 ($ MILLIONS)x					1982 ($ MILLIONS)+					AVERAGE ANNUAL GROWTH RATE (%) 1978 - 1982				
	RCS		Batch	Other*	Total	RCS		Batch	Other*	Total	RCS		Batch	Other*	Total
	IA**	RB**				IA**	RB**				IA**	RB**			
FRANCE	82	198	631	355	1266	194	250	1308	867	2619	24	6	20	25	20
GERMANY	28	139	505	264	936	49	235	962	340	1586	15	14	18	7	14
UK/EIRE	86	102	270	248	706	210	144	506	605	1465	25	9	17	25	20
ITALY	24	35	297	194	550	30	39	576	376	1021	6	3	18	18	17
SWEDEN	34	82	240	139	495	83	120	420	339	962	25	10	15	25	18
HOLLAND	25	55	142	97	319	61	81	240	229	611	25	10	14	24	18
DENMARK	11	34	138	81	264	27	50	241	198	516	25	10	15	25	18
BELG/LUX.	25	37	84	61	207	59	58	163	159	439	24	12	18	27	21
OTHERS *	69	196	270	170	705	179	247	598	415	1439	27	6	22	25	20
ALL	384	878	2577	1609	5448	892	1224	5014	3528	10658	23	9	18	21	18

* Software Products, Turnkey Systems and Professional Services

** IA - Interactive, RB - Remote Batch

\+ 1982 dollars are expressed as "Constant" in that no inflation factor is applied: "Current" 1982 dollars will be higher, depending on the inflation rate, competitive environment, and product mix in each individual country.

x Captive Revenues are excluded; exchange Rates used for $1: 4.74 French Francs, 2.11 Deutsche Marks, 0.51 Pounds Sterling, 824 Lire, 4.65 Swedish Krone, 2.27 Guilders, 32.70 Belgian Francs, 5.25 Danish Krone.

* OTHERS refers to Norway, Finland, Austria, Switzerland, Spain and Portugal.

III. THE MARKET IN HOLLAND

III. THE MARKET IN HOLLAND

- The Dutch computer services market is ranked sixth in size among Western European countries, - behind only the four major industrial countries (France, West Germany, the UK and Italy) and Sweden. It is for its size one of the most sophisticated, - particularly in the matter of systems development. In some application areas, Dutch systems are the most advanced in the world.

- The Dutch market for all computer services was in 1978 approximately 45% of the UK market and 25% of the French market. Due to the open minded and free trading nature of the Dutch business community, it has become well developed by means of strong competition between Dutch national, other European and US vendors; between them they have created a market which is as well, or better, covered than any other comparable European country.

- Besides the strongly competitive element in the services marketplace, other factors contributing to this high state of development are:

  - geographically, the Netherlands is well placed to accept the inflow and outflow of new technologies into and out of the European mainland,

  - historically, the Dutch as a trading nation have an eclectic tradition, - selecting the best components and ideas from all sources and welding them into excellent products and services, to which they put their own name,

  - the presence of a strong financial and banking sector has fostered the services industry and aided investment in it,

  - with some of the largest worldwide corporations (e.g. Shell and Philips) having a home base in Holland, the Dutch as a people are used to being near the top of the league.

- This section of the report describes:

  - the development of the Dutch market in 1978,
  - the structure of the customer base,
  - the structure of the vendor organisations already in the marketplace,
  - some market opportunities which are present for exploitation in 1979 and 1980.

A. ECONOMIC STRUCTURE

- Until the last year or two the Dutch economy has grown steadily since the 1960s, underpinned by the North Sea natural gas revenues and the boost which they gave to the country's confidence in its future. As well as steady growth, the government was also reporting a controlled inflation rate. Recent analyses of the economy, however, have identified long term structural problems. During the 1970s the manufacturing base has not grown fast enough to provide a platform for the increased social services costs. A deficit has occurred which has been filled by taxing away profitability causing further loss of investment capability.

- These problems are being addressed by the government and plans are being laid down to take the Dutch economy through into the "post-natural gas" period. A first objective is to achieve a balance of payments surplus; (Dutch imports for 1977 and 1978 exceeded exports by 1% and 3% respectively).

- The economy's dependence on foreign trade is very heavy, only a minimum of raw materials being available from within the country. In fact, exports per capita are the second highest in the world, after Belgium's.

ADMINISTRATIVE MAP OF THE NETHERLANDS

EXHIBIT III-1

- Exhibit III-1 shows an administrative map of the Netherlands and marks the eleven provinces. Its source is INPUT's CAMP/HOLLAND database, which uses geographical areas based on these provinces to classify service companies by district. These areas are described below in relation to the country's industrial areas.

- Exhibit III-2 shows some basic economic indicators relating to the country's performance in the immediate past.

- Gross National Product has increased by an average 11.5% per annum since 1965, when taken at market prices. In real terms growth has been lower at 4% over the same period, and at the even slower rate of 3% per annum since 1975.

- The increase in population since 1965 has been at the annual rate of 0.9%, and has again been even slower since 1975 with a rate of 0.7%. At the same time, the two sections of the population aged (a) between 20 and 64, and (b) 65 and over have increased at above average rates of 1.5% and 2.2% per annum for the twelve years from 1965 to 1977. This indicates a marked trend towards fewer people supporting an increasingly aged and leisured community.

- Holland contains 169 thousand enterprises operating from approximately 310 thousand establishments.

B. USER CHARACTERISTICS AND REQUIREMENTS

- As is the case with all industrialised nations, the majority of computer users in the Netherlands are in either the manufacturing or the services sector of private industry. However, Holland is advanced in its usage of computers to such an extent that one can find them being applied in the agricultural and fishing industries also, and among small as well as large users.

BASIC ECONOMIC STATISTICS

NETHERLANDS

INDICATOR		YEAR	
		1977	1978
GDP	fl. B	232.1	250.4
	$B**	94.35	110.31
Population (millions)			
- Total		13.90	14.00
- Total Working		5.39	5.38
Agriculture, etc.		0.34	0.33
Manufacturing		1.75	1.72
Service Industries		3.30	3.34
No. of organisations * (thousands)		-	169
No. of establishments * (thousands)		-	310

\+ At market prices

** At current exchange rates

* These figures include the numbers engaged in agriculture, forestry and fishing, but exclude businesses run from home premises.

SOURCES: Amro Bank and INPUT estimates

EXHIBIT III-2

- Dutch agriculture is one of the most productive in the world. With over 60,000 enterprises operating in the sector, it offers a long-term market for very small business machines, and their associated software, implementation services and maintenance.

- The Dutch market has absorbed large numbers of mini-computers and small business systems into small and medium-sized companies. The competitiveness of Dutch industry and the productivity of the Dutch worker have both contributed to the willingness of management to invest in in-house small systems. A high degree of expertise in implementation of small business machines and minis has now developed within the Dutch software industry, as a result.

INDUSTRY LOCATION

- The Netherlands has an area of 15,900 square miles, and much of the land is devoted to agriculture in its various branches. About 40% of the country is below sea level and protected by dykes. Land reclamation is still in progress, i.e., the Delta Works in Zeeland and the reclamation of the former Zuider Zee, now known as Ijsselmeer.

The population of the Netherlands is fractionally below 14 million, and of those, 50% live in the region known as the 'Randstad' which is broadly the area formed by Amsterdam, Utrecht, Rotterdam and The Hague.

The country is divided into 11 provinces:

- NORTH HOLLAND

The principal city of North Holland is the capital, Amsterdam, which is also the country's second port. The port is linked to the North Sea by a 15 mile canal ending at the coast at Ijmuiden, which has the largest lock system in the world. The largest Dutch steel concern is also at Ijmuiden.

The Diamond Industry has its centre in Amsterdam.

All major industries are active in the area around Amsterdam, i.e., ship building, engineering, pharmaceuticals and plastics, and a wide range of light industry.

The province is also the home of the bulb growing area, Haarlem being the principal centre.

- SOUTH HOLLAND

One of the principal cities of the Netherlands, Rotterdam,now the largest port in the world, is in this province. It is surrounded by an extensive area of oil refineries centered at the so-called Europort, wher Shell, Esso, Chevron and Gulf Oil are all represented. The whole area is highly industrialised, most types of industry being present. Unilever has its main centre in Rotterdam and Shell certain of its main branches, i.e., Shell Trading.

The Hague is also in this province. As well as being the seat of the government, it houses the headquarters of the International Court of Justice.

Shell has its main Dutch office in The Hague.

The Netherlands has a comparatively large merchant fleet (11th in the world list) and this has also influenced port construction at Europort. There is an extensive inland water transport fleet, the Rhine being navigable up to Basle from Rotterdam.

Schevingen the coastal resort near The Hague is one of the largest fishing ports of Europe.

Note: These two provinces, North and South Holland, are what really to a Dutchman is the area known as Holland; the rest of the country is the Netherlands.

- UTRECHT

The smallest province of Holland, Utrecht is heavily industralised but also an intensive agricultural area. The city of Utrecht is the third largest city of the country.

These first three provinces form the Randstad.

- ZEELAND

This province is the site of the Delta Works, the project to close off the estuaries of the Rhine, Waal and Scheldt. Two inlets only are being left open to the North Sea - the canal from the Hook of Holland to Rotterdam (the Nieuwe Waterweg) and the Western Scheldt which gives access to Antwerp.

This work started in February 1957 and is now nearing completion.

Vlissingen (Flushing) is an important commercial and fishing port.

- NORTH BRABANT

The provincial capital of this province is s'Hertogenbosch (Den Bosch) but the main centre of industrial activity is Eindhoven, the home of Philips, 15th largest company in the world ranking list. Philips is Dutch owned as compared with Unilever (50% Dutch, 50% British), and Shell (51% Dutch, 49% British). Eindhoven is also the main centre of the Car Industry, Daf and Volvo being based here. Like all parts of the Netherlands most branches of agriculture are practised in the province.

- LIMBURG

Capital of the province is Maastricht. At one time this was the centre of the Dutch Mining Industry. Most of the mines are now closed but have been replaced by the Chemical Industry. The former Dutch State Mines, DSM, has its headquarters at Heerlen and is still the sixth largest Dutch Industrial company having diversified into many areas. There is also a Ceramic and Glass industry centred around Maastricht; the surrounding rural area is devoted to all branches of agriculture.

- GELDERLAND; OVERIJSSEL

The provincial capital of Gelderland is Arnhem and of Overijssel Zwolle. Akzo, fourth largest Dutch company, has its headquarters in Arnhem. It is one of the largest Dutch Chemical and allied product firms. Hengelo is also the centre of a highly industrial area. Both these provinces support intensive agriculture.

- DRENTE; FRIESLAND

The largest towns in these provinces are Assen in Drente, and Leeuwarden in Friesland. There are large oil fields in Drente and most areas of industry are present in the province, the Nederlandse Aardolie Mij having its headquarters in Assen. Friesland is the most highly agriculturised province of the Netherlands with only small pockets of industry.

- GRONINGEN

Natural Gas was discovered in the province in 1960 at Slocteren, and an industrial area was formed around Groningen to exploit and support this find. There is also an aluminium chemical industry here; otherwise most of the province is devoted to agriculture.

- Exhibit III-3 displays on a map of the country the favoured development areas and growth centres in each province.

INDUSTRIES AND THEIR USAGE OF EDP

- The leading industries in the Netherlands are:

  - Agriculture/Horticulture
  - Food Products
  - Electrical and Electronic Engineering
  - Chemicals
  - Oil and Gas
  - Shipping and the port of Rotterdam.

INDUSTRIAL AREAS

HOLLAND

* Enterprises which are transfered from a growth center to a development center cannot claim an investment premium.

** 1. premiums are available:
- for industrial projects in Terneuzen, Helmond, Tilburg, 's-Hertogenbosch, Nijmegen.
- for servicing ventures in Almelo, Hengelo, Enschede, Nijmegen.

2. premiums are available if certain conditions are met:
- for industrial projects in Vlissingen, Goes, Bergen op Zoom, Oss, Cuyk, Uden, Doetinchem, Zwolle, Kampen, Venray.
- for servicing ventures in Goes and Helmond.

EXHIBIT III-3

- In 1978, there were 169,000 organisations of all sizes operating in the Netherlands, excluding home-based businesses. An estimated 310,000 establishments were involved. An analysis of these enterprises by industry and size grading (small, medium, large) by annual turnover is shown at Exhibit III-4.

- The industry sectors with the largest number of enterprises (in order of ranking) are:

  - Agriculture/Forestry/Fishing,
  - Wholesale/Retail,
  - Manufacturing,
  - Transport/Communications.

- INPUT's "Europe 500 EDP Usage" survey in 1978 contained data collected in the Netherlands from 163 responses (41%) to a questionnaire mailed to 401 companies on the subject of 1978 usage and future trends.

- Exhibit III-5 gives an analysis of external services usage in the country as measured by that sample.

- 67% of the organisations contained in the survey sample (109 out of 163) are users of in-house computers. This is a lower middle level of in-house computer usage of all countries in the surveyed series:

Germany	90%
Belgium/Lux	82%
France	79%
Holland	76%
Sweden/Norway	70%

- Site occupancy by IBM, the dominant in-house equipment supplier is 47% for computers and 20% for terminals. These figures compare with 60% and 35% respectively in IBM's strongest European market, Germany. Honeywell and Burroughs are the next most successful suppliers, their combined site share being half of that achieved by IBM.

DISTRIBUTION OF ENTERPRISES BY SIZE AND INDUSTRY

NETHERLANDS

ISIC Code	Industry	Enterprise by Size of Annual Turnover (fl.)			
		<1.0M	1.0 - 100M	>100M	Total
11 - 13	Agriculture/Forestry/ Fishing,	65,000	1,450	50	66,500
21 - 29	Mining/Quarrying	600	300	25	925
31 - 39	Manufacturing	12,500	3,150	260	15,910
41	Electricity/Gas etc.	-	100	20	120
50	Construction	10,000	500	50	10,500
61 - 63	Wholesale/Retail	50,050	3,100	150	53,300
71 - 72	Transport/Comm	11,050	1,245	30	12,325
81	Financial	150	200	40	390
82	Insurance	50	135	25	210
83	Business Services/ Professions	8,000	400	100	8,500
91	Government	-	250	50	300
	TOTAL	157,400	10,830	800	169,030

EXHIBIT III-4

- Two thirds of all in-house installations have terminals connected; 27% of all in-house installations have more than 20 terminals connected.

- Nearly two thirds of IBM installations with terminals connected are supplied by IBM; the remainder are supplied (in order of site occupancy) by Datasaab, ITT, Data 100, Memorex and Harris. Honeywell and Burroughs installations exclusively use terminals from the mainframe supplier.

- Nearly half of all computer installations are occupied by mini-computers, often in addition to mainframes. The leading minicomputer suppliers are in order of site occupancy:

Datapoint	56%
IBM	28%
Philips	27%
ICL	20%
H-P	9%
DEC	9%

- The frequency of external services usage in the sample at 44% is mid-way between the extremes found in other European countries and similar to the UK and French markets.

Sweden/Norway	72%
Holland	44%
UK	43%
France	41%
Belgium/Lux	33%
Germany	25%

- In all countries there is a counter-balancing relationship between the frequency of external services usage and in-house installations. In Holland the second highest usage of external services is counter-balanced by the third lowest in-house usage. Sweden/Norway has the highest external services usage (72%) matched with the lowest in-house usage (70%); conversely Germany has the lowest external services usage (25%) matched with the highest in-house usage (90%).

LARGE ORGANISATIONS' PROCESSING SERVICES USAGE BY INDUSTRY

HOLLAND

ISIC	INDUSTRY	RESP %'GE	EXTERNAL SERVICES USAGE - %				IN HOUSE USAGE %
			ALL	B	RB	I	
11 - 13	Agriculture/Fishing	100	50	50	0	50	100
21 - 29	Mining/Quarrying	-	-	-	-	-	-
31	Food/Drink/Tobacco	45	41	22	11	22	93
32	Textiles/Clothing	42	63	63	0	13	75
33	Wood Products	20	100	100	0	0	0
34	Paper/Print/Publ.	32	0	0	0	0	89
35	Chem./Petrol/Coal	30	42	42	8	17	75
36	Non-Metallic Prod.	10	0	0	0	0	100
37	Basic Metal	70	57	14	14	29	71
38 - 39	Fabricated Metal Prod.	37	38	14	14	38	81
41	Electricity/Gas	24	83	50	33	33	67
50	Construction	64	61	33	22	33	39
61 - 63	Wholesale/Retail	45	38	31	0	23	85
71 - 72	Transport/Comm.	40	25	25	0	0	100
81	Financial/Banks	46	50	42	0	17	92
82	Insurance	35	20	20	0	10	100
83	Business Services	70	43	43	14	29	29
91	Government	20	80	40	60	10	40
OVERALL WEIGHTED AVERAGE		40	44	28	10	20	76

EXHIBIT III-5

- 20% of the organisations in the sample use both external and in-house services. This is a favourable market factor in that computer users are more likely to look for external and in-house sources of supply. Only in Sweden/Norway is this factor more encouraging where the overlap is 42%; elsewhere this factor is the same (France) or less at 15% or 16% in the UK, Germany and Belgium/Luxembourg.

- Some industries, notably Wood and Government are wholly or nearly wholly dependant on external services for computer usage. Conversely other industries, particularly Paper/Printing/Publishing and Non Metallic Products are more dependant on in-house services.

- The industries with above average usage of both external and internal services are Agriculture/Fishing, and Financial Institutions; these sectors may be approaching saturation point for existing products and services.

- Of the organisations which use external services in Holland, 28% use Batch Services (23% Belgium/Lux and 53% Sweden/Norway), 10% use Remote Batch (3% Belgium/Lux and 23% Sweden/Norway), and 20% use Interactive (14% Belgium/Lux and 33% Sweden/Norway).

- The most frequent users of Remote Batch services are to be found in Utilities, Construction and Government.

- The most frequent users of Interactive services are to be found in Agriculture/Fishing, Fabricated Metal Manufacturing, Utilities and Construction.

- The growth prospects for Batch and Remote Batch Services in the large organisations included in the survey are pessimistic; the future is however optimistic for Interactive Services.

APPLICATION AREAS AND SOURCES - INDUSTRIAL SECTOR

- The most computerised application areas overall regardless of source are:

    1. Bookkeeping/Payroll
    2. Production/Stock Control
    3. Marketing/Sales
    4. Personnel
    5. Financial Analysis/Planning

  The pattern will be the same in two years time excepting that Financial Analysis will displace Personnel in fourth position.

- The most frequent use of external services currently occurs in:

    1. Bookkeeping/Payroll
    2= Personnel
    2= Technical/Scientific
    4. Marketing/Sales

  In two years time Bookkeeping/Payroll and Technical/Scientific will still be the most popular followed by Financial Analysis/Planning and Personnel.

- Some significant source changes are anticipated by users over the next two years. The most notable of those is the migration to internal and User Site Hardware Services generally at the expense of conventional external services, particularly Batch and Remote Batch.

- The move towards internal services will be most pronounced in:

    1. Financial Analysis/Planning
    2. OR
    3. Technical/Scientific
    4. Numerical Control
    5. CAD

APPLICATION AREAS, USAGE AND TRENDS - INDUSTRIAL

	MOST COMPUTERISED APPLICATIONS		BEST GROWTH APPLICATIONS
	OVERALL	EXTERNAL	
Agriculture/Fishing	Tech./Scientific Prod./Stock Control Commerce/Sales	Computer Aided Design Commerce/Sales Personnel	Tech./Scientific Prod./Stock Control Commerce/Sales
Food/Drink/Tobacco	Prod./Stock Control Commerce/Sales	Stat. Analysis	Prod./Stock Control Fin. Plan. & Analysis
Textiles/Clothing	Prod. Stock Control Commerce/Sales Bookkeeping/Payroll	Bookkeeping/Payroll Prod./Stock Control	Prod./Stock Control Commerce/Sales
Wood Products	Stat. Analysis Commerce/Sales Bookkeeping/Payroll	Stat. Analysis Commerce/Sales Bookkeeping/Payroll	Stat. Analysis Commerce/Sales Bookkeeping/Payroll
Paper/printing	Prod./Stock Control Commerce/Sales	-	Prod./Stock Control Commerce Sales
Chem./Petroleum/Coal	Bookkeeping/Payroll Commerce/Sales	Bookkeeping/Payroll	Prod./Stock Control Commerce Sales
Non-Metallic	Commerce/Sales Bookkeeping/Payroll Fin. Plan. & Analysis	-	Commerce/Sales Bookkeeping/Payroll Fin. Plan. & Analysis
Basic Metal	Prod./Stock Control Bookkeeping/Payroll	Bookkeeping/Payroll	Prod./Stock Control
Fabric. Metal	Bookkeeping/Payroll Prod./Stock Control Commerce/Sales	Tech./Scientific Commerce/Sales	Prod./Stock Control Bookkeeping/Payroll

EXHIBIT III-6

- The move towards User Site Hardware Services will be most pronounced in:

  1= Production/Stock Control
  1= Bookkeeping/Payroll
  3= Marketing/Sales
  3= Financial Analysis/Planning
  5. Numerical Control.

- Overall, the best growth in usage will occur in:

  1= Production/Stock Control
  1= Financial Analysis/Planning
  2. Marketing/Sales
  3. Bookkeeping/Payroll
  4. Personnel
  5. Statistical Analysis

- The top two growth prospects also have the best potential for distribution on standard products in many European countries since they are largely unaffected by differencies in law, taxation and accounting conventions.

