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REPORT CONCERNING THE DEVELOPMENTS  
IN THE DATA-PROCESSING SECTOR IN THE COMMUNITY  
IN RELATION TO THE WORLD SITUATION

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## CORRIGENDUM

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VOLUME III

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English Edition

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## INTRODUCTION

This study was originally intended as a response to the Council's invitation to the Commission, in its Resolution of 15 July 1974 on a Community policy on data processing, to submit by the end of 1975 a report on developments in the data processing sector in the Community in relation to the world situation.

To organize the collection of information from member countries, an ad hoc expert working party (the composition is given below) was set up in March 1975. These experts, nominated by the national delegations to the Working Party of Senior Officials on Data Processing set up by the Commission to help it in defining a sectoral policy, were requested to centralize for their own countries all the data required to provide a homogeneous consolidated basis for assessment of the present situation and the foreseeable evolution of the Community data processing industry and market.

Without going into detail (more precision will be given in the conclusions to the study), it was found that :

- (a) where the information existed, it was collected and classified in different ways from one country to another, so that the compilation of data on identical bases would have involved a volume of work out of all proportion to the working party's facilities (e.g., number of computers installed in the Community);
- (b) for one of the fundamental aspects of the computer industry (major computer manufacturers), basic data on some of these manufacturers, European-based or otherwise, was not available for a variety of reasons that can easily be imagined \* ;

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\* A survey in the industry, launched in 1975 (based on the collection of data by each expert in the working party at member country level for national industries and by the Commission for multinational companies), furnished very incomplete information on which it was not possible to base a consolidated review.

- c) for other aspects (e.g. software industries and services, peri-informatic sector comprising peripherals, minicomputers, terminals and other intelligent devices), the difficulty mentioned in (a) was complicated by the fact that some Member States had no information on their own industry;
- d) the data from studies of various origins in the Commission's possession often differed very greatly - if indeed they were comparable.

In view of this situation, further complicated by the reluctance of the member countries to supply certain data, the Commission staff considered it inadvisable to produce without comment a report that would be of doubtful value and at best an updating of numerous studies produced by specialist firms; they felt it more efficient to define the problem of collecting the missing data while setting out the information available.

One of the results of this study, therefore, is to demonstrate the main shortcomings in the way of information at Community level on the data processing sector; a joint effort must be made to remedy these if it is to be possible to follow the effects of a sectoral policy and review this policy as necessary.

It is striking to note, for example, that on the American market, information on which is incomparably better than that on the European market, financial analysts consider that they are poorly informed by the firms, especially IBM\*. Estimates are not sufficiently well founded and do not encourage financial circles to introduce investment plans; this situation, which also discourages companies from entering the sector or from consolidating, is even more true for Europe.

It must therefore be stressed at once that to be viable a Community programme, whether it relates to the profitability of the industry, the promotion of applications or the circulation of data throughout Europe, calls for a concerted effort to define, collect and process consolidated data giving a realistic and reliable picture of conditions on the internal and external market and their evolution with time on equivalent bases.

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\* Evidence given by Mrs M. Walter-Carlson, Research Shareholders Manag. Co. Doc. Chap. 1, pp. 5413 ff. Hearings before the Subcommittee on Antitrust and Monopoly. United States Senate Second Session, Part 7, The Computer Industry, July 1974.

This means that this study, reporting on the shortcomings, should not be a one-off effort, but the very first stage in a continuous project, accompanied by the necessary means to ensure that its annual updating will gradually provide an increasingly clear Community and world picture of the industrial situation in the data processing sector.

At the present time, at Commission level, only two sources are regularly produced and form a starting point :

- Statistics on Community exports and imports published each year by the SOEC and based on the NIMEXE classification, which itself shows inaccuracies as regards data processing (see Annex I, Tables 7).
- The study, updated annually by the CREST Subcommittee on Statistics, on public R&D funding in the Community countries, which up to 1974 gave only very general information that is almost unusable as data processing appears under a single code heading together with automation (see Annex, Tables 6.15 a and b). Since 1975, a new classification has been in use and this will allow hardware and software costs to be separated up to a certain point.
- With regard to the Community's internal production statistics, a study group has started work under the auspices of the SOEC to redefine a more suitable coding system than those currently in use (ECT, NIMEXE).