- Exhibit III-6 summarises the application preferences in the industrial sector, and gives the present usage and trends in the individual industries.

APPLICATION AREAS AND SOURCES - FINANCIAL SECTOR

- The most computerised application areas both now and in two years time are:

  1. Bookkeeping
  2. Financial Transactions
  3. Payroll
  4. Financial Consolidation.

- The application areas for which external service vendors are most frequently used are:

    1. Payroll
    2. Financial Analysis/Planning

- Exhibit III-7 summarises the application preferences in the Financial/Commercial sector and gives details of the present usage and trends in the individual industries.

GROWTH OPPORTUNITIES

- Distributed in-house processing is estimated by users to experience an annual growth rate of 23%.

- The prospects for User Site Hardware Services look extremely encouraging; users estimate a 31% annual growth rate.

- Holland is one of only two European countries (the other is Norway) in which higher growth is anticipated by users for User Site Hardware Services than for in-house DDP.

- The best prospects for growth in the Dutch market for a bureau services company are Interactive and On-Site services. In terms of application areas this growth is most likely to be realised in:

    1. Production/Stock Control
    2. Financial Analysis/Planning
    3. Accounting/Payroll
    4. Statistical Analysis.

    The first two are subject to less variation to meet the needs of different European countries and thus represent the best investment potential for a multi-national vendor.

APPLICATION AREAS, USAGE AND TRENDS - FINANCIAL/COMMERCIAL

	MOST COMPUTERISED APPLICATIONS		BEST GROWTH APPLICATIONS
	OVERALL	EXTERNAL	
Electricity/Gas	Tech./Scientific Prod./Stock Control Commerce	Tech./Scientific Prod./Stock Control Commerce	Tech./Scientific Prod./Stock Control
Construction	Bookkeeping/Payroll Prod./Stock Control	Bookkeeping/Payroll Tech./Scientific	Fin. Plan. & Analysis Prod./Stock Control
Wholesale/Retail	Bookkeeping/Payroll Prod./Stock Control	Bookkeeping/Payroll	Stats. Analysis
Transport/Communication	Prod./Stock Control Personnel Bookkeeping/Payroll	Personnel Bookkeeping/Payroll	Commerce/Sales Fin. Plan. & Analysis
Banks	Bookkeeping Fin. Transactions	Payroll Fin. Plan. & Analysis	Fin. Transactions
Insurance	Bookkeeping Fin. Transactions	Payroll Fin. Plan. & Analysis	Fin. Transactions
Business Services	Payroll Bookkeeping	Payroll Consultancy	Bookkeeping
Government	Bookkeeping/Payroll Fin. Plan. & Analysis	Personnel	

EXHIBIT III-7

- The industries which are likely to provide the best growth for the top two application areas are as follows:

Production/Stock Control	Financial Analysis/Planning
Food/Drink	Construction
Textiles/Clothing	Food/Drink
Paper/Printing	Transport/Communication
Chemicals/Petroleum	
Basic Metal	
Fabric. Metal Manufacturing	

- The table in Exhibit III-8 shows the growth of processing services by size of company and mode of delivery.

C. COMMUNICATIONS FACILITIES

- The Dutch PTT is situated in The Hague (see Appendix E for main contact addresses). The present telephone standard data communications service offers the cheapest line costs in Europe with excellent quality:

  - Leased line costs are about one tenth of those of France and public switched network lines are also far cheaper,
  - Connection costs are equivalent to those of the U.K.

- The PTT is planning the introduction of a new packet-switched data service. This service, called DN-1, is planned to be available to seven major data communication users before the end of 1979. The PTT is working with the manufacturer on the functional specification of the network and on the definition of the interface between the network and the users. The seven initial users of DN-1 and the PTT itself form the 'Userclub DN-1' which is responsible for approval of the specification.

EXTERNAL PROCESSING SERVICES GROWTH BY COMPANY SIZE: OVERALL MARKET

THE NETHERLANDS

SIZE	BATCH	REM. BATCH	INTERACTIVE	ON SITE
Large	-13%	-1%	+16%	+31%
Medium *	0%	+8%	+15%	N/A
Small *	+10%	+2%	+5%	N/A
OVERALL	+14%	+10%	+25%	N/A

Notes: * These figures are INPUT estimates, cross-checked against market trends derived from the CAMP/HOLLAND database.

EXHIBIT III-8

- The interface between the network and the user will be as far as possible in accordance with CCITT Recommendation X.25. At level 2, only LAP-B will be implemented. Other interfaces will not be offered initially.

- The initial users of DN-1 are expected to connect 15 host computers and about 1400 terminal interface processors to the network. An average of 5 terminals per interface processor are anticipated.

- Exhibit III-9 details the network scheme at present envisaged; this may be subject to variation when finally implemented:

  - The heart of DN-1 consists of three packet switching exchanges (PSE) in Amsterdam, Arnhem and The Hague, and 62 packet data satellites (PDS) situated in the most important towns.

  - A PDS is a packet interleaved multiplexer which is connected to a PSE by two 64 kbit/s transmission circuits. Each interconnection between two PSEs consists of three 64 kbit/s circuits.

  - The transmission part of the network will consist of modems and data circuit terminating equipments (DCE). Modems will be placed in the PSEs and PDSs, DCEs on the customers' premises. 70% of customers will be connected to the network by baseband equipment and 30% by voice frequency equipment.

- On the other hand, plans for a circuit switched digital facility are still at the feasibility stage. Nothing is expected to be provided until at least 1982, and developments in neighbouring countries are being studied with interest.

D. MARKET SIZE BY TYPE OF SERVICE, 1978

- The Dutch Computer Services Market exceeded the $300 Million mark in 1978, reaching an estimated $319 Million.

DUTCH PACKET SWITCHING SERVICE

KEY

- Network Operation and Management Centre (NOMC)
- Packet Switching Exchange (PSE)
- Packet Data Satellite (PDS)
- Control Link
- Transmission Link between PSEs

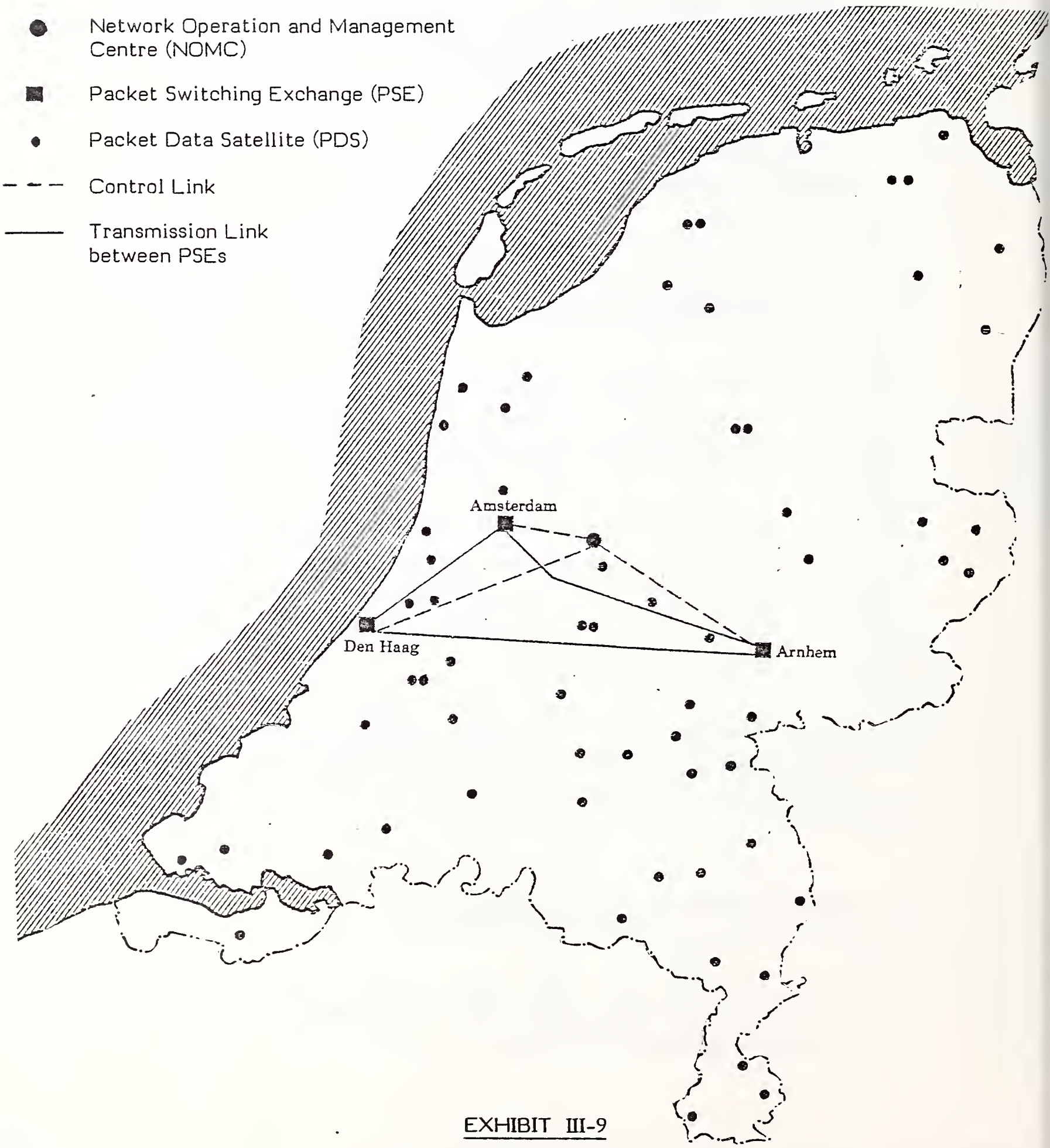


EXHIBIT III-9

- Exhibit III-10 gives a breakdown of this revenue between Batch, RCS and Software/Professional Services; and compares it with the equivalent breakdown of the revenues of the Top Ten companies operating.

- Batch Services tended to dominate the market share in both the cases illustrated. This is due to:

  - the strength of the large and medium-sized indigenous service bureaux and the time they have had to establish traditional batch-style commercial applications.

- The second largest sector in both cases is the Software/Professional Services; growth in this area is expected to be particularly good because of the interest in minicomputer-based Turnkey Systems as supplied by the Dutch software companies.

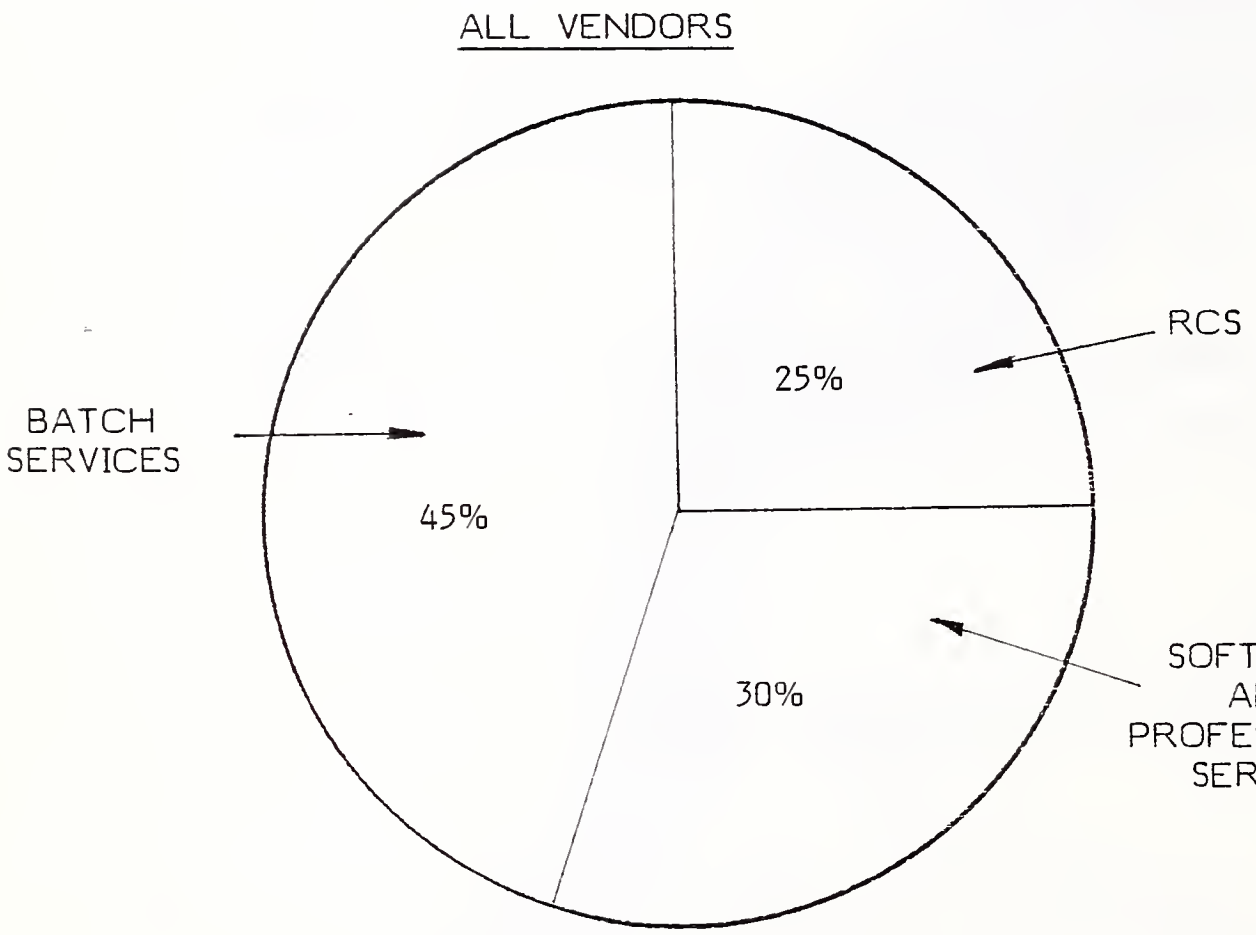
E. COMPETITION AND VENDOR MARKET SHARES

- Per head of population, the Dutch market is very prolific of computing services companies - 257 for a population of just on 14 million, or one for every 54,400 persons.

- An indicator of the value of the services market in Holland is the vendor revenue per head of population, which comes out at $22.8 for 1978. This figure is higher than that for any of the major European countries' markets, except France:

-	France	-	$23.72
-	West Germany	-	$15.34
-	UK	-	$12.61
-	Italy	-	$10.58

THE DUTCH COMPUTER SERVICES MARKET 1978



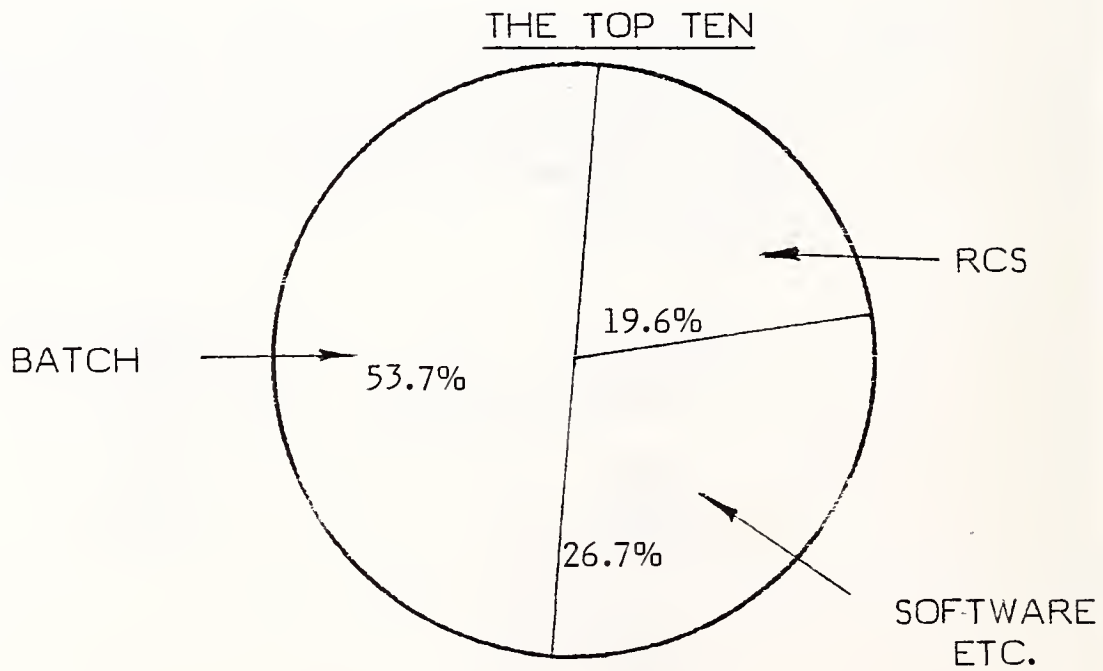


EXHIBIT III-10

Since costs and selling prices in Europe vary, the figures quoted need strictly to be compared on some indexed basis. Nevertheless, we can say that the Dutch market is as active as other European markets, taking approximately 6% of the total revenues in Western Europe.

- Of the 257 vendor companies, the systems and software houses and consultancies form 44% with 114 enterprises against 143 organisations whose main activity is a processing service of some kind, whether batch, RCS or data prep.

- An analysis of the vendor population derived from INPUT's CAMP/EUROPE database is shown in Exhibit III-11. This table gives the distribution of vendor companies by size groups and principal activity. Four size groups are used:

  - Group Code A had annual turnovers (1978) greater than $10M,
  - Group Code B had annual turnovers between $10M and $1M.
  - Group Code C had annual turnovers between $1M and $0.1M,
  - Group Code D had annual turnovers less than $0.1M.

The total vendor population in the database exceeds the number with a stated or estimated turnover. Eighty-five companies could be attributed an annual turnover, and this was 33.1% of the total population.

- Examination of the population by size groups shows, as one would expect, a preponderence of medium and small companies - Codes B and C.

- Exhibit III-12 shows the revenue breakdown of the Top Ten vendors by the three major categories of service type. The table is now headed by Central Beheer a large national insurance group. In 1978 due to the acquisition by Central Beheer's CEA of the previously independent CSR, the group's turnover exceeded that of CVI. Third place was held by ARSYCOM the largest software house in the field, turning over considerable revenue in turnkey systems.

DISTRIBUTION OF SAMPLE COMPUTER SERVICES COMPANIES IN HOLLAND BY 1978 TURNOVER AND PRINCIPAL ACTIVITY

US $

TURNOVER / MAIN ACTIVITY (CODE)	>10M (A)		10M - 1M (B)		1M - .1M (C)		≤0.1M (D)		ALL WITH T/O		SAMPLES as % of TOTAL POPN.	
RCS BUREAU	7	8.2%	8	9.4%	1	1.2%	-	-	16	18.8%	73% of	22
BATCH BUREAU	1	1.2	17	20.0	16	18.8	-	-	34	40.0	48%	71
SOFTWARE AND PROFESSIONAL SERVICES	3	3.5	16	18.8	12	14.1	1	1.2	32	37.6	28%	114
OTHER (EG COM, DATA PREP.)	-	-	1	1.2	2	2.4	-	-	3	3.5	6%	50
ALL WITH T/O.	11	12.9	42	49.4	31	36.5	1	1.2	85	100	33%	257

EXHIBIT III-11

- Exhibit III-13 gives the ranking of major suppliers in each of the three main service categories - Batch, RCS and Software/Professional Services.

- There are twenty-five (25) different companies included among the top ten of each of the three service types. The world-wide multi-nationals dominate the RCS ranking, but national companies with a sprinkling of European multi-nationals are mostly in evidence in the other two classes.

- Only in RCS is IBM dominant, showing:

  - the strength of the national vendor population,
  - IBM's new policy of only selling terminal-based services.

- The Top Ten companies accounted for $125 Million or just over 39% of the total market for 1978.

F. COMPARISON OF VENDOR MARKETING STRATEGIES

- The Netherlands has tended to be forward-looking in its approach to computing, applying advanced as well as established techniques in both the commercial and the operational aspects of its services businesses. The Dutch businessman is attuned to the concept of investment in new generations of product in order to maintain growth, market share and profitability.

- Some reasonably large national companies have emerged as a combined result of acquisition, natural growth and investment in new products. Notable examples are:

  - CEA
  - CVI
  - ARSYCOM

THE TOP TEN COMPUTING SERVICES VENDORS - HOLLAND 1978

SOURCE: CAMP/EUROPE

RANK	VENDOR	REVENUE IN MILLIONS OF DUTCH GUILDERS (fl. M)			
		BATCH	RCS	SOFTWARE & PROFESSIONAL	ALL SERVICES TOTAL
1	CENTRAL BEHEER CEA (AND CSR)	38.0	4.0	5.0	47.0
2	CVI	34.0	6.8	4.6	45.4
3	ARSYCOM	8.0	3.0	19.0	30.0
4=	CCN	12.5	7.4	5.1	25.0
4=	RAET	13.8	4.8	6.4	25.0
6	CMG	3.8	1.1	18.4	23.3
7	SAMSOM	10.9	1.1	10.9	22.9
8	ARC	19.8	1.1	1.1	22.0
9=	ACD	10.0	6.2	5.4	21.6
9=	IBM	1.6	20.0	-	21.6

EXHIBIT III-12

TOP SUPPLIER RANKING BY SERVICE TYPE - HOLLAND 1978

BATCH SERVICES	REMOTE COMPUTING SERVICES	SOFTWARE & PROFESSIONAL SERVICES
CENTRAL BEHEER CEA (AND CSR)	IBM	ARSYCOM
CVI	GEIS	VOLMAC
ARC	CDC	CMG
ADP-BENELUX	CCN	FDO
RAET	CVI	LOGICA
CCN	ACD	SAMSOM
SAMSOM	ADP-NIS	NOVA
ACD	RAET	PANDATA
HOLLAND DATA	COMSHARE	INFONET
SMRA	DATA PROCESS	RAET
VELDEN	UCC	ACD
		CCN
		CVI
		ARC

SOURCE: CAMP/EUROPE

EXHIBIT III-13

- Multi-nationals mainly US but also some European, have taken an interest in Holland not only for its own home market potential, but also as a springboard into Europe. IBM is well established as the leading equipment supplier; Honeywell and Burroughs also have substantial installed bases. Among the services companies we find GEIS, CDC, ADP, Comshare and UCC all in contention for the RCS sector; European companies such as CMG, Logica, Cap-Gemini (Pandata) have sought out the Dutch marketplace beacuse of the benefit of its highly-developed software sector.

- Appendix C contains profiles of a range of service companies in the Netherlands:

  - vendors of different types of services,
  - vendors of different sizes.

G. ESTABLISHING A COMPANY IN HOLLAND

- Five factors, all of them favourable, make the Netherlands an attractive market for the RCS vendor:

  - profits from holding companies established there can be transferred out of the country without local taxes being applied;
  - the Dutch are bi-, tri- or quadri-lingual, dependable and uncomplicated;
  - communications costs are very low and of good quality;
  - road and air traffic facilities are good;
  - the Netherlands are centrally situated with respect to all of the other Western European countries.

- The Netherlands is located almost in the centre of the large Western European industrial areas with easy access to Paris, London, Brussels, The Ruhr, Bremen, Hannover etc. A market of 180 million people lies within an hour's flight (see Exhibit III-14).

ACCESS FROM THE NETHERLANDS

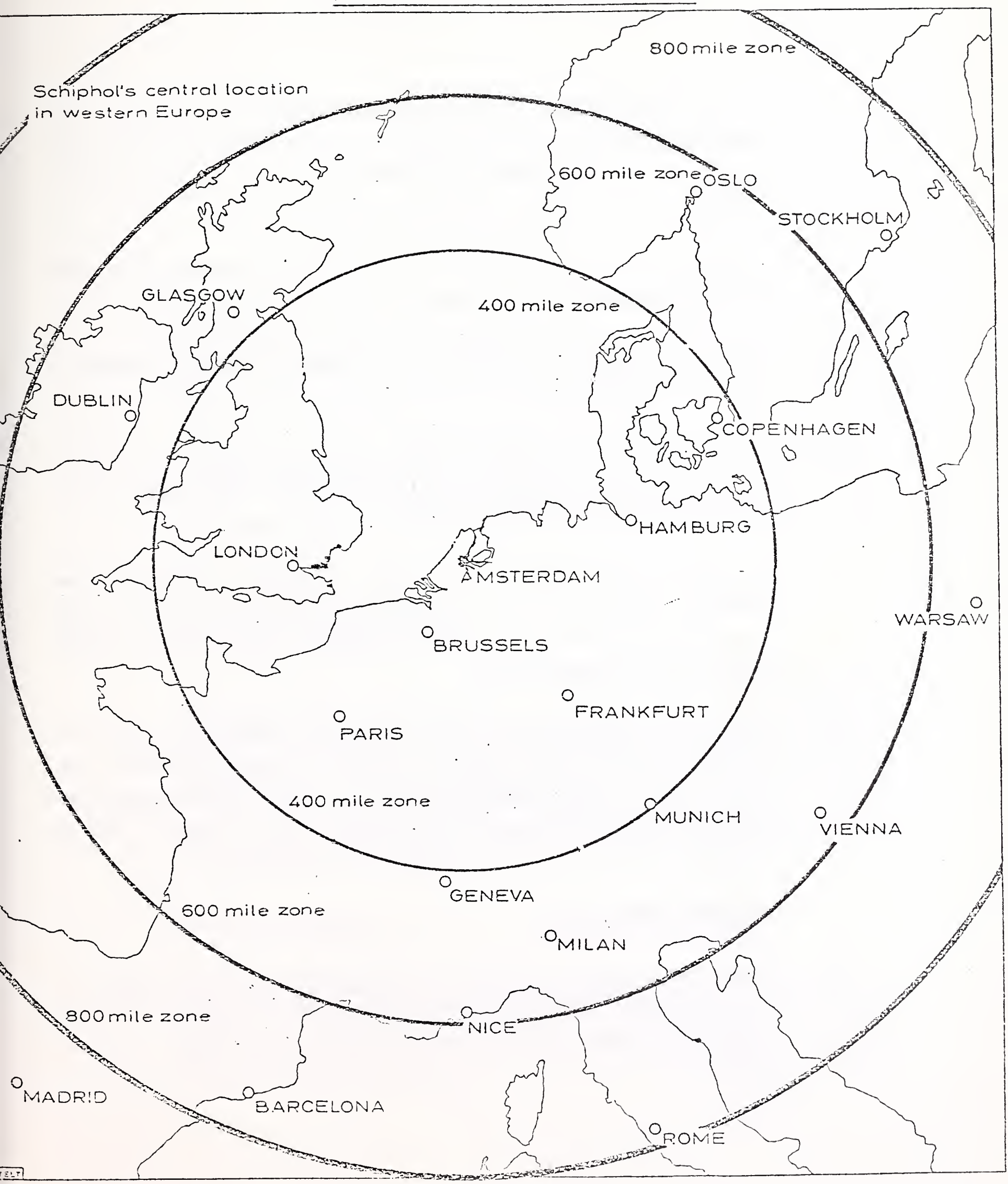


EXHIBIT III-14

- The vast majority of Dutch businessmen speak English and German, to the extent that it is unnecessary to speak Dutch for initial operations (although on-going activities on the Dutch market itself are best carried out in Dutch, of course).

- The Dutch customs system provides a number of free trade zones which offer attractive advantages for the movement of all types of merchandise.

- There are no special restrictions on the ownership by foreign enterprises of property in Holland.

- No corporation tax is paid by holding companies established in Holland. Profits and dividends can be transferred without licence in the currency of the destination country or in Dutch Guilders.

- A licence is not required for the transfer of capital repayments or the proceeds of liquidation of a venture, regardless of whether the investment was or was not evidenced by certificates of listed or unlisted stock, provided certain simple rules are followed.

- A convertible Guilder account may be maintained in a Dutch bank by any non-resident, and deposits and debits may be made for transfer anywhere in the world. Both a foreign managed international company in the Netherlands and a foreign supplier wishing to free his Dutch customers from all foreign exchange formalities can take advantage of such an account.

COMPANY STRUCTURE

- A Dutch company must have either a Managing Director (De direkteur) or a Managing Board and "large" companies must also have a Supervisory board of at least three physical persons (RAAD VAN COMMISSARISSEN). "Large" means:

(a) issued capital and reserves >10M Guilders.

(b) total company (i.e. all offices and subsidiaries together in Holland) staff > 100 employees.

(c) the company has a holding of 50 percent or more in a company of size (b).

- The supervisory board operates with a degree of independence from both shareholders and from the management of the company. The members of this board are appointed initially by the General Meeting of the Shareholders and vacancies are co-opted by the remaining members.

- In "large" Dutch companies the Supervisory Board appoints and dismisses the Managing Director and must approve certain resolutions (listed by the Commercial Code). Supervisory Directors need not be shareholders nor have Dutch Nationality.

MULTINATIONAL COMPANIES

- Companies which are part of a group of companies with a majority of their employees outside The Netherlands are exempt from certain regulations concerning the Supervisory Board of large companies. For instance, the power to appoint and to dismiss Managing Directors and to determine the annual accounts may remain in the General Meeting of Shareholders. It is also possible to enable this type of company to avoid undesired publication of their financial results.

TYPES OF COMPANY

- Companies organized under the laws of countries outside The Netherlands may operate in The Netherlands through one or more branches. Except for operations of a relatively small size it will, however, usually be recommended to choose a Dutch business form.

- The Commercial Code of The Netherlands provides for several forms of enterprise. The most common ones are:

  - the "Naamloze Vennootschap", for short "N.V.", which in many respects resembles the American corporation, the British public limited liability company, the German Aktiengesellschaft and the French Societe Anonyme.

  - the "Besloten Vennootschap met beperkte aansprakelijkheid" or "B.V.", which in many respects resembles the British private limited company, the German Gesellschaft mit beschrankter Haftung and the French Societe a responsabilite limitee.

- Although various forms of partnerships are also known in The Netherlands, it would normally seem advisable to adopt the form of N.V. or B.V. These forms offer the benefit of having corporate personality separate from that of the members, and of having limitation of the liability of the shareholders to the amount of their obligatory contributions to the company's capital as required by the Articles of Incorporation.

RECOMMENDATIONS

- As with Belgium, barring acquisition, the Dutch market is too small to allow new entrants a reasonable chance of success. All of the major prospects have been identified long ago and are regularly visited by the existing vendors.

- For tax reasons, for the flexibility offered by Dutch staff (who frequently speak four languages - English, French, German, and Dutch - which is also understood by the Flemish part of Belgium) and for the tax rules applying to the movement of capital into and out of the country, the Netherlands can be a useful base for European operations, once they have grown to international proportions. As such, a holding company in Holland makes sense, even if straight market entry does not.

- The very low cost of telecommunications and the central location of the Netherlands with respect to large regions such as the Ruhr-Gebiet (Germany) has encouraged General Electric to locate its supercenter in the Netherlands. A circle of 400 miles around Amsterdam covers all of West Germany, most of England and Scotland, Berne, Paris, Belgium, and Luxembourg.

IV. THE MARKET IN BELGIUM

IV THE MARKET IN BELGIUM

- Belgium presents overall a smaller market than Holland, and one which is less well developed. The smaller size of the market is due to the smaller population. Belgium has a population just under 10 million, while Holland's has now risen to over 14 million.

- The fact that the Belgian market is less developed than the Dutch results from:

  - the large number of small enterprises in Belgium,
  - the absence of any Belgian multi-national companies of the stature of Royal Dutch Shell, Unilever, or Philips.

  The first factor has led to a slower transition from manual methods to traditional batch processing; the second factor has meant that Belgian organisations are not automatically in the forefront of computing technology and applications.

- The Belgian market, on the other hand, being relatively speaking less developed is now beginning to present a range of opportunities for computer services, and these opportunities stem from the specially Belgian characteristics of this country's business environment:

  - the number of small organisations,
  - the compact size of the country,
  - the presence of the European headquarters of many foreign multi-nationals.

- This section of the report describes:

  - the development of the market in 1978,
  - the appearance of a number of market opportunities, in 1979,
  - the structure of the customer and supplier organisations already in this market-place.

A. ECONOMIC STRUCTURE

- Located as it is at the cross-roads of Western Europe's main lines of communication, close to the Rhine-Meuse-Scheldt delta, Belgium owes its status as an important industrial position to:

  - its favourable geographical position,
  - coal and iron deposits,
  - skilled manpower.

- Belgium has since 1921 been in an economic union with Luxembourg - the Belgo-Luxembourg Economic Union (B.L.E.U.). Since the B.L.E.U. accounts for between 3% and 4% of world trade, Belgium, as a trading nation, is very heavily dependent on the state of the world economy. The oil crisis of 1974, therefore disturbed the internal economy of the country and initiated a period of unemployment, inflation and slow growth in real terms.

- Some 40% of Belgian exports are to West Germany; the slow growth policy exercised in recent years by that country's government has caused a correspondingly slow recovery in the Belgian economy. This has been a period when:

  - Belgian government and trade sponsoring bodies have been seeking new markets particularly in the developing countries,
  - the private sector has had the opportunity to reexamine and overhaul business systems and methods.

EXHIBIT IV-1

NORTH SEA

NETHERLANDS

GERMANY

FRANCE

Brugge
Oostende
Turnhout
St-Niklaas
Eeklo
Maaseik
Veurne
Tielt
Mechelen
Diksmuide
Roeselare
Dendermonde
Vilvoorde
Leuven
Hasselt
Aalst
Oudenaarde
Tongeren
Ieper
Kortrijk
Halle
Mouscron
Ath
Waremme
Tournai
Soignies
Nivelles
Verviers
Namur
Huy
Mons
CHARLEROI
Thuin
Philippeville
Dinant
Marche-en-Famenne
Bastogne
Neufchâteau
Virton
Arion

1 BRUSSELS
2 ANTWERPEN
3 West-Vlaanderen
4 GENT
5 Limburg
6 BRABANT
7 Hainaut
8 Namur
9 Liège
10 Luxembourg
11 LUXEMBURG

ADMINISTRATIVE BELGIUM

Provincial boundaries

Large urban areas

District chief towns

- Exhibit IV-1 gives an administrative map of Belgium, showing provincial boundaries and large urban areas. The source of the map is CAMP/Belgium/Luxembourg. For the purposes of the CAMP programme, both countries have been grouped together and divided into eleven regions. These regions are explained later in relation to the important industrial areas.

- Exhibit IV-2 shows certain basic economic indicators relating to Belgium's performance over the last ten years.

- Gross National Product (GNP) has increased by an average 13% per annum in actual terms. In real terms growth has been minimal (between 1% and 3%).

- Population increase has been at an annual average rate of around 0.4%. However, the working population has increased at the rate of 0.8% per annum, indicating in a time of increased unemployment and with an ageing population that the stagnant economy has given impetus to an increase in the number of bread-winners per family unit.

- Belgium has a high proportion of its organisations with more than one establishment. The ratio of establishments to organisations is 1.96 - higher than that in most other European countries.

B. USER CHARACTERISTICS AND REQUIREMENTS

- Belgium's agricultural workers form 3.0% of the working population, compared with 6.5% for West Germany, 9.9% for France and 2.7% for the U.K. The agricultural sector is responsible for meeting approximately 80% of the nation's food requirements, by intensive farming methods. The average farm is between $2\frac{1}{2}$ and 50 acres. The sector is responsible for approximately 3% of GNP.

- The vast majority of computer users are in the manufacturing and services sectors where are found most of the largest enterprises.

BASIC ECONOMIC STATISTICS

BELGIUM

INDICATOR		YEAR		
		1970	1974	1978
GDP	BFB	1,132	1,866	2,564
	$B**	29.75	49.0	78.40
Population (millions) - Total		9.65	9.79	9.95
- Total Working		3.83	3.99	4.08
Agriculture, etc.		0.17	0.14	0.12
Manufacturing		1.58	1.57	1.53
Service Industries		2.07	2.28	2.43
No. of organisations * (thousands)		-	-	148
No. of establishments * (thousands)		-	-	290

** At current exchange rates.

* These figures include the numbers engaged in agriculture, forestry and fishing.

SOURCES: Belgian N.I.S. and INPUT estimates

EXHIBIT IV-2

INDUSTRY LOCATION

Exhibit IV-3 names the principal industrial towns situated in the ten provinces. The areas used are the same as those shown in the previous map (Exhibit IV-1).

Areas 1 and 6 : Brussels and environs

Brussels, capital of Belgium, is the seat of Government; and now with both the headquarters of NATO and the European community in the capital, a European city as well as the principal commercial city of Belgium. There is a wide range of industrial activity in the Brussels area and in Brabant, the surrounding province. The Automobile, Paper, Chemical, Machinery and Mechanical Engineering, Ceramics and Food Industries are all active in the area.

Area 2 : Antwerp Area

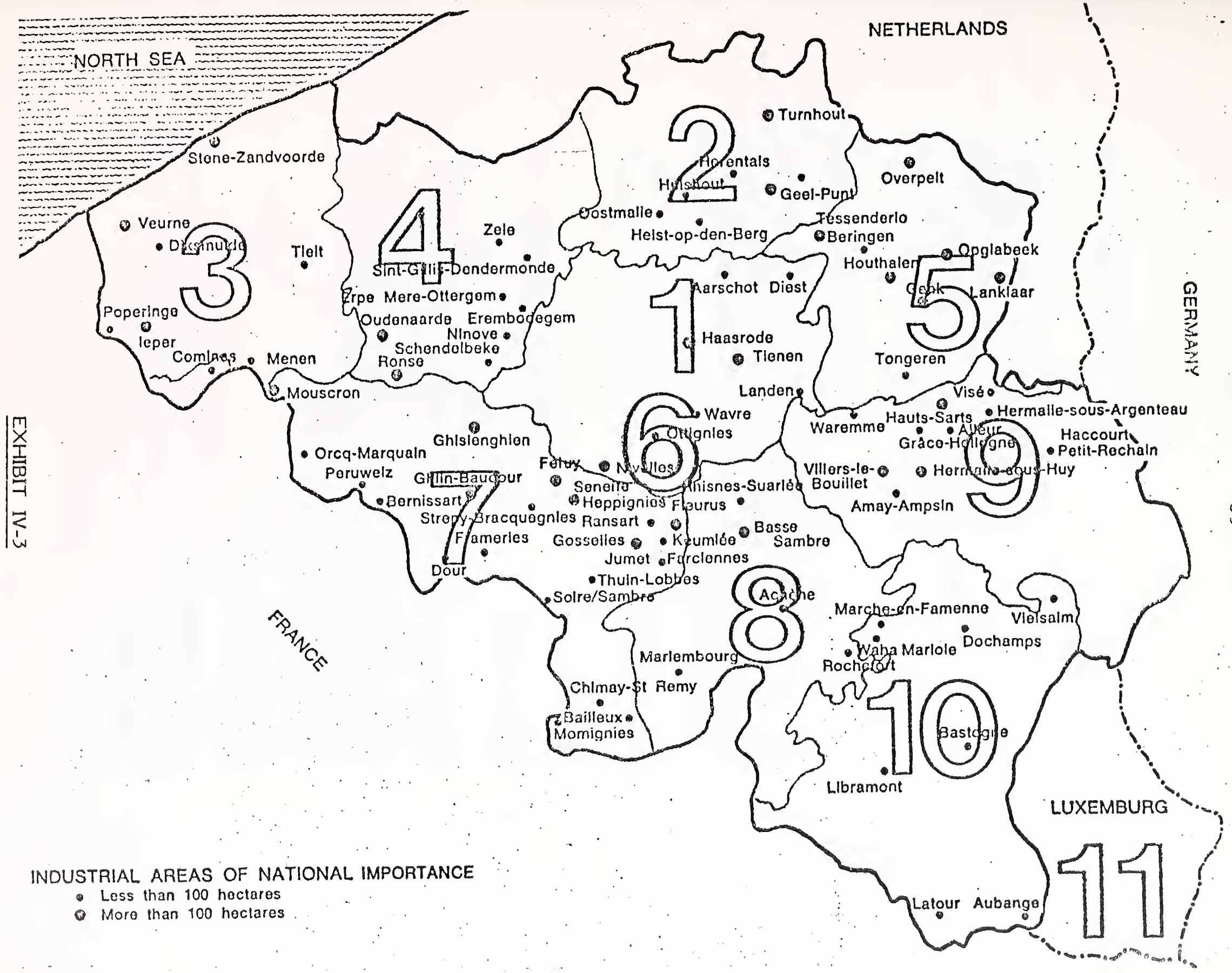
Antwerp, the third largest seaport in continental Europe and the fourth largest in the world, handles 90% of all Belgian overseas trade. It is also the centre of the diamond industry, which remains one of Belgium's most highly specialized sectors, and represents 3% of the country's total exports.

The area is heavily industrialised; besides ship-building, there are extensive industrial complexes covering Machinery and Mechanical Engineering, Non-Ferrous metals, Chemical and Brewing industries.

Area 3 : West Flanders

Bruges, the principal city of West Flanders, was at one time the principal port of Belgium; it is the centre of one of the principal agricultural areas of Belgium and has the channel ports of Ostend and Zeebrugge in the province.

The principal industries of the area are Glass and Chemicals with some shipbuilding.



INDUSTRIAL AREAS OF NATIONAL IMPORTANCE

- Less than 100 hectares
- More than 100 hectares

Area 4 : East Flanders

Gent is the principal city of East Flanders and the centre of the Textile industry of Belgium. There is also a thriving Leather industry and the surrounding areas are again, like West Flanders, largely agrarian.

Area 5 : Limburg

The least densely populated or industrialised part of Belgium, there is a growing area around Genk (on the Dutch border) which is a coal mining area. Here there is a rapidly expanding industrial area, principally specialising in the Chemical and Metallurgical fields. The rest of the region is largely engaged in timber and agriculture.

Area 6 : Brabant

See area 1.

Area 7 : Hainaut

One of the heaviest industrial areas of Belgium, the mining, steel and chemical industries occupy large areas of the province principally around the cities of Mons and Charleroi. SHAPE has now its headquarters at Mons, making this the third international organisation to have its headquarters in Belgium. There is a large horticultural area around Tournai.

Area 8 : Namur

Heavily agricultural, this province contains the tail end of the coal mines of both the Charleroi and Liege areas encroaching into it and the lower reaches of the Ardennes starting in the East of the province.

- Area 9 : Liege Area

Liege, one of the heaviest industrial areas of Belgium, has an extensive coal mining district. The centre of the Belgian small arms industry and a thriving crystal and glass industry are also here. All the principal industries are represented in this area, i.e. steel, chemical, rubber, textiles, food etc. There is also a thriving agricultural area around Verviers and Huy.