An attempt will be made to outline in conclusion the additional efforts that should be initiated in order to establish a number of economic, technological and social indicators able to provide valid guidance for and monitoring of future activities.



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CHAPTER I

General

1. Plan of the study in terms of the structure of the sector.

To meet the requirements of the study, the following subsectors have been distinguished despite the overlapping of activities :

- Computer manufacturers (large and medium-sized computers), Chapter II
- Software and data processing services, Chapter III
- Peri-informatic sector (peripherals and terminals, data preparation equipment, minicomputers), Chapter IV
- The impact of the industry producing advanced components and more particularly integrated circuits on the sector as a whole, Chapter V.
- Chapter VI gives information on aid granted to the sector in Europe and the rest of the world.
- Chapter VII outlines the main social problems arising from the development of data processing.

The remaining work necessary to complete and update annually the present study is described in the conclusion.

- Finally, the Annex gives the main statistics that have been collected and compared.

In the field of large computers, the recent agreements setting up the CII - Honeywell Bull Group have led to the disappearance of Unidata<sup>7</sup> (see Chapter II). The European-based manufacturers of central processors therefore comprise the firm ICL (UK), the Computer Department of Siemens (Germany) and the CII-HB Group, as Philips has transferred its large computer activities to Siemens.

The placing of peri-informatic equipment in a separate subsector is justified by the growing importance of distributed data processing which will play a leading role in the future use of EDP.

The distribution of intelligence in terminals and minicomputers will necessitate the development of network information systems, the spread of data preparation on the spot and the shared use of data bases.

As for software, the need to make users more independent of hardware suppliers and to increase trade calls for effort to secure product portability whenever possible.

In the interests of users, too, the desirability of increasing efficiency in the use of installations, which in many cases are operated at well below their theoretical capacity, makes it necessary to re-examine methods of programming and data base management. \*

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\* The arguments concerning these two points have already been developed in the Commission's proposals to the Council in Document COM(75)467 of September 1975; they will not be repeated in this study.

## 2. Increase in the applications of data processing, impact on the economy

Data processing is continuing to penetrate almost all industrial, commercial and social activities in the industrialized countries with a market economy and all the forecasts agree that this phenomenon will continue over the next five years and most probably for the next decade. This trend is even more marked in Europe than in the United States as a result of the technological and industrial advance of the latter; according to some estimates [1.7.] \* total data processing expenditure referred to the gross national product will more than treble in the Community countries between 1970 and 1980 whereas in the United States the expected ratio is 2.6.

However, the percentages themselves (from 1.5 to 3.2 % of the GNP depending on the country considered) appear to be grossly overestimated. Figures supplied by the French delegation from recent sources \*\* are 1.71 % in 1975 for the United States (or 1.77 % including terminals) against 3.2 % (Euroeconomics study) and 1.4 % in 1975 for France against 2.45 % (Euroeconomics study).

There are no precise data available on the relative position of data processing compared to other sectors in the industrialized countries. In 1973-74 [1.16 - 1.17] approximate figures put the European computer industry between aerospace and the iron and steel industry. However, judging from the estimated growth rates of the computer industry, it could draw close to the steel industry by the end of the decade and possibly even catch it up in the United States. A recent DAFSA study \*\*\* pictures the state of chaos in our countries if all computers were put out of service :

disruption of air, rail and urban transport, of banks, stock exchanges and social security, serious disturbances in industry (automated production lines), commerce (management), postal and telecommunications services and, even more ominous, the impossibility of controlling offensive and defensive nuclear weapons.

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\* The figures between square brackets in the body of the text refer to the tables and information with the same reference number in the Annex.

\*\* IDC estimates published in O1 Hebdo Informatique of 31 May 1976.

\*\*\* L'industrie de l'informatique dans le monde - DAFSA study. Collection Analyses de Secteurs - Paris - 2nd quarter of 1976 - This study, published just as the present work was completed, contains a comprehensive collection of complementary information.