- Area 10 : Belgian Luxembourg

Apart from the coast, this is one of the principal tourist areas of Belgium, and is often referred to as the Ardennes after the hills or low mountains of that name which lie mainly in it. Practically the entire upland area is covered in forest. There is a small area of industrial development at the southern most part of the province around Arlon, which has extensive steel factories and links up with the great Lorraine steel basin of France.

INDUSTRIAL ORGANISATIONS

- Leading industries in Belgium are:

  - Steel,
  - Non-ferrous metals,
  - Mechanical Engineering,
  - Chemicals,
  - Textiles,
  - Glass,
  - Leather goods and footwear,
  - Diamond industry,
  - the port of Antwerp.

- From the point of view of exporting the most important are:

- Mechanical Engineering,
- Chemicals,
- Non-ferrous metals,
- Steel.

- In 1978, there were approximately 148,000 organisations of all sizes in the country. These enterprises operated from 290,000 establishments. A break-down by industry and size grading (small, medium, large) is shown at Exhibit IV-4.

- The two industry sectors providing the largest number of organisations are:

  - Agriculture/Forestry/Fishing,
  - Wholesale and Retail Distribution.

  The latter industry offers potential for concentration into larger units.

- In 1978 INPUT was engaged to analyse the computer usage of the top 5000 companies in Western Europe. A sample of these companies was from Belgium and Luxembourg. Five hundred and twenty-three (523) were contacted and 345 (66% of the sample) responded by telephone or post to a questionnaire on present and future trends in their EDP usage and buying patterns.

- Exhibit IV-5 indicated the usage of external vendors' processing services in the sample.

- All large organisations are computer users (in-house, external or both) and there are significant indications of a broad move in the direction of increasing user independance. After two decades of centralisation of in-house computing the market will experience an evolution towards decentralisation, not a revolution.

- Decentralisation of computing and increased user independance will be expressed in either of two ways:

DISTRIBUTION OF ENTERPRISES BY SIZE AND INDUSTRY

BELGIUM

ISIC Code	Industry	Enterprise by Size of Annual Turnover (BF)			
		Small <20M	Medium 20M to 2B	Large >2B	Total
11-13	Agriculture/Forestry/ Fishing	63,388	1,330	28	64,746
21-29	Mining/Quarrying	407	292	20	719
31	Food/Drink/Tobacco	2,350	125	14	2,489
32	Textiles/Clothing	1,373	180	8	1,561
33	Wood Products	400	32	5	437
34	Paper/Print/Publ.	465	200	5	670
35	Chem./Petroleum	112	273	40	425
36	Non-Metallic Prod.	3,307	170	17	3,494
37	Basic Metal	53	135	25	213
38-39	Fabricated Metal Prod.	3,037	250	71	3,358
41	Electricity/Gas	-	50	11	61
50	Construction	7,606	352	56	8,014
61-63	Wholesale/Retail	42,255	2,260	170	44,685
71-72	Transport/Comm.	9,508	955	55	10,518
81	Financial	-	150	33	183
82	Insurance	264	50	28	342
83	Business Services and Professions	5,810	226	24	6,060
91	Government	-	132	23	155
	TOTAL	140,335	7,162	633	148,130

SOURCE: INPUT Estimates

EXHIBIT IV-4

1. Distributed data processing (DDP) which is an in-house approach to the re-organisation of computing around the user,
2. User Site Hardware Services (USHS), sometimes called On-Site Computing, which provides the same facility for the user as provided by DDP but with an external source of mainframe and telecommunications support.

- Decentralisation in these two forms will increasingly bring in-house computer departments and external processing services vendors into direct competition for each user requirement. Hitherto, service companies have tended to supplement in-house facilities in areas which have been outside their scope or capacity. In a short time the traditional applications of in-house computing will be opened up - but just this once, and external service suppliers must be energetic and thorough in seeking out the opportunities.

- The large Belgian organisations are unique in Europe for their extreme tendency to contain the maximum proportion of their activities in-house, this being reflected in their low usage of external services. Only 33% of all organisations in the sample use external services - other countries are above 40% and some are considerably higher (e.g. Norway 75%).

- The natural tendency in this market in adopting de-centralisation is to go for the in-house (distributed system) approach. This is not thought an easy option however because 70% of in-house installations are small (up to 10M BF annual expenditure) and only one third have significant experience (i.e. more than 5 terminals) of telecommunications.

- The opportunity which exists for external services vendors is to offer an acceptable and alternative form of de-centralisation. To be acceptable in this market such a service must have all the important user attractions of an in-house system plus some in addition. The customers for such services will increasingly be the user departments whose loyalty to the in-house computer department may well be disturbed.

LARGE ORGANISATIONS' PROCESSING SERVICES USAGE BY INDUSTRY

BELGIUM/LUXEMBOURG

ISIC	INDUSTRY	RESP %'GE	EXTERNAL SERVICES USAGE %				IN HOUSE USAGE %
			ALL	B	RB	I	
11-13	Agriculture/Fishing	-	-	-	-	-	-
21-29	Mining/Quarrying	-	-	-	-	-	-
31	Food/Drink/Tobacco	83	20	17	3	10	93
32	Textiles/Clothing	75	33	22	0	11	89
33	Wood Products	100	50	0	0	50	100
34	Paper/Print/Publ.	88	50	50	7	14	86
35	Chem./Petrol/Coal	67	54	30	7	31	85
36	Non-Metallic Prod.	53	50	25	0	25	75
37	Basic Metai	70	25	19	6	6	81
38-39	Fabricated Metal Prod.	68	38	31	3	8	66
41	Electricity/Gas	100	50	50	0	25	50
50	Construction	61	18	12	0	6	94
61-63	Wholesale/Retail	43	32	29	0	6	87
71-72	Transport/Comm.	80	0	0	0	0	25
81	Financial (Belgium)	64	19	8	2	13	92
81	Financial (Lux)	86	16	0	0	16	89
82	Insurance	63	30	30	0	10	100
83	Business Services	75	50	50	0	0	50
91	Government	-	-	-	-	-	-
OVERALL WEIGHTED AVERAGE		66	33	23	3	14	82

EXHIBIT IV-5

- Not only is the market size for conventional external processing services (Batch, Remote Batch and Interactive) small but the growth prospects are not encouraging:

    1. Batch services demand will decline - the weighted average user estimate of the rate of decline is - 19%.

    2. Remote Batch services will stagnate.

    3. Interactive services will at best stagnate and at worst, if the user estimates are to be taken as a reliable indicator, decline at a rate of -14%.

- In general this market is one of the least rewarding in Europe for traditional external processing services vendors. Since the current market and future prospects for conventional services are not encouraging, some change in market strategy is surely called for. Part of any new strategy should be based on a "combined service". Further alternatives should also be sought to avoid commitment to one new product line alone. The following paragraphs summarise additional readings of market trends which should be taken account of.

- The external service vendors which participate in the development of a new generation of products and services will do so successfully only if they invest sufficiently in well researched and promoted areas. The market will be only partly capable of defining what it requires in the form of new services: the user will be capable of deciding the system requirements but not of determining how those facilities are delivered. It will be up to vendors to make their new offerings fully visible as system products for the end-user.

- The vendors with the best chance of success with a new generation of services will be those which are already both capable of investing properly and which also have sufficient size and enough of the right experience. The leading companies in the market which conform with these requirements are IBM, SLIGOS, and CIG/GTS. These are the current market leaders and all are multi-service vendors.

- The main areas of future applications growth are:

  - General accounting/payroll
  - Financial analysis/planning
  - Production/inventory control

- These are the application areas which will grow through the most attractive computer option available - be it in-house or external. Although users when surveyed, saw the options ranked as follows:

  - in-house centralised,
  - in-house distributed,
  - combined service.
  - conventional service,

  this order of preference is open to influence. Of the three best growth application areas, Financial analysis/planning and Production/inventory control have the best potential in the de-centralised mode.

GROWTH PROSPECTS

- Users' own estimates for the growth of internal services are shown in Exhibit IV-6.

- One would expect a market sector, which is heavily biased in favour of in-house usage, to have a natural tendency to adopt further doses of centralised computing, because of the influence of the management services or DP management. However the growth trend anticipated by users is greatest in distributed systems. This is true even when a single extreme estimate in the sample (causing the peak figure of 103%) is excluded from the calculation.

USER ESTIMATES OF GROWTH - INTERNAL SERVICES

BELGIUM/LUXEMBOURG

MODE	EXPENDITURE RANGE (Belgian Francs)						OVERALL
	<1M	1M - 4M	4M - 10M	10M - 20M	20M - 40M	>40M	
Centralised	+ 3	+ 22	+ 30	- 4	+ 13	+ 11	+ 10.0
Distributed	0	+ 1	+ 3	+ 20	+ 103	+ 24	+ 39.6

EXHIBIT IV-6

- The user estimated growth figure for centralised internal services at 10% is close to the European average (11%). This growth rate is larger in the lower middle expenditure categories. The interpretation of this fact is that these are the installations which have still further upgrade and expansion possibilities within the framework of the conventional batch approach to computing, whereas the bias towards the distributed approach in larger organisations reflects the inability of that approach to provide further cost effective user benefits in future. At the bottom end of the expenditure range (in the lowest grade) the estimates for both approaches are low. This indicates that services vendors with the external services approach will be favoured in this portion of the user spectrum.

- When we turn to the user generated growth estimates for these external services (shown in Exhibit IV-7), the prospects within the large organisations encompassed by our sample appear bleak. Only in Remote Batch processing services is growth at all reasonable. The interpretation of this preference is that Belgian users are traditional, if not conservative, in their computing and many smaller organisations have not been EDP users up to now. The larger spenders with external services vendors now wish to extend their processing into remote sites but are still wedded to the batch approach; whereas the small enterprises, currently at the entry-level stage, still think in terms of the batch approach whether it be off-line Batch or on-line Remote Batch.

- In order to offset the dominance of the large user mentality in any conclusions drawn from this particular sample, we have reworked the estimates for all types of processing services to include all sizes of organisation. The results are shown in Exhibit IV-8. There is a contrast (or conflict) between the overall figures presented in an earlier report last year, and the individual company size category figures. This contrast is greatest in the Interactive services forecasted growth rate.

- Since this work was undertaken in 1978, further indications of the trends in Belgium have come to light during the preparation of INPUT's CAMP/Belgium/Luxembourg directory of computer services companies. There is seen to be a distinct trend towards the use of microcomputers both in User Site systems, and in Turnkey small business systems.

USER ESTIMATES OF GROWTH - EXTERNAL SERVICES

BELGIUM/LUXEMBOURG

SERVICE	EXPENDITURE RANGE (Belgian Francs)						OVERALL
	<100K	100K - 500K	500K - 2M	2M - 5M	5M - 10M	>10M	
Batch	+ 30%	- 19%	- 18%	- 23%	+ 9%	+ 5%	+ 1.3%
Rem. Batch	+ 10%	0%	- 5%	+ 7%	+ 2%	+24%	+13.9%
Interactive	0%	- 1%	- 13%	- 3%	+58%	- 48%	- 11.1%
On Site	0%	0%	0%	0%	0%	+ 3%	+ 1.4%

Note: The percentages under specific expenditure ranges are simple averages of respondant estimates; the "Overall" figures are weighted averages according to expenditure range.

EXHIBIT IV-7

EXTERNAL SERVICES GROWTH BY COMPANY SIZE : OVERALL MARKET

BELGIUM/LUXEMBOURG

SIZE	BATCH	REM. BATCH	INTERACTIVE	ON SITE
Large	+ 1%	+ 14%	- 11%	+ 1%
Medium*	+ 15%	+ 20%	+ 5%	N/A
Small*	+ 25%	+ 5%	+ 5%	N/A
OVERALL[++]	+ 18%	+ 12%	+ 24%	N/A

Notes: * These figures are provisional INPUT estimates, as yet unsupported by statistically significant field research.

[++] Source : "Computer Services Markets in Europe", INPUT, Sept 1978.

o Entirely new user growths not quantified by organisation size are included in the overall figures.

EXHIBIT IV-8

- This trend is due to:

  - the large number of small businesses in the country, who can be most effectively approached by this strategy.

- The Belgian tradionalism has led to a slow growth of on-line business and real-time minicomputer usage. Computing has for long been the preserve of the large batch processor installations. Small business systems have been implemented on Olivetti, Nixdorf and Philips equipment, but these have tended to be single-station machines and have not yet brought the computer closer to the user.

- The preponderance of small organisations has depressed the market for minicomputer-based medium sized business systems. Now with the advent of the microcomputer as the basis for small business systems, there is the potential for data processing to reach down to these smaller users.

C. COMMUNICATIONS FACILITIES

- The Belgian public service authority providing telecommunications facilities is called the Regie des Telegraphes et des Telephones (Regie TT for short). Its headquarters are situated in Brussels. The main contact addresses are given in Appendix F.

- As is the case generally, Belgian users for the most part use the existing telephone network for their data communications requirements. This is so whether the facilities used are point-to-point leased circuits or switched network connections, usually confined to handling slow-speed terminal devices or to providing a back-up facility. Until a public network dedicated to data communications comes available to Belgian companies (and the earliest date given for this is 1980), the Regie TT will endeavour to improve the facilities presently offered.

BELGIAN LEASED CIRCUIT SERVICE ENHANCED BY USE OF TIME DIVISION MULTIPLEXING TECHNIQUES

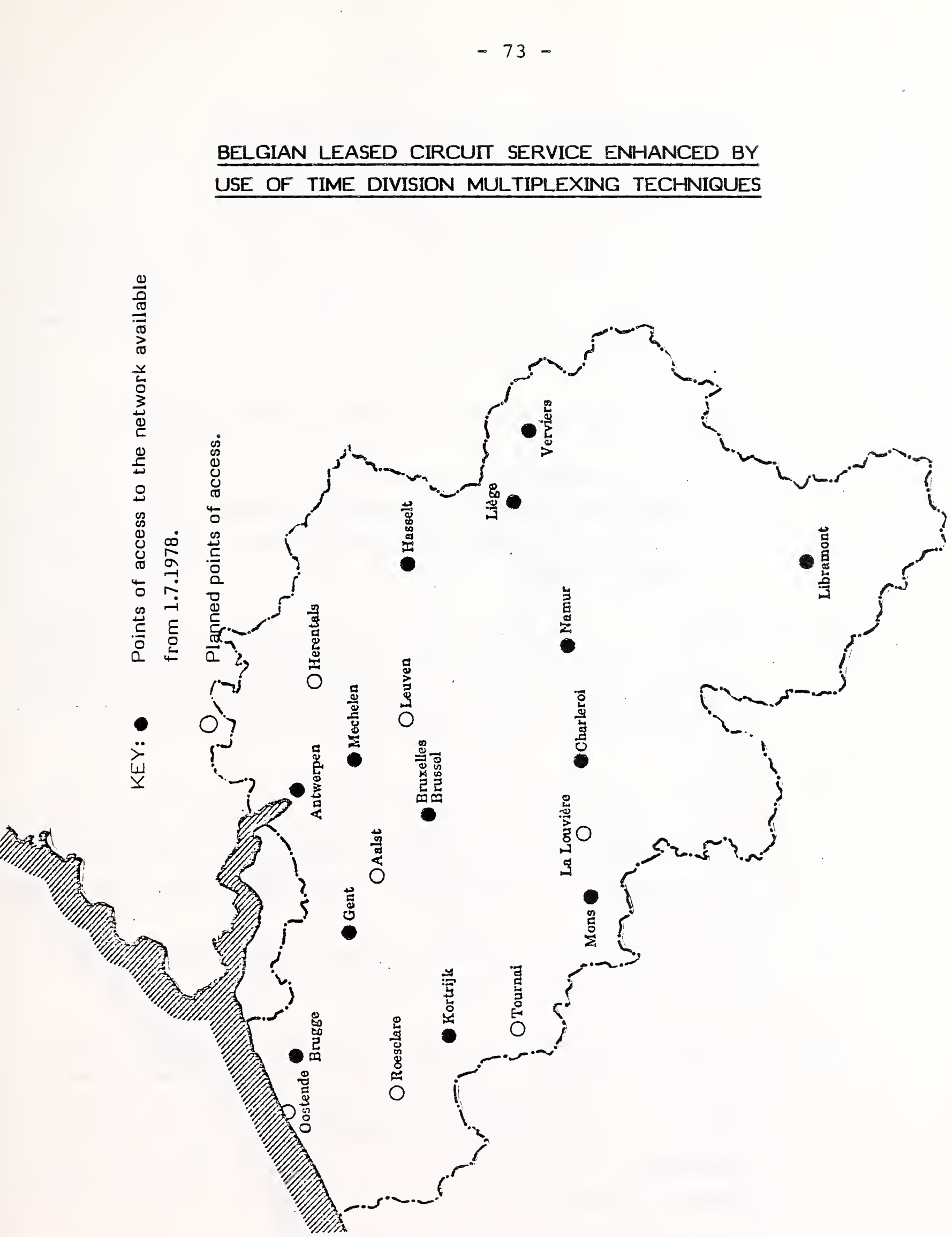


EXHIBIT IV-9

- Work has already started on upgrading the leased circuit service by the use of time division multiplexing techniques. This will consist of the installation of approximately thirty (30) multiplexors in major cities to act as trunk interconnection nodes. A number of phases are planed for this work. The current state of the network for data is shown in Exhibit IV-9.

- Looking to the future, the Regie has examined a number of possibilities:

  - a public packet-switching data network,
  - a public circuit-switching network for telex and data,
  - interconnection to other national data networks,
  - message switching.

- The packet switching technique is favoured for the public transmission of data, and work is in hand to open a public packet-switching network as soon as possible after 1980. Exhibit IV-10 shows the probable siting of the network nodes with three main switching centres at Antwerp, Brussels and Liege.

- The plans for circuit-switching are considerably remoter in time. It is hoped to have an initial service for telex (50 bps) and asynchronous circuits (up to 300 bps) working in the early 1980s and to extend this to other and faster facilities sometime before 1990. Long-term plans are not, however, firm.

- Interconnection to other national networks currently presents problems of equipment compatibility and interfacing.

- The Regie is expected to use the bilateral agreement between two PTTs as the tool for solving the problem of connecting to other national networks within neighbouring countries. Connection to the networks of non-adjacent countries is likely to be made through the EURONET network, assuming this sort of interconnection of networks using possibly different protocols becomes possible with EURONET.

PLANNED BELGIAN PACKET SWITCHING NETWORK

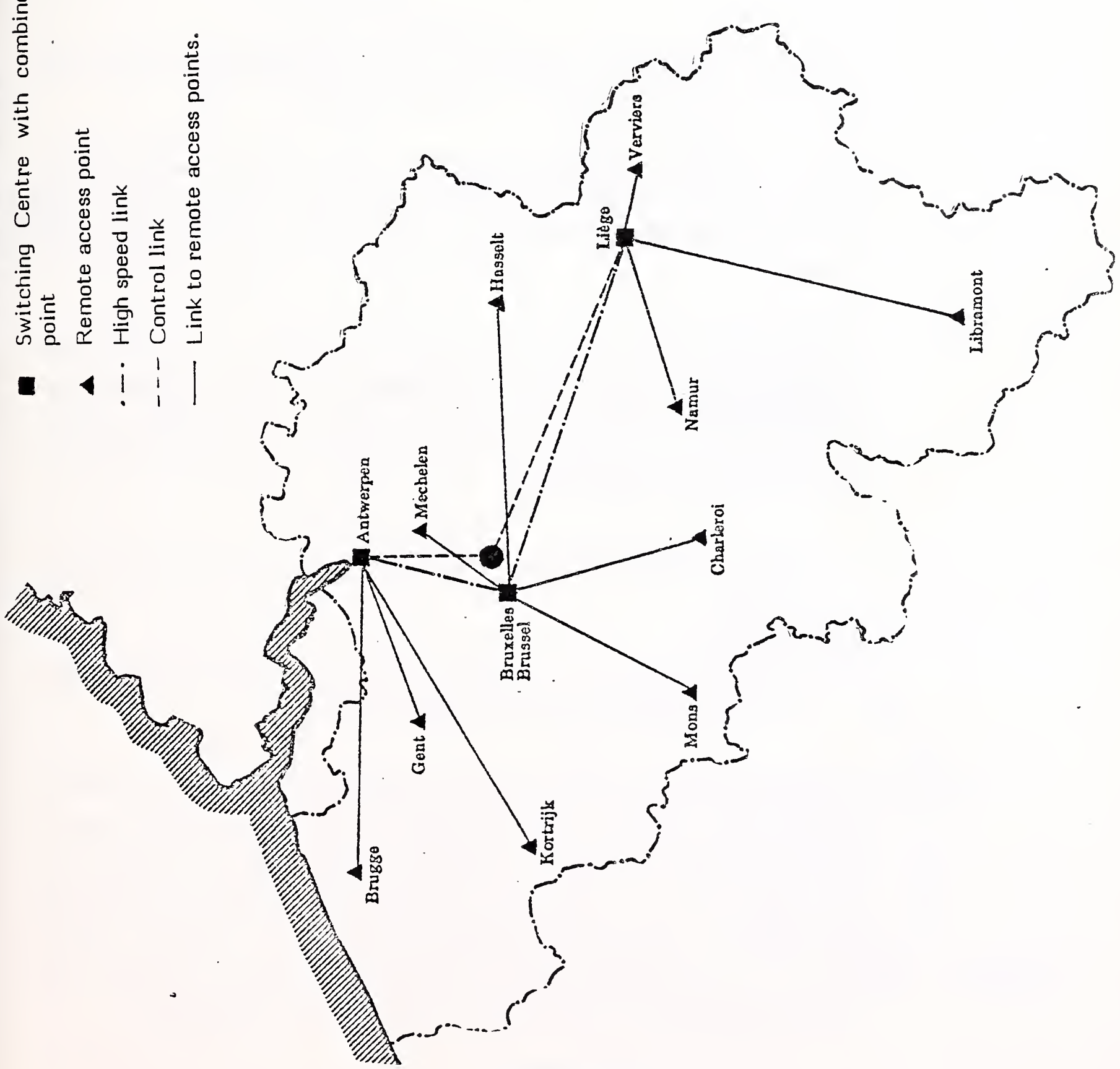


EXHIBIT IV-10

- Message-Switching is seen as a complementary technique to be applied to the requirement for private networks, where mixed telex and data traffic is expected.

D. MARKET SIZE BY TYPE OF SERVICE, 1978

- The Belgian Computer Services Market exceeded the $200 Million level for the first time in 1978, reaching an estimated $201 Million.

- Exhibit IV-11 shows the breakdown of this revenue between Batch Services, Remote Computing Services (RCS) and Software Products/Professional Services; and compares it with the revenue breakdown of the Top Ten service companies.

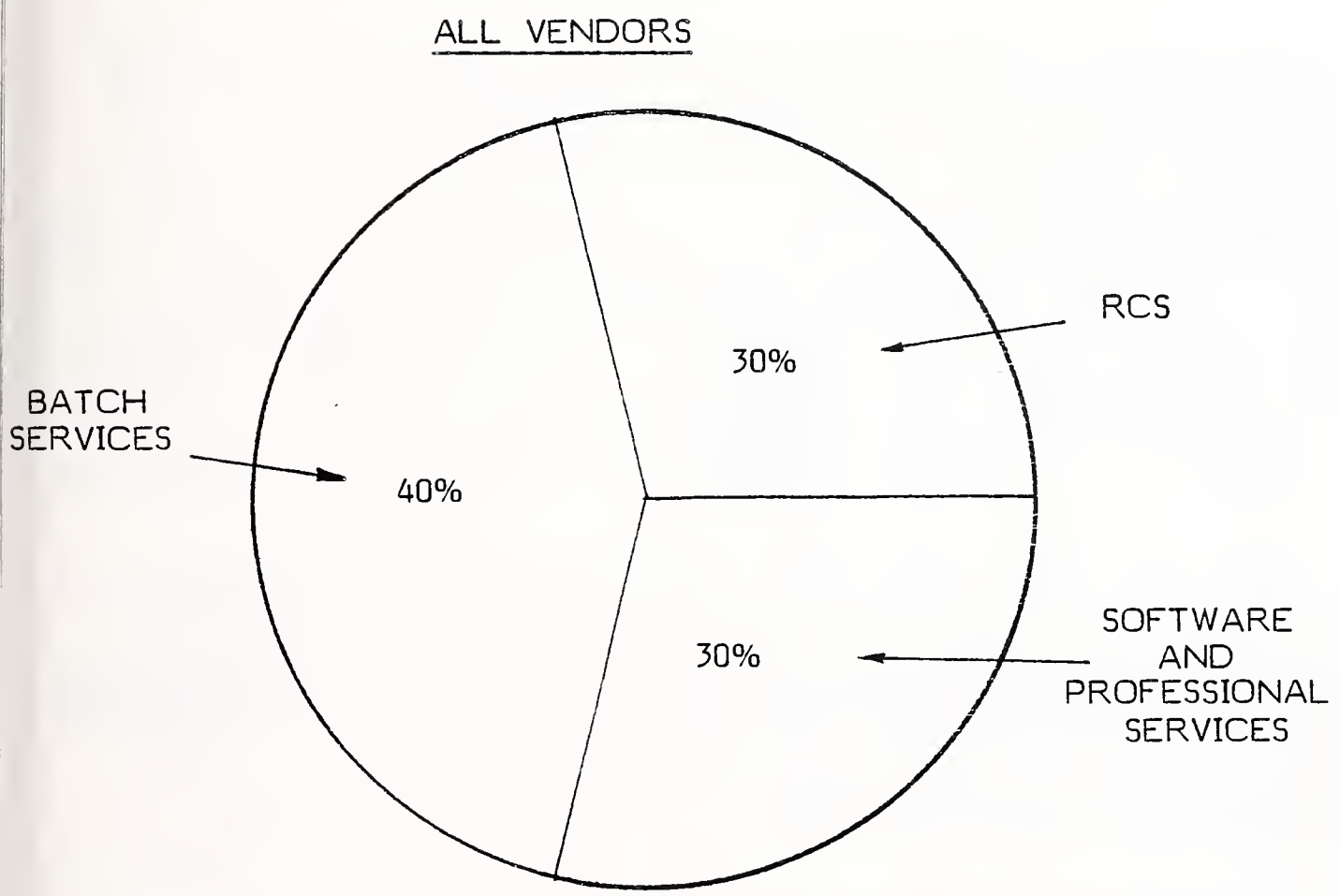
- Whereas Batch Services at 40% is the largest component for the universe of services vendors, among the Top Ten, regarded as a group, Software Products/Professional Services is the most significant with 42% of their revenue. This illustrates two ways in which the large vendors' customers differ from those of the smaller vendors:

  - there is a marked tendency for the larger users to keep their processing in-house,

  - software services and attendant expertise is more credible when purchased from a large, well-established vendor.

- By contrast the small and medium-sized organisations in Belgium prefer to purchase their processing services from the local batch bureau, who is presumably cheaper than his bigger brothers. There is also confirmation for the recently noticed trend towards the adoption of micro-based small business systems, by both small and large services vendors in the country. (This is included in the figures as a part of Professional Services). This trend was given prominence in the 1979 COMPEC Europe exhibition in Brussels.

THE BELGIAN COMPUTER SERVICES MARKET 1978



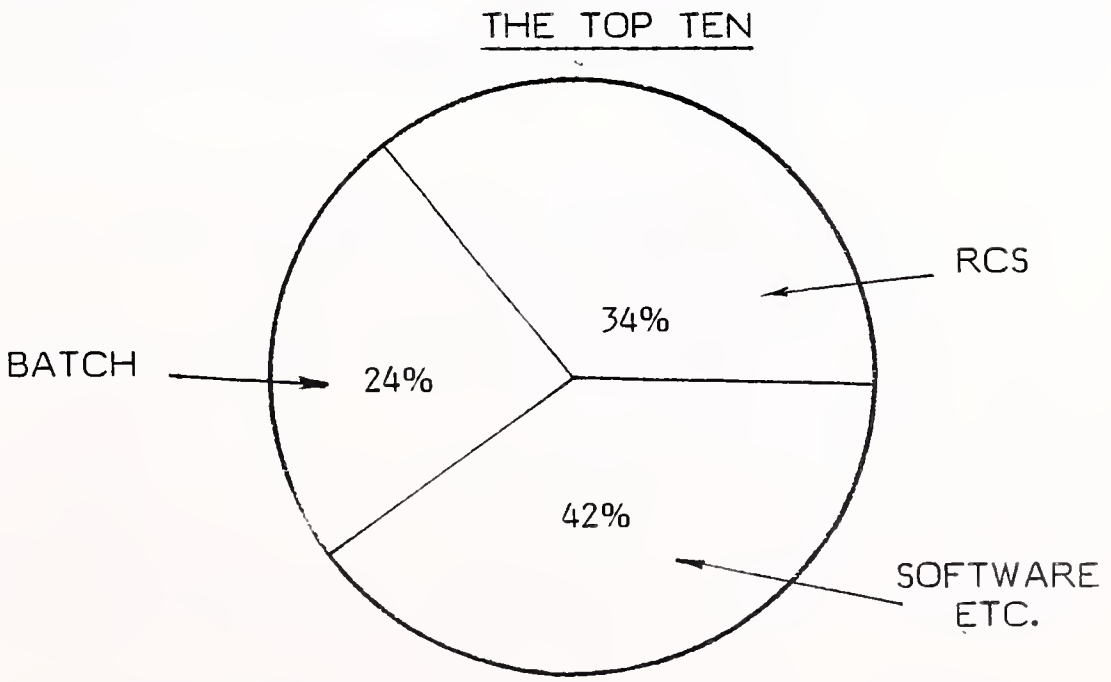


EXHIBIT IV-11

E. COMPETITION AND VENDOR MARKET SHARES

- Per head of population the Belgian market is very well served with computing services vendors - 203 for a population of just under ten (10) million.

- Another indicator of the teeming nature of the services market here is the vendor revenue per head of population, which comes out at $20.2 for 1978. This figure is higher than that for any of the major European countries' markets, except France.

-	France	-	$23.72
-	West Germany	-	$15.34
-	UK	-	$12.61
-	Italy	-	$10.58.

Of course one must remember that costs and selling prices in Belgium are among the highest in Europe, and the figures quoted need strictly speaking to be compared on some indexed basis. Nevertheless, we can say that the Belgian market is as active as other European markets, taking approximately 3.7% of the total revenues in Western Europe.

- Of the 203 vendor companies, the systems and software houses and consultancies form just over 50% with 109 enterprises against 94 organisations whose main activity is a processing service of some kind, whether batch, RCS or data prep.

- An analysis of the vendor population derived from INPUT's CAMP/EUROPE database is shown in Exhibit IV-12. This table gives the distribution of vendor companies by size groups and principal activity. Four size groups are used:

- Group Code A had annual turnovers (77-78) greater than $10M,
- Group Code B had annual turnovers between $10M and $1M,
- Group Code C had annual turnovers between $1M and $0.1M,
- Group Code D had annual turnovers less than $0.1M.

DISTRIBUTION OF SAMPLE COMPUTER SERVICES COMPANIES IN BELGIUM BY 1978 TURNOVER AND PRINCIPAL ACTIVITY

US $

MAIN ACTIVITY \ TURNOVER CODE	>10M A		10M - 1M B		1M - .1M C		≤0.1M D		ALL WITH T/O		SAMPLES as % of TOTAL POPN.	
RCS BUREAU	1	0.6%	7	4.3%	7	4.3%	-	-	15	9.3%	71% of	21
BATCH BUREAU	1	0.6	11	6.8	22	13.7	6	3.7	40	24.8	77%	52
SOFTWARE AND PROFESSIONAL SERVICES	-	-	9	5.6	45	27.9	38	23.6	92	57.1	84%	109
OTHER (EG COM, DATA PREP.)	-	-	1	0.6	4	2.5	9	5.6	14	8.7	67%	21
ALL WITH T/O.	2	1.2	28	17.4	78	48.4	53	32.9	161	100	79%	203

EXHIBIT IV-12

The total vendor population in the database exceeds the number with a stated or estimated turnover. A hundred and sixty-one companies could be attributed an annual turnover, and this was 79.3% of the total population. (As a sample it proved large enough to extrapolate revenue figures for all company groups).

- Examination of the population by size groups shows, as one would expect, a preponderence of small and very small companies - Codes C and D. This type of enterprise is exceedingly common in all industries in Belgium and is indicative of the entrepreneurial nature of the Belgian business community.

- Exhibit IV-13 shows the revenue breakdown of the Top Ten vendors by the three major categories of service type. The table is headed by CIG a large national group. Second and third are two multi-national companies, one US, one French - IBM and SLIGOS respectively. Fourth position is occupied by ORDA-B. Except for GTS, CDC and Steriabel the rest of the table is dominated by national software houses.

- If one analyses the suppliers' ranking according to major class of service, IBM is again top of the league in two out of three classes. This type of ranking is shown in Exhibit IV-14.

- There are twenty-one (21) different companies included among the top ten of each of the three service types. The world-wide multi-nationals dominate the RCS ranking, but national companies with a sprinkling of European multi-nationals are mostly in evidence in the other two classes.

- The Top Ten companies accounted for $85.4 Million or just over 42% of the total market for 1978.

F. COMPARISON OF VENDOR MARKETING STRATEGIES

- Belgium has tended to be classical in its approach to computing, applying well-tried techniques in both the commercial and the operational aspects of its services businesses.

EXHIBIT IV-13

THE TOP TEN COMPUTING SERVICES VENDORS BELGIUM/LUXEMBOURG 1978/79

SOURCE: CAMP/EUROPE

RANK	VENDOR	REVENUE IN MILLIONS OF BELGIAN FRANCS (MBF)			
		BATCH	RCS	SOFTWARE & PROFESSIONAL	ALL SERVICES TOTAL
1	CIG	273	200	287	760
2	IBM	153	261	41	455
3	SLIGOS	109	61	140	310
4	ORDA-B	52	82	66	200
5=	SOBEMAP	—	—	180	180
5=	GTS	—	180	—	180
7	CDC	34	119	17	170
8	STERIABEL	—	—	168	168
9	SGAB	48	16	96	160
10	EFFICIENT SA	—	—	150	150

EXHIBIT IV-14

TOP SUPPLIER RANKING BY SERVICE TYPE
BELGIUM/LUXEMBOURG 1978/79

BATCH SERVICES	REMOTE COMPUTING SERVICES	SOFTWARE & PROFESSIONAL SERVICES
CIG	IBM	CIG
IBM	CIG	SOBEMAP
SLIGOS	GTS	STERIABEL
AIM	CDC	EFFICIENT SA
CIM	ORDA-B	SLIGOS
ORDA-B	SLIGOS	CEDEC
SGAB	UCC	SGAB
REK. SECUREX	CEVI	CAP-GEMINI
ANPROPER	ADP	ORDA-B
GERAC	COMSHARE	CINCOM
CEVI	CIM	UCC
COMECAN SA	SIA	IBM
	SGAB	REK. SECUREX
	CEGOS-TYMSHARE	FIDUCIERE
		CEVI

SOURCE: CAMP/EUROPE

- Some reasonably large national companies have emerged as a combined result of acquisition and natural growth. Notable examples are:

  - CIG,
  - ORDA-B.

- Multi-nationals both US and European have taken an interest in Belgium not only for its own home market potential, but also for the position of Brussels as the 'capital' of the EEC. IBM is well established as the leading equipment supplier; CDC has just completed installation of satellite communications equipment in Brussels to make the Brussels centre the main European node interfacing to the transatlantic trunking line; SLIGOS has extended its bureau operations into the French-speaking southern half of the country.

- Appendix C contains profiles of a range of service companies in Belgium:

  - vendors of different types of service are included, as are also
  - vendors of different sizes.

V. THE MARKET IN LUXEMBOURG

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The Grand Duchy of Luxembourg covers an area of exactly 999 square miles and has a population of some 350,000 inhabitants. There is a dialect spoken by more than two thirds of the population, Letzeburgesch, but it is not generally used as a written language. The people are great linguists and English and French are understood and spoken by almost everyone.

Belgian money is accepted in Luxembourg. The main source of income comes from: mining, blast furnaces and steel works, which are concentrated around Dudelange in the south-west corner of the Duchy and constitute 70% of all exports. Other sources of income are agriculture and wine.

Luxembourg is a tax haven and the Secretariat of the European Parliament is based in the capital and for 3 months of the year the Council of the Ministers of the European Community meet here.

A. ECONOMIC STRUCTURE

- The standard of living and its cost are both high in the Grand Duchy. The per capita GDP is slightly higher than that of Belgium, - 280,000 Francs per head as against 265,000 in Belgium.

- Nevertheless the country is too small to contribute significantly to the overall Benelux computer services market.

- Exhibit V-1 illustrates the main economic indicators and their movements in the last 8 years.

B. USER CHARACTERISTICS AND REQUIREMENTS

- The main manufacturing industries are:

  - Steel,
  - Chemical Products,
  - Agriculture etc.,
  - Building.

- Besides these, in the services sector, there is a healthy segment in Banking and Insurance.

- The main computer users are:

  - in manufacturing . steel mills
    . chemical firms,
  - in services . banking and financial institutions.

- Luxembourg's development in application areas is about average for Western Europe, with no particular highlights.

C. COMMUNICATIONS FACILITIES

- Public switched data communications facilities are available via:

  - telephone network, and telex.
  - Leased lines are also available.

- The PTT Administration does not supply modems, teleprinters nor data transmission equipment. These have to be purchased from approved proprietary sources.

BASIC ECONOMIC STATISTICS

LUXEMBOURG

INDICATOR	YEAR		
	1970	1974	1978
GDP FB	53	94	98
Population (millions)			
- Total	0.34	0.35	0.36
- Total Working	0.14	0.15	0.15
Agriculture, etc.	0.01	0.01	0.01
Manufacturing	0.06	0.07	0.07
Service Industries	0.06	0.07	0.07
No. of organisations * (thousands)	-	-	5
No. of establishments * (thousands)	-	-	11

* These figures include the numbers engaged in agriculture, forestry and fishing.

SOURCES: Luxembourg M.E.N. and INPUT estimates

EXHIBIT V-1

- The Administration is considering the introduction of a public packet switching network. At the present time access to Euronet and other database networks may be made through the public switched telephone network.

D. MARKET SIZE BY TYPE OF SERVICE, 1978

- The market in 1978 consisted of $6M of which:

  - Batch Services took 45%
  - RCS 32%
  - Software and Professional 23%.

E. COMPETITION

- Three companies have been identified as sharing the bulk of the Luxembourg market:

  - IBM Belgium,
  - Centre de Gestion,
  - Sterialux.

- The second of these is a national service bureau, while the third is part of the French Steria group and has an associate in West Germany.

VI. FUTURE DEVELOPMENTS

VI. FUTURE DEVELOPMENTS

A. FACTORS AFFECTING MARKET GROWTH IN THE BENELUX COUNTRIES

- The major driving forces in the computing industry, and its allied areas of information processing, remain today as before:

  - the need for immediately available data-processing facilities to end-user personnel - the "ultimate users",
  - the ever-decreasing cost of technology.

- However in the two major Benelux countries, Holland and Belgium, the pressures on their economies have produced a challange and a corresponding response; and this has been a contributory factor in the continued good growth in both. Here we are looking at the two countries in the world which more than almost any other need to export to live, and we are looking at them in the post-1974 oil-crisis period.

- The form, in which the response to this challenge has manifested itself, has been a significant improvement in the quality of management. The awareness of the potential of information processing has played a large part in:

  - this resurgence of their economies, generally,
  - the continued expansion of all sections of the DP industry.

- New factors, which have recently entered upon the scene, will continue increasingly to influence growth in the five year forward period:

  - opening up of the office products field to the use of intelligence -driven devices,
  - commissioning of viewdata services in major countries,

- sharper definition of what is meant by 'personal computing', and its classification into different sectors,
- increasing respectability for systems and software companies as turn-key implementation of small business systems gains in user demand,
- realisation on the part of equipment vendors of the revenue earning capability of field maintenance,
- more visible use of alternative distribution channels as manufacturers face the increasing cost percentages of sales and sales support.

- It all adds up to a bright future for the mixed services vendor groups, since:

  - pure services vendors now need to take greater notice of equipment possibilities e.g. the move into USHS for a processing services vendor,
  - pure equipment vendors equally need to look to the yields of their service department in terms of profit rather than cost centres.

- For different types of services vendor, future development may be retarded by one or more factors:

  - processing services vendors have less flexibility for short-term changes of posture because of their need to capitalise on previous central hardware investment,
  - third-party maintenance (TPM) companies are still at an early stage of development without many established reputations to point to.

- On the other hand:

  - systems and software houses still in the main suffer from a lack of investment finance for productising of previous system products, and no in-house capability in the hardware maintenance area.

B. IMPACT OF HARDWARE MANUFACTURERS' STRATEGIES

- The recent spate of IBM announcements for DDP (8100 series), mainframe replacement and replication (4300 series) and work-station oriented business systems (System/38) has shown the giant opening a new chapter in the story of the DP industry. For some years now IBM has been seen to be neglecting hardware technological advance, while at the same time increasing its capabilities and revenues by producing further software products to enable larger configurations of existing mainframe ranges to be sold. This has all changed dramatically in 1979 with the advent of 4300 which has set a new standard for hardware price/performance for mid-range mainframe users - IBM's traditional major market sector.

- IBM is, however, suffering from self-impact due to the variety of products and solutions which it is currently offering. This is felt most in the GSD product range where IBM's name is not so strong as to automatically penalise the European competitors like ICL, Philips and Nixdorf all of whom report good SBC sales Europe-wide.

- DEC, the mini market leader, is in a different position. Having sold through OEM houses since its inception, it is now finding it difficult to establish an equally strong end-user sales force, and is thus faced with the risk of remaining 'at the mercy' of its large OEMs to an unacceptable degree. DEC is now examining the encapsulation of hardware/software micro-based products as a means of breaking this real, or potential, stranglehold.

- Other successful mini markers - DG, Prime and Hewlett-Packard - have established a better balance of business between OEM and end-user sales.

C. IMPACT OF RECENT PRODUCT ANNOUNCEMENTS

- The most influential announcement this year has been that of the 4300 Processors from IBM. Other major announcements of interest to services vendors have all followed IBM's strategy (NCR, Burroughs) or attempted to preempt it (Prime, H-P). The only major announcement of the last 12 months which is independent of IBM's stance is that from DEC:

  - of the VAX 11/780 maxi-mini.

- Though 4300 range poses both a threat and an opportunity to the services industry, the opportunity is greater than the threat.