### 3. Volume of the world market

To assess the volume of the data processing market, it is not enough to consider purchases from the industry, which in the United States and in Europe represent only 46-47 % of total expenditure by users; the remaining expenditure consists of internal costs (payroll and payroll costs, including internal software) estimated at 40-46 % and purchases from other industries [1.3.7]. A study by Euroeconomics evaluated the world market (total expenditure) at \$ 57 000 million in 1973, 55 % in the United States, 26.4 % in Europe and 7.7 % in Japan [1.1.7]. However, if other studies are examined, this appears to be an overestimate. A recent study gives the figure of 5 500 m u.a. for Europe in 1974 (purchases from the industry) and predicts that this will double in five years [1.4.7]. If **total user expenditure** is taken into account [1.3.7], the global market in 1974 in the Community of the 9 was about 13 000 m u.a. In any case a proportion of 1 to 2 for the respective markets of Western Europe and the United States appears acceptable.

#### 4. Growth rate

In the Community, the average annual growth rate for the next five years is estimated at 13 % [1.8], with a maximum in France (15 %), and substantially greater growth in the peri-informatic (minicomputers 17 %, peripherals 15.5 %) and software (16 %) sectors than for computers and systems (10.5 %). \*

It is true that the methods of using data processing are continuing to develop and that a real nervous system for information is becoming established; this necessitates the development of data transmission networks and the connection of numerous users by way of terminals which come under the peri-informatic sector. Distributed systems could account for up to 40 % of the systems installed by 1985 [1.10], with intelligent systems showing the highest growth rate at about 22 % per annum.

In the United States, the Department of Commerce puts the annual growth rate of the sector up to 1980 at 10 % and forecasts annual deliveries totalling \$ 17,100 million at that date. However, from 1974 to 1975, this rate was still estimated at 14 % (\$ 11 million in 1975 against \$ 9.6 million in 1974).

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\* In the SOBEMAP study (see note p. 16) from which these percentages are drawn, the term "system" (integrated or not but sold as a package) means a complete installation, comprising a central processing unit and all the peripherals necessary for its use; mini and micro-computers (sale value less than 42,000 u.a.) are considered separately.

## 5. The position of IBM

In 1974, IBM was established or represented in 126 countries. It employed throughout the world 274 000 people, 122 000 of whom for the World Trade Corporation (more than 44 %). Its turnover per employee was \$ 43 410 in the United States and as high as \$ 70 770 in France and \$ 74 870 in Federal Germany\* .

Even in 1973, according to a study for the IMF\*\* , for each dollar of net profit after tax which the work of one American employee yielded for IBM, the company received \$ 1.47 from the work of a foreign employee.

Its world turnover in 1974, which was \$ 12 700 million, was higher than that of its five main rivals taken together [3.3], and its net profit outside the United States in 1975 accounted for 55,6 % of its world profits, whereas its turnover outside the United States for the same year was only 50,4 % of its total turnover. \*\*\*

This situation may be attributed to the remarkable efficiency with which IBM has adapted its methods of management, production and marketing to all the countries outside the United States. It can also be maintained that a freer rein is given to competition in the United States than in Europe where users are less organized and less powerful.

IBM has activities in all the branches of data processing described below. In areas such as data transmission networks, including telecommunications and satellite systems, systems development, the growing importance of the main aspects of "peri-informatic equipment (IBM 32), the design and distribution of programs or the development of advanced electronic circuits, IBM plays a leading role in design and manufacture.

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\* Source : Annual Reports.

\*\* International Metalworkers Federation, Geneva, 24-25 October 1974.

\*\*\* Information supplied by the French delegation.

CHAPTER II

HARDWARE INDUSTRY

(Large and medium-sized computers)

1. Sources of information

A survey carried out in 1975 by the study group responsible for collecting data in support of this report produced no useful results.

Of the fifteen companies questioned in Europe, in spite of the arguments put forward by the experts of the group and the Commission, six did not reply and four gave very brief answers.

The Commission therefore used the companies' annual reports to prepare data given in Annex . It will be seen [3.1, 3.2] that better information is available on the American industry than on the European industry, on which some global basic data is missing.

2. The major computer manufacturers

The world computer industry is still dominated by American firms; about 78 % by value of the computers installed in the world at the end of 1974 were of American origin [2.1], while the products of European manufacturers accounted for only 5.8 % against 4.7 % for Japanese companies. The share of IBM alone was 56 %, followed by Honeywell with 8 % and Univac with 6.5 %. Considering that the turnover of these companies outside the United States is almost as high as that on American territory and that the proportion of declared profit is greater [3.3], it is obvious that their international activities contribute towards their success.