- The threat is present because:

  - IBM aims to sell 4300 directly to end users as "application machines"
  - besides reducing the involvement of the DP department this policy lessens the users requirements for software support.

  Because of the absence of new application software for distributed data processing, and the relatively undeveloped usage of DB/DC in Europe, this threat is more imaginary than real.

- With multiple host processors in an organisation, the user is going to need lots of expertise to tie together and control the spread of data processing closer to his day-to-day operational fields.

- The opportunity for the services vendor hangs on the IBM name. The pricing of 4300's makes them good replacement machines for 360/370 in service bureaux but there is the added attraction of turnkey OEM sales on equipment with the IBM label. Though IBM will not offer discounts on 4300 at this stage, we may expect to see a change in policy on this question within two years. At least the precedent for volume discounts has now been set in the US on the Series/1.

- The other major attraction for services vendors is that 4300 is designed as a remote site machine:

  - no system software generation is needed when taking an IPO/E
  - on-line database reduces operator disk handling
  - small configurations don't require air conditioning.

  With the increasing awareness of the possibilities for on-site computing, 4300 must be evaluated carefully by prospective entrants to this field.

- Specific consultancy/training opportunities exist for service companies in:

  - user planning and support consultancy
  - user education by tutorial/workshop sessions to develop their self-sufficiency
  - user training in individual industry-oriented products.

- Software opportunities comprise:

  - maintenance and enhancement of obsolescent/unsupported IBM software
  - adaptation of existing application programs/products to make use of new 4300 features
  - production of system software (DBMS, interactive tools etc) to outperform IBM's offerings
  - conversion and rewrites for 370 systems.

- Opportunities involving 4300 hardware sales include:

  - Facilities management by 370 replacement at a reduced DP budget
  - Off loading of central DP loads onto 'on-site' 4300

- 'On-site' cluster supervisory systems, where a 4300 handles satellite minis in distributed mode
- large scale turnkey systems for specific industries, e.g. POS controller for discount warehouse or multiple store
- joint turnkey sales with IBM.

D. IMPACT OF NEW SOFTWARE TECHNIQUES

- Two major improvements in software production methods stand out from the otherwise rather dull and flat 'landscape' of software implementation over the last five years:
  - the use of interactive program development aids,
  - the parameter-driven techniques coupled with the use of a kernel table-processor.
- The impacts on the market-place of these two changes are different.
- On-line program development as a standard is of great value to the processing services vendor from two angles:
  - as a revenue earner,
  - as a cushion against the requirements for user hand-holding and support.
- IBM has recognised this major change in withdrawing the name DCS from its service bureau operation. IBM now only offers RCS, terminal-based services, in order to minimise its support commitment. Coupled with such an approach, however, is the need to invest continually in up-to-date development aids. In this aspect, can the independents match IBM?

- The importance of the parameter-driven table-processor is in the ability it affords systems houses to steer a middle course between:

  - the complete one-off software system,
  - the over-generalised all-embracing package.

  INPUT believes this approach will allow these companies to offer cost-effective software solutions for the next five years. Vendors without such techniques will find their margins under severe pressure.

E. IMPACT OF LONGER-TERM USER TRENDS

- The role of Personal Computing will gain prominence in the five-year period as a factor affecting all types of services vendor.

- One of especial importance to processing service companies is the use of small-scale dedicated computers by "ultimate users" in large firms.

- These new dedicated computers offer immediate accessibility, can be operated by one user in a standalone mode or as a terminal, and cost less than $10,000 (sometimes much less). They may be dedicated to a single application or may perform a variety of applications for the same user.

- The ultimate user is the manager or professional who uses computer-supplied information in the performance of his job. He is the person presently served by an in-house EDP function or by outside computer services vendors. He now has the third option of obtaining his own dedicated machine at a price he may be able to afford out of his own budget.

- Corporate management in general, and EDP managers in particular, are now in the process of deciding what role they should play in the distribution and support of these new machines to the professional and managerial employees of their companies. The outcome of the decisions they make now may significantly influence the future course of the data processing industry.

VII. APPENDICES

A. Definitions

B. Vendor Profiles in Holland

C. Vendor Profiles in Belgium/Luxembourg

D. Exhange Rates

E. Netherlands PTT Addresses

F. Belgian PTT Addresses

APPENDIX A: DEFINITIONS

- A Small Business Computer, for the purpose of this study, is a system that is built around a Central Processing Unit (CPU), and that has the ability of utilizing at least 20M bytes of disk capacity, provides multiple CRT work stations, and offers business-oriented system software support.

- A Systems House integrates hardware and software into a total turnkey system to satisfy the data processing requirements of the end user. It may also develop system software products for license to end users.

- A Turnkey System is composed of hardware and software integrated into a total system designed to fulfill completely the processing requirements of one or more applications.

- An End User may buy a system from the hardware supplier(s) and do his own programming, interfacing and installation. Alternately, he may buy a turnkey system from a manufacturer, systems house or hardware integrator.

- A Hardware Integrator develops system interface electronics and controllers for the CPU, sensors, peripherals and other ancillary hardware components. He may also develop control system software in addition to installing the entire system at the end user site.

- A Small Business Computer Manufacturer builds its system around a proprietary CPU and provides systems software. It may make or buy peripheral equipment and semiconductor devices. Distribution to the end user may be through its company field sales offices, a network of distributors, or both.

- A Distributor purchases the small business computer on an OEM basis from the manufacturer and markets it to the end user. He may or may not provide a turnkey system.

- Peripherals include all input, output and storage devices (other than main memory), which are locally connected to the main processor and are not generally included in other categories, such as terminals.

- A Minicomputer is usually a 12-, 16-, or 18-bit computer which is provided with limited applications software and support and may represent a portion of a complete larger system or network.

  The larger Minicomputers (often with 24- or 32-bit architecture) are sometimes called Midicomputers; they have the power of a small mainframe and are often used stand-alone for specialist applications.

- Distributed Data Processing (DDP)

  - INPUT was unable to find a consensus among both users and vendors as to a definition of DDP. It appears to be a concept that is uniquely structured to satisfy individual vendor and user requirements.

  - Nonetheless, as a result of extensive work in this area, INPUT offers the following hybrid definition:

    "Distributed processing is the deployment of programmable intelligence in order to perform data processing functions where they can be accomplished most effectively, through the electronic interconnection of computers and terminals, arranged in a telecommunications network adapted to the user's characteristics".

- Computer Services are services provided by vendors that perform data processing using vendor computers or assist users to perform such functions on their own computers.

- Processing Modes are of three types: Facilities Management, Remote Computing Services, and Batch Services.

- Facilities Management (FM) is the management of all or part of a user's data processing functions under a long-term (not less than one year) contract. To qualify, the contractor must directly plan and control, as well as operate, the data processing facility provided to the user on-site through communications lines, free-standing or in mixed mode. Simply providing resources, even though under a long-term contract and/or for all of a user's processing needs, does not qualify as FM.

- Remote Computing Services (RCS) are the provision of data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. The three sub-modes of RCS are:

  o INTERACTIVE (Time-sharing) is characterized by interaction of the user with the system, primarily for problem solving time-sharing, but also for data entry and transaction processing - the user is on-line to the program/files.

  o REMOTE BATCH is where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.

  o DATA BASE is characterized by the retrieval of information from a vendor-maintained data base - this may be owned by the vendor or a third party.

- Batch Services include data processing performed at vendors' sites on user data which has been physically transported (as opposed to electronically by communications lines) to those sites. Data entry and data output services, such as OCR or COM processing, are also included.

- Processing Services encompass FM, RCS and Batch Services: They are categorized by type of service, as distinguished from mode to service, bought by users, as follows:

- GENERAL BUSINESS services are processing services for applications that are common to users across industry categories. Software is provided by the vendor; this can be a complete package, such as a payroll package, or an application "tool", such as a budgeting model, where a user provides much of the customizing of the finished product it uses. General business processing is often repetitive and transaction oriented.

- SCIENTIFIC AND ENGINEERING services are the processing of scientific and engineering problems for users across industries. The problems usually involve the solution of mathematical equations. Processing is generally problem solving and is non-repetitive, except in the sense that the same packages or "tools" are used to address different, but similar, problems.

- SPECIALTY APPLICATIONS services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or an application "tool" that the user employs to produce its unique solution. Specialty applications can be either business or scientific in orientation; data base services where the vendor supplies the data base and controls access to it (although it may be owned by a third party) are also included under this category. Examples of specialty aplications are: Seismic data processing, numerically-controlled machine tool software development, and demand deposit accounting.

- UTILITY services are those where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

- On-Site Computing (or Combination Processing) is a relatively new type of service which consists of offering a mixed solution to a user's requirements, comprising:

  - Remote Computing on a vendor's mainframe for applications best suited to mainframe power.

  - Installation of On-Site Hardware - usually comprising a minicomputer or small mainframe at the user's site for local processing of applications best performed on a local machine.

  On-Site hardware may be supplied on a turnkey or OEM basis; it acts as the terminal or terminal cluster controller for the remote computing part of the service.

- Professional Services include management consulting related to EDP, systems consulting, systems design and prgramming and other professional services, e.g. education and training. Services can be provided on a basis of: "Time and Materials", whereby the user pays for the time used of an individual on a daily or other fixed rate, or "Fixed Price", where the user pays a fixed fee for a specific task or series of tasks.

- Software Products are systems and applications packages that are sold to computer users by equipment manufacturers, independent vendors, and others. They include fees for work performed by the vendor to implement a package at the user's site.

B. VENDOR PROFILES IN HOLLAND

B.1 PROCESSING SERVICES VENDORS

a. ADP BENELUX

b. ADP-NIS

c. COMPUTER SERVICE HOLLAND

d. EAR

a. **COMPANY HIGHLIGHT**

ADP BENELUX B.V.
Diergaardesingel 68 - 70
Postbus 1288
3000 BG Rotterdam

TEL: 010 - 132320

C. van den HERIK
Managing Director
Turnover f 15,000,000 (30.6.79)
Staff - ADP BEN: 120
Staff - ADP NIS: 60

THE COMPANY

- ADP Benelux B.V. formerly I.E.A. (Instituut voor Elektronische Administratie) was acquired by ADP Computing Company in 1974 and operates in the Benelux as the commercial service of ADP. ADP Network Services International operates from Rijswijk which is near The Hague in Holland and was founded in 1973 and is the Dutch centre for ADP's international network.

KEY PRODUCTS AND SERVICES

- ADP Benelux specialise on the basis of offering standard-programs at fixed price tarifs. The standard programs cover the following fields:

  - Stock control
  - Financial administration
  - Payroll/Personnel records
  - Direct Marketing
  - Real estate/Business services
  - Building industry (special program)
  - Subscription/Medical registration

- These programs have been sold to the following industry sectors:

  - Food/Drinks Tobacco Manufacturers
  - Textile/Clothing/Footwear
  - Wood Products
  - Paper Manufacturing/Printing/Publisning
  - Oil/Chemical/Coal/Plastic Products
  - Wholesale/Distribution
  - Construction/Building industry
  - Banks/Insurance
  - Transport/Storage
  - Education/Research/Medical

- ADP offer the following services i.e.:

  - Batch Processing
  - Remote Computing
  - Turnkey Systems

COMPUTER HARDWARE

- IBM 370/145
  CDC 1700
  OLIVETTI 525

b. **COMPANY HIGHLIGHT**

ADP/NETWORK SERVICES INT.
3.c Van Markenlaan 3.
Rijswijk

TEL: 070 948962

B. Tyther Leigh (London)
Total Sales 1977: Est. $1.8M
Total Sales 1978: Est. $2.4M
Staff : 60

THE COMPANY

- ADP/NETWORK Services, a wholly owned company of ADP INC; with offices at Rijswijk (The Hague), Amsterdam, Rotterdam and Eindhoven and the Head Office in London.

KEY PRODUCTS AND SERVICES

- Time Sharing
- Payroll
- Inventory Control
- General Accounting

INDUSTRY MARKETS

- ADP specialise in the fields of Banking and Finance and the manufacturing industry and in wholesale and retail distribution areas. They market a wide variety of packages in these fields including:
  - IPL
  - FINALYST
  - CYPHERTAB
  - BUDGET
  - ORACLE
  - TSAM
  - CPMS

COMPUTER HARDWARE

- 14 x DEC System 10.

c. COMPANY HIGHLIGHT

COMPUTER SERVICE HOLLAND B.V.
Wijnhaven 22
Postbus 2085
Rotterdam

TEL: 010/11.44.20

Managing Director
K.W.A. ENGELBRECHT
Turnover: f 6.3M
Year ending 31/12/78
Staff: 60

THE COMPANY

- Computer Service Holland started as the internal data processing department within Hudig and concerned itself with the internal requirements of that organisation.

- Subsequently Hudig and Langeveldt merged into Hudig Langeveldt N.V., and in 1970 outside consultants recommended that the computer operations of both should be hived off as a separately accountable operation.

- Hudig Langeveldt is the sole present shareholder in Computer Service Holland.

- Until 1970 Computer Service Holland was run by a programmer and an accountant. Predictably the consultants recommended that a mature business manager was required. Mr. Engelbrecht was subsequently hired and has managed the business since.

KEY PRODUCTS AND SERVICES

- Computer Services Holland is a services bureau, and, latterly an emergent turnkey system company which has good development potential. Currently the internal structure resembles that of an in-house computer department; this is to be expected of a company with 70% captive revenue.

- The major part of the workload is concerned with the accounting, billing and policy administration for the non-life insurance activities of the parent company. The state of systems development is advanced compared with their competitors in Holland and elsewhere; prospects for external sales are quite promising.

- In addition the company has 15 years of experience in stock control and has generated an increasingly significant level of business with third party clients. This has been developed with companies in the wholesale industry.

- A stock control and accounting suite of programs have been developed for the MAI Basic 4; these are being offered by MAI under agreement with Computer Service Holland.

THE HARDWARE

- Hudig started data processing with a Hollerith unit record machine. The first computer was an IBM 1401 which was also the first machine in Computer Service Holland; this was followed by a Honeywell 1200 and then the present Siemens 7.700 series in 1970. There are now 2 Siemens configurations:

  - 7.738 with 1MB of main store
  - 7.730 with 384 KB store.

- There is also a MAI Basic 4 installation for Small Business System software development.

PRODUCT AND MARKETING STRATEGY

- The objective of the company is to achieve a 50/50 balance of internal and third party revenue over the next three years. The main thrusts will be made in re-sale of insurance software and the sale of mini based stock control and accounting packages.

- No specific external marketing or sales function exists.

d. **COMPANY HIGHLIGHT**

ELECTRONISCH ADMINISTRATIECENTRUM
ROTTERDAM B.V. (EAR)
Groothandelsgebouw B3
Stationsplein
45 Weena 695
Rotterdam

TEL: 010/11.95.88

Managing Director
G.J. DRESSELHUIZEN
Turnover: f 3.5M
Year ending 31/12/78
Staff 35

THE COMPANY

- In 1967, G.J. Dresselhuizen left IBM and joined a service bureau. After two years, he decided to set up on his own and began as a consultant. A contract with a glass/porcelain wholesaler and distributer led to him taking over the company's computer installation and turning it into a service bureau. Two brothers (F.A. and R.A. Haubrich) who own the glass/porcelain business retained control.

- The business developed steadily with a growing specialisation in computer applications for Wholesaling and Distribution. More recently (within the last three years) a new service has been developed for retailers.

- The authorised Capital is f 100,000 and the issued capital is f 90,000 (fully paid up).

- F.A. and R.A. Haubrich hold 80% of the shares and Dresselhuizen has the other 20%.

- Apart from a good spread of batch applications, two applications directed at two of the big growth areas in data processing appear to be in a highly developed form. The first of these, an on-line package for Wholesale/Distribution companies, is in its second generation of development. The second and newer package provides an accounting and information system to support retail point of sales terminals.

KEY PRODUCTS AND SERVICES

- The major two packages are TOVAS (Wholesale and Distribution) and DETAS (Retailing). TOVAS consists of 200 programs and has been recently rebuilt. DETAS is also a substantial suite of programs.

- The TOVAS and DETAS applications packages incorporate excellent principles of design and TOVAS operates as a real-time system using Burroughs COBOL and FORTE for file management. These packages are right in the mainstream of two big growth areas for data processing.

HARDWARE

- Today, the mainframe installation is based on a Burroughs B3700 x 400 KB processor with two printers, 130 Mb of disk storage, 8 tape drives, a card reader and a paper tape reader.

- There are 40 terminals on-line installed in Holland including TC3500's and one B80.

- The equipment is due for upgrade to a twin-processor configuration in 1979.

B.2 SOFTWARE/PROFESSIONAL SERVICES VENDORS

a. ARSYCOM

b. NOVA AUTOMATION CONSULTANTS

a. **COMPANY HIGHLIGHT**

ARSYCOM B.V.
43-47 Kabelweg
Amsterdam
The Netherlands

TEL: 020/82.38.58

Managing Directors
I.R.F. van der Walle
D.A. Schwartz
Turnover: f 30M (Est.)
- Year 1977/78
Staff: 120

THE COMPANY

- ARSYCOM originated from a small group working on scientific problems in the Aerospace industry. Trading formally began when the company was formed in 1973. Initial specialisation was in civil engineering and nuclear reactor two phase flow problems but activities soon turned towards business data processing and information retrieval. In 1967 their first medical abstracting system was implemented (on NCR - CRAM). Gradually they became involved in work with scientific journals and this led to text editing, computer typesetting and later direct production of films for litho printing. The phototypesetting equipment consists of one Digiset machine.

- Also developing alongside DEC hardware interests is a process control and telemetry capability which has evolved into a small but competent microelectronic equipment design and manufacturing capability. Some of the products are described in brochures. Microprocessors are based on the Intel 8080 chip.

- Authorised Capital = f 5,000,000: Issued Capital Paid Up = f 3,272,000.

HARDWARE

- 6 x PDP 11 processors Models 40 to 70, supporting in-house file storage capacity of 1500 megabytes.

- 1 x Digiset Phototypesetter.

KEY PRODUCTS AND SERVICES

- Standard systems division handles:

  - Project management,
  - Software applications for:
    - o publishing and graphics industry,
    - o process control,
  - Hardware maintenance and support.

- Special systems division handles:

  - Hardware integration for microprocessor systems,
  - Interfaces,
  - Telemetry systems.

- Service Division (the TEXOM subsidiary) handles:

  - Computer bureau operations,
  - Typesetting and Library applications,
  - Bookmakers service,
  - Word processing.

- The distribution of sales is:

	%
TEXOM Service Division	25
Special Systems	25
Standard Systems	50
TOTAL	100

- The company has a wide spread of clients in the publishing and libraries field and a good spread of public and private company clients.

- The company's list of projects shows that ARSYCOM is very much in high-technology with a process control and scientific applications orientation. The largest project at present involves 9 x PDP 11/35's and 300 terminals for a typesetting system being installed in Australia. Among software innovations is a PDP 11 multi-processor configuration with hardware transparancy to the software and applications (somewhat similar to the American Tandem "non stop" computer).

MARKETING STRATEGY

- The management believes that organisations of the size of ARSYCOM must specialise in market sectors which are not worthwhile to larger companies.

- Application specialisation is backed by recruitment of staff with the correct motivation for high-technology projects.

- There is no intention to enter the straightforward commercial d.p. systems sector.

b. **COMPANY HIGHLIGHT**

NOVA AUTOMATION CONSULTANTS B.V.
3431 - ER Nieuwegein - N
Nedereind 30
The Netherlands

TEL: (03402) 39724

Chief Executive:
Mr. H.P. Sporken
Turnover: f 9M (1977/78)
(Est) f 18M (1978/79)
Staff: 60

THE COMPANY

- Trading started in October 1971 in Rijswijk and has continued until the present after moving in January 1975 to Utrecht. Nova became a B.V. in December 1975.

- The company is owned and run by Mr. Hein Sporken, who is a programmer by background. He has developed an organisation which concentrates on the production of application software.

- Last year was their first as an OEM customer of Hewlett Packard. The turnover in hardware alone was 4M Guilders in 1978 and is expected to be 12M Guilders during this year.

- Revenue for software services was 4.5M Guilders last year and is expected to be 6M Guilders this year.

- Only 0.5M Guilders was generated last year by bureau services.

- There is no captive revenue nor any export revenue.

- Registered capital is 75K Guilders of which 18K Guilders is issued and fully paid.

KEY PRODUCTS AND SERVICES

- In 1978 revenue was split evenly between hardware and software after the small proportion (around 6%) of bureau business is substracted.
- There is no captive revenue.
- Major contracts are running currently with Ballast Nedam, Bredero, NMB and Local Government.
- At any one time two thirds of the staff are working on IBM 370 projects and the remainder on HP based projects.

HARDWARE

- H-P 3000, 1000 and 300 systems for application development and some bureau services.

PRODUCT MARKETING STRATEGY

- Current policy is to increase the percentage of revenue gained on hardware sales. Hence the move to turnkey systems based on OEM Hewlett-Packard equipment.
- Some subsidiaries outside the computer services field have recently been set up. This indicates a trend to diversification.

B.3 MIXED SERVICES VENDORS

a. CMG

b. INFONET

c. LOGISTERION

a. **COMPANY HIGHLIGHT**

CMG NEDERLAND B.V.
Laan van Kronenburg 14
Postbus 159
Amstelveen
The Netherlands

General Manager
Mr. W.N.J. Koppers
Turnover: f 23.3M (1979)
(Est.): f 30 M (1980)
Staff: 200

TEL: 020/45.72.51

THE COMPANY

- The CMG (Computer Management Group) group first started trading in the Netherlands in 1968. Since that time four operating companies have been set up in Holland:

  CMG Amsterdam B.V.
  CMG Rotterdam B.V.
  CMG Amstelveen B.V.
  CMG Den Haag B.V.

  These four companies are subsidiaries of CMG Nederland B.V.

- The business consists of consultancy, software development and bureau services. Software services are offered on a wide range of equipment including mainframes, small business computers and minicomputers. An increasing percentage of work is done in the area of consultancy, advising clients on the selection and implementation of small and mini-computer systems.

- Approximately 50% of the turnover is in tailored software development projects. CMG Amstelveen B.V., for example, specialises in such work for the banking industry.

- Bureau services are based on Burroughs equipment. A new computer has been installed for the Amsterdam centre, and is shortly to be upgraded.

- Overall sales in the Netherlands increased by around 30% in the last 12 months. This continues the growth of the previous two years. Profitability has also increased, as this expansion has taken place.

- CMG Nederland B.V. is a wholly-owned subsidiary of CMG (Computer Management Group) Ltd., the U.K. holding company.

HARDWARE

- Bureau services are run in batch and timesharing modes.

- Equipment installed consists of:-

  - Burroughs 3 x B 3800,
  - 1 x B 771 RJE.

- Like the U.K. companies of the CMG group, the Dutch companies operate a terminal network (approximately 50 terminals) consisting of User Site Hardware systems of the following types:

  - VDUS or serial printers
  - Datapoint 1500
  - Texas Instruments TI 742.

KEY PRODUCTS AND SERVICES

- CMG concentrates on commercial data processing to the virtual exclusion of scientific and technical applications

- Important application areas are:

  - accounting for sales, purchase and general ledgers,
  - payroll and personnel records,
  - inventory and stock control
  - manufacturing systems,
  - membership subscription records,
  - banking and other financial institutions.

- Specific products exist for:

  - payroll (PROCESS and PAYFACT),
  - investment management (BAS and INVEST II),
  - financial management (FACT),
  - inventory/stock control (CENDIS),
  - subscription administration (ONEX),
  - motor dealer accounting (GAS),
  - banking (INTABS),
  - royalty accounting (TRACS).

MARKETING STRATEGY

- CMG offers a range of services broad enough to cover most commercial applications with software and/or processing services. This entails a flexible approach to customer requirements.

- Complementary to this sales policy is an organisation and management structure designed for flexibility. The front line interface with the customer is the CMG Customer Service Group, consisting of a manager and his team of consultants, who have the authority to draw on both local and group resources where necessary. This structure ensures flexibility and quality.

- CMG is by deliberate policy a mixed services vendor, that is, both a service bureau and a software company. In Holland, CMG employs 100-120 software development staff, 50% of whom are engaged on small business systems work. CMG ranks in the top three software houses in the country.

- Involvement in projects such as the SWIFT banking network, have led CMG to the position of being a multi-national services vendor operating in the European national markets.

b. COMPANY HIGHLIGHT

INFONET B.V.
Nieuwe Prinsengracht 75
20106
1000 HC Amsterdam
The Netherlands

TEL: 020/26.24.95

General Manager
Ir. G.J. van den Berg
Turnover: f 10M (1977)
(Est.): f 13M (1978)
Staff: 95

THE COMPANY

- Trading started in 1968 when Infonet was still a division of Elsevier.
- Infonet became a B.V. in 1972 and VNU joined Elsevier as a co-owner.
- The entire equity in the company is now owned by VNU and Elsevier who have 50% each. The management do not have any holdings whatsoever.
- Both owning companies are in publishing and have a combined turnover of around £4,000M and each have substantial in-house data processing facilities. Their interest in Infonet is for profit generation and for the supply of specialised database and typsetting services.
- A new management team (also the present one) was hired between December 1975 and August 1976.
- The turnover in 1977 was 10M guilders.

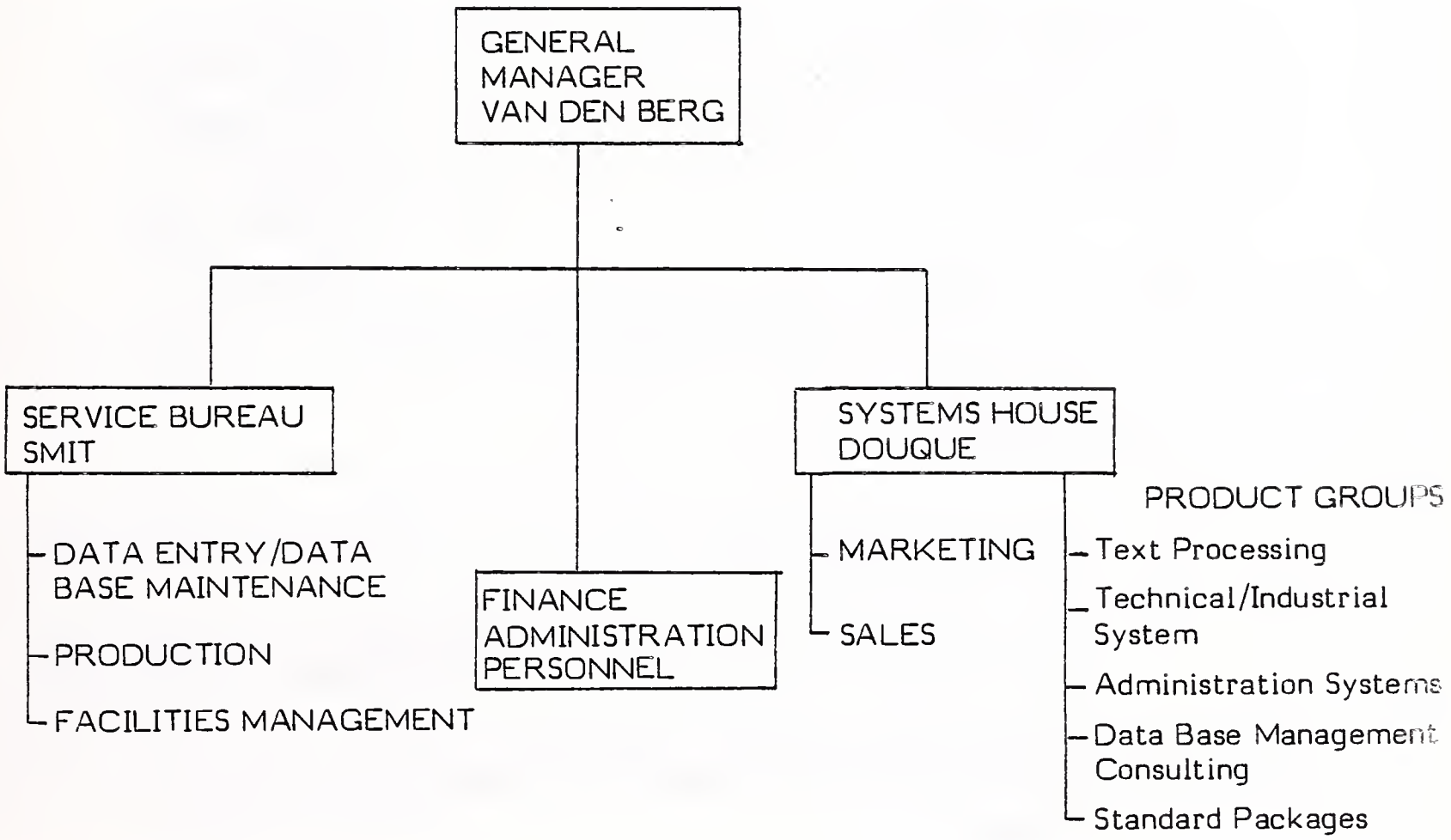
HARDWARE

- DEC PDP 11/45 and 11/70.
- H-P 3000 II.

KEY PRODUCTS AND SERVICES

- Total revenue is split 50/50 between the bureau and systems house operations.
- Captive revenue from the parent companies is 30% overall; 25% is bureau typesetting business and 5% is system house business.
- The major contracts on the bureau side are with the two parent companies; other significant contracts are with the publishers of Scientific American and Excerpta Medica (a publication of Elsevier).
- Major contracts for systems house work are running with Philips, Moulinex, ESTEC and the Dutch Government.
- Infonet began as a specialised computer typesetting division of Elsevier and this is still a mainstay of current business. The business which has developed subsequently is mainly DEC and HP mini based with some IBM mainframe database consultancy. Some experience has also been gained on micros, particularly INTEL 8080 and ZILOG Z80.

INTERNAL ORGANISATION



c. **COMPANY HIGHLIGHT**

LOGISTERION B.V.
Groothandelsgebouw A3
Stationsplein 45
Rotterdam

TEL: 010 - 119648

F.H. Bouws
Managing Director
T.B. de Waart
Director
Turnover fl 10M
Total Staff 50

THE COMPANY

- Logisterion was founded in 1962 by Mr. F.H. Bouws, who had formerly been head of Scientific Services at N.L.R. (National Lucht en Ruimtevaart Laboratorium) the company is a wholly owned subsidiary of Kramer & Zoon. The parent company has a separate group of 50 analysts and programmers (referred to as Logisterion 'A') which supports its hardware marketing activities which include marketing and support of Kienzle, Adrema, Eumig and Fin-Address equipment.

- Until recently the company had concentrated in developing its original theme of engineering design calculation; in this field it is one of the leading specialists in Holland, Logisterion has a good reputation both in the quality of its staff and in its range of proprietary packages. Proof of this is shown by its client list.

- Recently the company is moving in the direction of creating a group and spreading its interests. Last year a significant shareholding was taken in a Belgian services company, WRC, which sells Logisterion software packages; this venture is expected to yield 100,000 Guilders of net income this year.

- The company also participates in the parent company's training centre for sales and behavioural science. At this time Logisterion supplies lecturers only but wishes in future to expand the course coverage and run the establishment as a subsidiary. A move in this direction is expected soon.

- Until recently the company had had only very limited involvement with commercial applications. An agreement has now been set up with COSYS to produce tailormade software for mini computers; this is expected to result in the creation of a separate company called ERASMUS in which Logisterion will have at least a 33% stake.

- A Prime 400 computer was purchased 2 years ago and an interactive service based on it was started a month ago, seven clients have been signed up to date.

- As their interactive services develop on the Prime the link with CDC's 6600 is diminishing in usage.

KEY PRODUCTS AND SERVICES

- The company is organised into eight functional groups each of which reports directly to Mr. Bouws.

  - Civil Engineering
  - Mechanical Engineering
  - Traffic Engineering
  - Project Management
  - Technical Assistance/Software
  - Interactive Services
  - Building Components Database
  - Micro System Development

- The engineering and project management groups provide the revenue earning interface between the various sources of computer facilities available and their clients who are typically consultant engineers in government or construction companies.

- The technical assistance group develops new or existing software packages; it is claimed that they have developed Europe's best pipe stress package. Several of the Logisterion packages are used under license agreement by computer services companies such as CDC and UCC. Software is also developed for client's own machines.

- Interactive services are provided through the company's own Prime computer which either processes the work locally or acts as a front end to CDC's 6600. Alternatively clients may select the system and/or package facilities offered by ADP, CDC/NOS, UCC or GEIS; Logisterion has a terminal to connect with all of these services.

- A building components database (similar to Barbour Index) containing specifications and prices is being built up as a basis for a future information retrieval service.

- Micro systems are developed to extend the versatility of the parent company's products, for example a patient registration system has been developed by addition of micro processing power to an Adrema labeller.

- Contracts are and have been held mainly with government and construction companies; these include the Public Works and Pressure Vessel departments of the Dutch government and Badger, Lummus, Fluor and Foster Wheeler. Companies such as Shell, Caltex, BP, ICI, HCW and Bredero are also clients.

COMPUTER HARDWARE

PRIME 400 (on-line connection with CDC 6600)
ASR teletype (to connect with U.C.C. ADP, etc.)
CDC 6600 compatible off-line plotter

Computer Languages used:

- FORTRAN

C. VENDOR PROFILES IN BELGIUM/LUXEMBOURG

C.1 PROCESSING SERVICES VENDORS

a. CDC

b. IBM

c. ORDA-B

d. SLIGOS

a. COMPANY HIGHLIGHT

CDC DATA SERVICES N.V.
Rue de la Loi 15
1040 Brussels

TEL : 02.242.1080

Managing Director
L. Bartlett
Total Staff 30
Turnover 140M BF (Est.)

THE COMPANY

- CDC Data Services was set up at the end of 1973. It is an wholly owned subsidiary of the CDC Corporation U.S.A. The Brussels operation began by offering the timesharing services CALL/360 and KRONOS. SCOPE another service had already been available in Rijswijk (Z.H.) for some time previously. There are associated computer centres located in London, Frankfurt, Rijswijk (the Netherlands).

KEY PRODUCTS AND SERVICES

- The main products offered in Belgium are:
  - MINIMIS
  - PROFIT
  - S2000
  - Scientific Packages
- The area covered by these services is mostly Brussels and Antwerp.

REVENUE

- o Processing services revenue earnings are fairly evenly balanced.
  - Interactive 80M. BF.
  - Batch and Remote Batch 75M. BF.
- o The main customers so far have been Kredietbank and Esso, but CDC Data Services covers most market areas.

b. **COMPANY HIGHLIGHT**

IBM BELGIUM NV SA
1 Square Victoria Regina
1030 Brussels

TEL : 02/219.38.80

Managing Director
C.A. De Meyer.
Turnover 10590 M BF
Fiscal Year Ending
31 December 1977
Total Staff 2500

DATA CENTER SERVICES (DCS)
J.F. Kennedylaan, 2
1920 Diegem

TEL : 02/720.51.80

DCS Manager
A. Richel
Turnover 450-650 M BF
(Input est)
Fiscal Year Ending
31 December 1977
Total Staff 140

THE COMPANY

- IBM Belgium started its operations in 1936 and had a very quick growth. Its activities cover Belgium and Luxembourg, with offices in the major Belgian towns. The DCS started in 1950, offering batch processing, keypunching and programming.

- In October 1967, IBM had built in Diegem, near Brussels Airport, a centre for its technical services and DCS. The original area of 1000 M2 has increased (it now covers an area today of 30,600 M2) and seen the start of the Remote Computing Services (RCS) with RJE, and RAX.

- In 1971, the Call/360 and CRJE service were added. At that time the computer equipment consisted of 360/65, 360/50 and a 360/40. A first 370/158 arrived in 1972 to supply the Batch, RJE and CRJE services, while a 360/50 continued to offer CALL/360.

- Several application programs were developed locally: accounting, invoicing, payroll, inventory control. International programs like Promise (later Stratplan), Statpack and Minimis made of the Call service a true user-oriented computer tool. Strudl, MPSX, Survey and Pert were made available under RJE and CRJE. In conjunction with the sales of computer time and packages, IBM DCS provided a range of terminals to be connected to their mainframes. In 1974-1975 DCS changed the last 360 to a model 370. They installed TSO, TBS and APL as new RCS services.

- In 1976 a new user-oriented package Application System (AS) was introduced to supercede Stratplan, Minimis and Statpack on Call/370.

- In 1977 VSPC (Virtual Storage Personal Computing) was announced and in September 1978 EPCS (European Personal Computing Service), the first international service of DCS, linking 6 European countries to the same mainframe.

- Also in 1978, two OECD data banks were made available on DCS.

THE ORGANISATION

- The commercial department of IBM Belgium is split into three divisions:

  Data Processing (DPD) big systems

  General Systems (GSD) small and medium size systems

  and Office Products (OPD).

- General Systems and Office Products are grouped into General Business Group.

- In every group, the marketing is divided by industrial sector and by geographical sectors for the small and new business.

- IBM DCS and RCS are both part of IBM DPD, such that the actual sales performance cannot be separately identified.

- The DCS employs about 140 people, of which some 25% are university graduates. The analysts, programmers and operators are split into teams, each specializing in a specific branch or industry. DCS makes use of the IBM Computing Centre resources. The Computing Centre's personnel and equipment is also used internally by other IBM divisions for development, benchmarks, installations, etc...

THE HARDWARE

- Diegem possesses one of the largest computer centers in Belgium, not only in the number of machines installed but in the computing power available.

  IBM 370/158 Multiprocessor 8MB

  2 X IBM 370/158 of 3 MB

  3 X IBM 370/155 OF 1, 1.5 and 2 MB.

- More than 550 terminals are connected to those mainframes. Other equipment available:

  IBM 3800 printer (13000 Lines per Minute)

  Plotter

  IBM Optical mark readers.

KEY PRODUCTS AND SERVICES

AS

This system (Application System) was designed to allow users with no programming knowledge to apply Call to their problems. Like Call, AS is a command driven system and runs as an integral application on Call.

The AS system offers several language/command modules:

- AS Report
- AS Model (used to produce RPG II-like programs)
- AS Forecasting
- AS Graph (high resolution curve plotting)

IBM emphasises AS as an Oliver/table type language system which offers functional compatibility between the modules. Its effect is to tie users into a single problem solving language, specific to IBM, rather than offering separate single packages which place their own learning curve demands on the user.

Separate packages continue to be offered on Call, however, the main ones being:

- Statpack (Statistical Analysis)
- PNA (Critical path and resource allocation)
- Stratplan (financial planning and modelling)

Call offers also Basic, Fortran and PL/1.

VSPC

AS and Call/370 are now integrated in VSPC (Virtual Storage Personal Computing), the new IBM Time Sharing and Remote service.

APL previously offered as a separate product is also available under VSPC.

Several programming languages can be used:

- in interactive mode: VS BASIC, VS APL, FORTRAN, PL/1
- in background (offline): VS BASIC, FORTRAN, PL1, COBOL and ASSEMBLER
- a whole range of program products and application programs are added like: MPSX, PROJACS, EPLAN, MINIPERT, etc.

EPCS

This service was announced in September 1978. It allows companies or organisations with affiliates in different european countries: Belgium, France, Germany, Italy, the Netherlands and United Kingdom to be linked to the same computer, having access to the same information or files.

The service uses the program product VSPC and is interesting both to the professional user and management. The users have access to this service from an IBM 370/158 computer, installed in Zoetermeer in the Netherlands. The international network consist of high speed lines using the SNA principles.

The programming languages available are APL, Basic, Fortran and PL/1. The program library is extensive and has also AS available. Security facilities integrated into EPCS consist of (1) protection against unauthorised system access, and (2) the confidentiality and integrity of user data and programs. Techniques used include identification numbers, passwords, access to specific program libraries and daily backup of information.

The service is available 5 days a week from 8 to 22H.

OECD

In June 1978 the Belgian Data Centre installed two OECD data banks on their computers:

- the main economic indicators (2300 historical series)
- the statistics of foreign trade (1350 products in 25 member states and 125 OECD connected countries)

Terminals Available

For these different services IBM has a choice of terminal equipment of which the main systems are:

- Teletype compatibles
- CMCT 72
- IBM 2740/1 1050
- IBM 3767 (Keyboard printer, SDLC)
- IBM 3770 family (diskette, programmable, SDLC)

- IBM 3270 family
- IBM 3790
- any IBM computer in RB mode

TBS

An important service of DCS is Terminal Business System (TBS) geared towards the Batch/RB user who is beginning to expand into transaction oriented applications.

There are four grades of TBS service:

- Fast (processed within 15 minutes of queue entry)
- Normal (processed within 2 hours of queue entry)
- Overnight
- Deferred (processed within 7 days of request or to an agreed schedule)

Utilities include File Definition, File Loading, File Enquiry, Report Writer, File Maintenance and Utility Printing. Parameter commands such as Record and File parameters and Application Job parameters describe the content and sequence of data and processing.

For conversational processing a language is provided for analysts and programmers to describe the entire process they wish to accomplish. The program is then translated by a system utility and stored for retrieval/execution.

SALARY ADMINISTRATION

- One of the major Batch programs of DCS is the payroll package. The program is regularly updated for the new laws of social security and taxes. Various statistical reports can be obtained upon request by customer option.

ACCOUNTING

- The major success of DCS is the General Accounting package, with its different modules for the different ledgers, cost accounting, budgeting, etc. The major reference sales are the several automotive dealers who have been using the system for some years. The customer can input the basic information on normal computer forms or using a small machine that allows optical reading.

STRATEGY

- The DCS covers the entire market and offers clients a broad range of services. As such, it completes the role of the IBM DP Division. Even when the users possess their own computer, the DCS offers them the possibility of utilizing the facility to effect certain work more efficiently.

- In fact when connected to the Centre by terminal and telephone network, these users virtually become small satellite units and have at their disposal computing power greatly exceeding that offered by their own installations.

- Besides this, the Data Centre carries out specific work as required by clients.

- A whole range of highly trained specialists is at the disposal of IBM's customers to enable them to obtain optimal solutions to their problems. In some cases, the DCS also undertakes for clients the complete setting up of applications and their subsequent servicing.

- IBM Data Centre is Belgium's major time-sharing company. IBM's recent hiring spree has been accompanied by a renewed attack by it on the RCS market. This must be taken seriously by the other top RCS vendors (GTS, CDC, CIG) due to:

    (a) the integrated education, service and support available nation-wide to users of IBM's DCS/RCS services through DP Division

    (b) the sheer number of salesmen that IBM deploys

    (c) IBM's image in all that it does.

- The most recent service, EPCS, shows that IBM wants also to cover the market sector for internationally linked users, a service that could only be provided till now by the international time-sharing companies.

c. COMPANY HIGHLIGHT

ORDA-B N.V.
BIERBEEKSTRAAT 89
3040 KORBEEK-LO

TEL : 016/23.99.00

CHAIRMAN
G. Declercq
Executive Manager
J.H. Mutton
Turnover 200M BF
Fiscal Year Ending 31/12/78
Total Staff 120

Offices in BRUSSELS, ANTWERPEN, KORTRIJK, HASSELT, MAASMECHELEN, HEVERLEE.

THE COMPANY

- The company was established at the end of 1970 and comprises four shareholders:

  - KUL (Katholieke Universiteit Leuven),
  - Kredietbank,
  - Boerenbond (Belgian farmers organisation)
  - VRW (Vereniging van Kristelijke werkgevers, Association of Employers).

  Each of them hold 25% of the shares.

- At the creation of the company two branches were set up, one in Korbeek - Lo (Near Louvain) and another in Antwerpen. In later years other branches were created in Kortrijk, Hasselt and Brussels. During the year 1976 a Company in the province of Limburg, L.M.C. (Limburgs Mecanografisch Centrum) was acquired.

- A second branch was created in Brussels by the take-over of NEA, a local service bureau already using the facilities of ORDA-B. In 1978 the two Brussels branches merged in a new building.

- At the end of 1976 ORDA-B, which was oriented towards the northern part of the country, started to market its services in the southern part.

- The turnover of the company increased rapidly:
  - 1976 36M BF
  - 1977 165M BF
  - 1978 200M BF.

- ORDA-B also pursues cooperation on a European level. For this purpose, an agreement has been concluded with RAET, a Dutch service bureau. The agreement has been widened to include ALL-DATA SERVICES in Germany.

THE ORGANISATION

- Through its several branches, ORDA-B offers its various services on a local distributed level. The marketing and technical departments are concentrated in Korbeek-Lo and Brussels. A rapid expansion of the Brussels branch is expected in the coming years.

HARDWARE

- ORDA-B shares with one of its shareholders the IBM 370/158 computer in Heverlee (memory 4000K). Large disk and tape memories with extensive tele-processing possibilities are made available to customers. Back-up facilities are provided by two other shareholders' configurations: the Kredietbank and the Farmers Organisation, who have together 4 IBM 370/158s available linked to ORDA-B.

- At the beginning of 1979 the main IBM 370/158 will be upgraded by addition of a second configuration of the 3033 series.

- In the five main branches, terminals are available for customers, mainly DATA 100s.

PRODUCTS AND SERVICES

- On its IBM 370/158 ORDA-B offers to its clients the opportunity to link their computer, terminal or minicomputer through telephone lines.

- Products offered are :
  - Local Batch processing,
  - Remote Job entry,
  - Interactive applications (T.S.O. and A.P.L).

- The main languages are : Assembler, BASIC, COBOL, FORTRAN, PL1, APL, RPG II.

- Wide experience has been gained with the following companies terminals or minicomputers: IBM, Data 100, Datapoint, Olivetti, Wang, Texas Instruments.

- ORDA-B also offers Facilities Management, using the IBM S/1 and the Texas Instrument mini computers. A whole range of application programs has been developed for both systems.

- The company provides consulting advice, programming, systems analysis, training and education.

- Packages include :
  - Finance and accounting,
  - Social security and payroll,
  - Production systems,
  - Insurance,
  - General business systems (order-entry, stock, invoicing, General Ledger),
  - Health organisation,
  - Mailing,
  - Market research and statistics,
  - Generation of systems programs (PAC).

d. COMPANY HIGHLIGHT

SLIGOS S.A. BENELUX
Avenue Lloyd George 7
1050 Brussels

TEL : 02-649-9653

Managing Director
G. Bauvin

Total Staff: 230
Turnover: 310M BF.

THE COMPANY

- Sligos S.A. Benelux, was formed in 1973 from the EDP department of Papeteries de Belgique. It is owned by: Sligos France 60% and Papeteries de Belgique 40%, who themselves are a member of the group Societe Generale. There is also a subsidiary company of Sligos S.A., Industrial Computing, which was formed shortly after the setting up of the major company. In 1975 Sligos acquired SMCS Informatique which had been established in 1947, and again in 1976 they acquired Creative Micromedia which had been established in 1975.

KEY PRODUCTS AND SERVICES

- The main products offered by Sligos are:
  - Batch
  - Remote Batch
  - Interactive Timesharing on an IBM 370/145
  - Turnkey Systems

- Programming
- Punching

- They have successfully completed for some 16 Belgian Banks a cash-dispenser application facilities management.

GEOGRAPHIC COVERAGE

- Brussels
- Tournai
- Acilst
- Charleroi

- Activities are mainly in the French speaking part of Belgium and they also extend their activities into the Northern part of France.

REVENUE

- 20% of the company revenue is captive from one of the shareholders 'Papeteries de Belgique', and the main customer areas have been Banks, Insurance, Levi Strauss and Atlas Copco.

HARDWARE

- ITEL A/5
- IBM 145

C.2 SOFTWARE/PROFESSIONAL SERVICES VENDORS

a. Arthur Andersen

b. CIG

c. Computer Sciences (CSC)

d. GERAC

e. Instituut 2000

f. Paramin

g. SOBEMAP

a. **COMPANY HIGHLIGHT**

ARTHUR ANDERSEN & CO
AVENUE DES ARTS 56
BRUSSELS

TEL : 02/513.6436

Managing Director
G. Gijsemans

Total Staff 22

THE COMPANY

- The Arthur Andersen Administration Service Division is the part of the organisation (with a total staff of 120 in Belgium) which provides the systems and consulting services. It is rapidly expanding with a present staff of 22 people.

PRODUCTS AND SERVICES

- The products and services provided in Belgium are based on the experience of the Arthur Andersen group world wide, a variety of services are provided in the following areas.

  - Finance

    In finance, work includes long and short-range planning, financial modeling, responsibility reporting, general accounting, transaction systems, cash management, capital budgeting, accounts payable, payroll and related financial activities.

- Marketing

In marketing, the company assists clients primarily with their marketing and planning and reporting systems. It develops product management systems covering elements such as pricing, studies of promotion and advertising, and sales forecasting, as well as sales administration systems, such as customer profiling, territory management, salesperson compensation and sales channel selection and evaluation. This division also develops customer service systems involving order processing, credit evaluation and control, warehousing, traffic, physical distribution and planning.

- Operations

In operations, the aim is to develop systems that assist companies in acquiring and controlling personnel, material and facilities. This may involve resource planning, inventory management, purchasing controls, labour and other resource scheduling, and productivity controls.

- Information Processing Systems

The information processing services which the firm provides are, perhaps, the broadest of any comparable organization, ranging from the design and installation of computer systems to assistance in projects to improve the effectiveness of computer use.

The following are some of the systems and installation aids which have been developed:

- Financial Systems

Accounting Systems for Small Business (RPG II)

General Ledger and Responsibility Reporting
Accounts Payable
Accounts Receivable
Payroll

FIN-PAC (Financial Planning and Control System)

- Manufacturing Systems

  MAC-PAC (RPG II)

  (Manufacturing Planning and Control System for Small and Medium-Sized Companies)

  MAC-PAC (COBOL)

  (Manufacturing Planning and Control System for Medium-Sized and Large Companies)

- Marketing and Distribution Systems

  Marketing Analysis System

  Distribution Control System

- System Support Aids

  LEXICON Data Dictionary

  LEXICON Report Writer

  LEXICON Data Entry and Validation System

  GEM (Generalized Executive for Modeling)

  STEP-3 Project Control

  AUDEX (Audit Exact System)

These software packages - as well as others not listed here -are fully tested, documented and supported. The software development and support activities are coordinated by the Technical Services Organization located in Chicago (USA), in New-York (USA) and in three Software Management Centers in Europe: Hamburg, London and Paris.

b. **COMPANY HIGHLIGHT**

C.I.G. S.A.
Centre d'Informatique Generale
rue de la Chancellerie, 13
1000 BRUSSELS

TEL : 02/513.41.10

P.M. OURY
President
E. de VILLEGAS DE CLERCAMP
President of the board of directors
M. DELACROIX
Director
Group turnover 720M BF
Fiscal Year ending 31/12/78
Total staff 400

Affiliated Companies : C.I.G ALFA (Antwerpen), C.I.G Liege, C.I.G Charleroi, G.T.S (General Time Share), G.E.M.C., HISPABELSA (Madrid)

THE COMPANY

- CIG was created 3rd March 1969 with a capital of 50M BF by Union Miniere (Mining and Metal Industry) 50% and Belgonucleaire (Nuclear engineering and research) 50%. The two companies combined their expertise, people and computer hardware, with a total starting staff of 45 people.

- In 1970, CIG participated in the creation of an affiliated company, GTS (General Time Share).

- In 1972, the biggest Belgian private bank, Societe Generale de Banque, became the major shareholder by doubling the capital of the company. In 1972 the shareholding was :

-	Societe Generale de Banque	50%
-	Union Miniere	25%
-	Belgonucleaire	25%

- CIG offers international links with CISI (Paris) on their IBM and CDC computers. The systems available are APL, TSO and Kronos. Many application programs in the scientific, industrial and management area are provided.

- Through its affiliate GTS, access is provided to the Mark III service of the General Electric Company in the U.S. and throughout the world.

• Program products.

- CIG has developed an important number of program products for Management applications:

  . accounting
  . sales analysis and billing
  . personnel applications and payroll
  . survey analysis

- Scientific applications:

  . chemical
  . electricity, nuclear
  . construction
  . mining

- CIG provides aids to computer departments in the development and use of applications through its specialized computer methodology.

- Recently CIG began attacking the distributed processing market through the use of microcomputers on user sites, connected through a network to the CIG computer centres. CIG has already installed more than 1000 units of these microcomputers. GEMC its affiliate, ensures the delivery and maintenance of hardware.

GEOGRAPHIC COVERAGE

- CIG has hardware centres in Brussels, Antwerpen, Liege, Charleroi and Brugge, commercial centres in Oostende, Gent, Charleroi, Namur and technical service centres available in Brugge, Kortrijk, Gent, Antwerpen, Brussels, Leuven, Mons, Namur, Liege, Villers-le-Bouillet.

PRODUCT AND MARKET STRATEGY

- The product strategy of CIG is based on four main axes:

  - connection of microcomputers to powerful hardware by means of data networks

  - installing distributed microcomputing at user sites

  - providing central computer power

  - sales of application programs in several areas, mainly general accounting, Pert, mining prospection and exploitation,

The market strategy of the company is to provide these products and services to large as well as to small and medium companies.

c. COMPANY HIGHLIGHT

COMPUTER SCIENCES EUROPE SA
Infonet Belgium S.A.
Avenue Louise 350/358 Bte 1
1050 Brussels

TEL : (02) 648.6980

Managing Director
W. Scmaer

Staff: 10
Turnover: 9M BF.

THE COMPANY

- Operations began in mid 1976, and early in the following year local Brussels personnel were hired to actively market Infonet products in Belgium. A few months later the company became a dynamic operation, and rapid expansion is expected in the next two years. The Brussels location is also the main European office.

KEY PRODUCTS AND SERVICES

- Main products offered:
  - Aladin
  - Flares
  - Distat

HARDWARE

- Univac 1108
- Univac 1180
- IBM 370/158

d. COMPANY HIGHLIGHT

GERAC C.V.
GEMEENSCHAPPELIJK REKENEN
ADMINISTRATIEF CENTRUM
ARENBERGSTRAAT, 14
2000 ANTWERPEN

TEL : 031/33.87.10

Managing Director
D. LOOZEN

Turnover 51M BF
Fiscal year ending 31/12/77
Total Staff 34

THE COMPANY

- GERAC was created in February 1969 by C.M.W. (Complex voor Maatschappelijke Werken) which owns 60% of the shareholding.

- C.M.W. comprises a series of organisations handling the application and the implementation of social security. The organisations are : a social secretariat for employees, family allowance funds and an insurance fund for self-employed workers.

  To meet the requirement of its customers, GERAC was constituted to undertake all administrative tasks related to payroll and salary applications.

KEY PRODUCTS AND SERVICES

- Several routines were progressively developed for :

  - accounting administration
  - member management
  - inventory administration
  - invoicing
  - building management
  - cost calculation, etc...

- The different services provided by the company are:

  - Data entry
  - Program development
  - Batch processing
  - R.J.E. processing
  - Real time applications

HARDWARE

- GERAC has an IBM 370/138 computer with 1000 KB and 1,200 MB external memory. The computer is linked with an IBM 3705 for control of the phone links of on-line customers.

- The office at Sint Niklass is equipped with a fast terminal, connected the whole day with the host computer in Antwerpen.

- Data entry equipment is IBM 3740

- Several paper processing machines: cutting, decollating and binding.

THE ORGANISATION

- The organisation has been set up so that every customer has an analyst programmer of GERAC in charge of his applications; this analyst-programmer stays the same where possible, so that contacts are very easy. This concept results from the beliefs that every customer has specific problems, and that though use can be made of existing routines, packages alone do not satisfy the complete requirement. Generally a package will be tailored for each customer.

- Contracts are principally offered for fixed periods of not less than 12 months, but can be adapted according to the needs of the customer.

- The prices of processing sevices are, as much as possible, related to a unit easily recognized by the customer (i.e. an invoice) and the amounts payable are therefore connected to the activities of the user. By using the latest technological developments, most of the planning and setting up of any package or service is carried out on site.

e. **COMPANY HIGHLIGHT**

INSTITUUT 2000 N.V.
JULIAAN DILLENSSTRAAT, 51
2000 ANTWERPEN

Managing Director
W. Braeckmans

TEL : 031/37.66.98

Total Staff 3

THE COMPANY

- Institute 2000 N.V. was founded on 22 April 1977 by three shareholders:

  W. Braeckmans
  L. Wittmann
  G. Bellemans

  each has 32% of the capital of 1¼M Belgian Francs.

- At the outset the activities of the company were mainly the processing of card and floppy disk input.

KEY PRODUCTS AND SERVICES

- The company has now developed (they have been available since 1st November 1978) packages in the following areas:

  - Accounting
  - Cost Accounting
  - Inventory Control
  - Invoicing

HARDWARE

- If circumstances are favourable the company will acquire in 1979 a small computer configuration. This will allow the company to run these systems and programs on its own equipment .

FUTURE STRATEGY

- Due to the favourable movement in hardware prices the future market will be for the small and medium-size businesses and the users of office computers. The last mentioned will require the services of the programming side. As soon as the data center service becomes fully active the company will develop its third objective, rent and sale of mini and micro computers.

f. **COMPANY HIGHLIGHT**

PARAMIN INTERNATIONAL CORPORATION
20 Avenue de L'armee
1040 Brussels

TEL : 02.736.1074

President
John B. Mikle
Vice President and
Managing Director Brussels
Gary J. Angstadt
Staff Brussels: 3

THE COMPANY

- Paramin International was established in Belgium in 1976 and is owned 90% by Paramin Inc., Massachusetts, U.S.A., which was founded in 1974, and 10% by Gary J. Angstadt. In 1978 the company established an office in the United Kingdom to provide a mini and micro computer consultancy to the U.K. market.

- Paramin International maintains a fully staffed office in Brussels, for the purpose of providing consultant services to the Belgian and other European markets. The staff and capabilities in Brussels parallel the same expertise as is available in the U.S.A. from Paramin Inc.

- The company was founded as a systems and software engineering organisation with the express purpose of providing software expertise to the minicomputer and microcomputer industries. Great care is taken in attracting highly qualified and motivated staff with several years of experience in software design and development.

- Paramin has a client base which includes electronic research and development firms, high technology engineering and manufacturing companies, scientific agencies, and mini/micro computer manufacturing companies.

PRODUCTS AND SERVICES

- Paramin is a systems development and software engineering firm providing consultant services to the minicomputer and microcomputer industries. Paramin's client base includes both end-users and manufacturers of mini and micro computers in Europe, Asia, and America.

- Paramin continues to develop and has provided resources (its staff and technical expertise) to clients in the following areas:

  Operating Systems:

  - Real-time executives
  - Multi-user minicomputer resource and timesharing operating systems
  - Microcomputer executive, multi-tasking systems

  Compilers, Interpreters, and Assemblers:

  - Cross-assemblers for mini and micro computer systems
  - Macro-assemblers
  - Link editors and mapping systems
  - BASIC interpreters
  - Structured language compilers

Diagnostic Software:

- Computer diagnostic systems for testing of micro-processors, memory, arithmetic components, data/address/control busses, interrupts, instrumentation busses, and logic networks

- Specialized diagnostic software for testing of modules and peripheral devices

- Remote testing of target processor and source-level software

Communications Software:

- Applications, drivers, link and access level software for remote terminal to host communications

- Communications network design involving minicomputers and microprocessors employed as switches, concentrators, and network control nodes

- Bit and byte synchronous protocols including bisync, HDLC, and X.25

Database Design and Access Methods:

- Design of hierarchical data base structures and access techniques operating in conjunction with real time systems

- Development of keyed access systems including ISAM

- Implementation of security and privacy techniques at the volume, file, and record access levels

I/O Drivers:

- Specialized drivers for instrumentation, sensor and discrete I/O
- Software drivers and operating system integration for device interfaces

Applications:

- Process monitoring and feedback control systems for industrial discrete and continuous flow systems
- Subscriber and trunk line switching systems
- Production and inventory control systems

STRATEGY

- Paramin's success and reputation are a direct result of its client relationships. All work is done on a contract basis with a majority contracted on a fixed price basis. Most of Paramin's systems development projects are the primary responsibility of Paramin's project team, whether that be one person or several. All projects are closely managed by Paramin and include meaningful status reporting to client personnel.
- Paramin's marketing philosophy is to acquire contracts requiring both design and implementation of software systems. All members of Paramin's staff are experienced in design as well as software implementation and are therefore capable of performing all phases of project development: from functional design through system test and integration.
- Through the use of structured design techniques, structured programming even at the assembly language level, project management, documentation, and the ability to complete projects within time and budget goals, Paramin's clients have found that the software developed is human engineered, easy to maintain, and reliable. This in return has given Paramin success, the ability to grow, and an excellent reputation.

g. COMPANY HIGHLIGHT

SOBEMAP
Place du Champ de Mars 5 Bte 40
1050 Brussels

TEL : 02-5125990

Managing Director
B. van Ommeslaghe
Manager SGAB
P. Roussel
Total Staff: 110
Turnover: 180M BF.

THE COMPANY

- Sobemap was formed in 1960 and is owned by:
  - Metra International Group 51%
  - Electrobel 49%
- In the group there are; SGAB, which is the computer service division, and Mecavoloc, the consulting and hardware division. There are also affiliated companies in Algeria, Brazil, Zaire and the Ivory Coast.

KEY PRODUCTS AND SERVICES

- Sobemap market a variety of packages including:
  - COGEN (General Accountancy)
  - SALPAC (Payroll System)
  - MEGA (Files Organisation System)

- SYMPAC (System for Administration)
- B.D.G. (System for the Building Industry)

- The key services include:
  - Applications Software
  - System Software
  - Turnkey Systems
  - T.P. Software and Applications
  - Real Time Systems
  - OEM Agreements

- These services are aimed to cover all the main industrial application areas.

GEOGRAPHICAL COVERAGE

- Brussels
- SGAB Brussels, Liege
- Mecavoloc Brussels, Antwerp

HARDWARE

- PDP 11/70 x 2
- Honeywell x 2

D. DOLLAR EXCHANGE RATES USED IN THIS REPORT

APPENDIX D: DOLLAR EXCHANGE RATES USED IN THIS REPORT

ONE DOLLAR EQUALS:

COUNTRY	RATE	UNIT
FRANCE	4.74	FRANCS
FEDERAL REPUBLIC OF GERMANY	2.11	DEUTSCHMARKS
UNITED KINGDOM	0.51	POUND STERLING
ITALY	824	LIRE
SWEDEN	4.65	KRONER
DENMARK	5.25	KRONER
HOLLAND	2.27	GUILDERS
BELGIUM/LUXEMBOURG	32.70	FRANCS

E. NETHERLANDS PTT ADDRESSES

APPENDIX E: NETHERLANDS PTT ADDRESSES

Contact address

M.M.C. Alberti
Central Telecommunications
Subscriber Services Branch
Kortenaerkade 12
The Hague
The Netherlands

Telephone: +31 70 75 39 08
Telex: 33023

F. BELGIAN PTT ADDRESSES

APPENDIX F: BELGIAN PTT ADDRESSES

Contact address

- Enquiries concerning terminals and modems:

  Regie des Telegraphes et des
  Telephones
  Departement reseaux abonnes
  42, rue des Palais
  B-1030 BRUXELLES

  Telephone: +32 2 217 80 50
  Telex: 25130

- Enquiries concerning networks, ciruits and tariffs:

  Regie des Telegraphes et des
  Telephones
  Department de la
  Transmission
  42, rue des Palais
  B-1030 BRUXELLES

  Telephone: +32 2 217 80 50
  Telex: 25351

- Enquiries concerning service and maintenance:

  Regie des Telegraphes et des
  Telephones
  Service National d'Exploitation
  et de Coordination (NEC)
  17, rue de Ruysbroeck
  B-1000 BRUXELLES

  Telephone: +32 2 513 69 85
  Telex: 23700