Since General Electric's computer stock was taken over by Honeywell in 1970 and RCA handed over its data-processing activities to Univac in 1972, six firms have shared the world market for large systems : IBM, Honeywell, Univac, Control Data, Borroughs and NCR. These two take-overs did not fundamentally affect the shares of the market in the United States [3.4].



Then come the Japanese producers (in particular FUJITSU), and the British firm ICL, whose share of the world park in 1974 (3.14 %) was greater than NCR's [2.1\_] in spite of a much lower turn-over [3.2\_].

IBM's share remains unchanged as does that of Control Data; the latter's substantial increase in "peripheral" activities has made up for a certain decline in central processors.

Honeywell regressed slightly in 1973 while Univac has declined more steadily apart from the abrupt change with the take-over of RCA.

NCR has remained steady since 1970. Only Burroughs has shown regular progress.

### 3. Economic and financial situation of the main world companies

A study now being published\* makes an economic analysis of twenty-one of the main world companies having a total turnover in 1974 of \$ 33 600 million; this is based on the annual reports of the companies concerned.

The sample\*\* does not include several European-based companies in the sector, in particular the computer departments of the multinational companies Siemens and Philips, which limits its scope in the Community.

The analysis is based on a group of indicators (costs and charges, management, growth, financing, R&D) some of which should be viewed with caution. Assuming that the values and ratios given are valid, some comments are called for :

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\* L'industrie de l'informatique dans le monde - Chapter 8 -  
DAFSA

\*\* Constitution of the sample :

United States : IBM, HIS, NCR, Burroughs, Univac, CDC, DEC, Hewlett-Packard  
Europe : Honeywell-Bull, CII, ICL, Nixdorf, IBM-F, IBM-D, IBM-UK,  
IBM-NL, IBM-I  
Japan : NEC, Fujitsu, OKI, Nippon-Univac

- Most of the indicators \* supplied give IBM a more favourable position than its American rivals and its European rivals compared to its European subsidiaries.
- For most aspects, disregarding size, the best-placed American rival of IBM is Burroughs and the worst-placed in the sample is CDC. The favourable position of Burroughs for the future is confirmed by a number of specialized studies in the United States.
- The average growth and R&D figures for the European companies included in the sample are higher than or equal to those of the American companies; it is the management and financing indicators that are less favourable. It is clear in particular that CII's current problems are reflected in this. As for ICL (like CII), the figures given do not take into account government subsidies which would reduce the indicators to very much lower values.

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\* The indicators used are defined in the statistical annex (in the notes preceding Tables 3.6 and 3.7).

4. Position regarding agreements concluded in the Community

The agreements between the companies Philips, Siemens and CII in July 1973 on the foundation of Unidata were of short duration. In 1975, the French Government negotiated an agreement with Honeywell on the merging of the data-processing activities of CII and Honeywell-Bull.

The merger covers Honeywell-Bull's assets and a part of CII's assets and does not include the Toulouse and Andelys factories, nor the perinformatics activities of CII which will form a separate group.

The information note from the French Ministry for Industry and Research indicates that the aims of the agreement are to give France a major and competitive computer industry by reorganizing French potential in order to establish the leading group in Europe on the basis of an international alliance that will open up the American market to it.

The agreement is described as a French take-over of Honeywell-Bull and then its merger with CII. 53 % of the capital will be held by French shareholders (against 34 % previously for Honeywell-Bull). The new group CII-Honeywell-Bull will represent (1974) a turnover of FF 3 500 million (32 % of the total turnover of the French computer industry) and 27 % of the installed computers, with a staff of 20 000. The X-4, X-5 program of CII will be continued, the aim being to define a line of unique compatible products.

The new company will decide on its products. The budgets for the studies will be equally divided between HIS and CII-HB. The data-processing activities not covered by the group (specialized data-processing, perinformatics activities and production of the factories not included in the agreement) will be managed by Thomson-CSF.

The financial commitment by the French Government is substantial :

- purchase of HB shares                      FF 130 million
- subsidies up to 1979                      FF 1,200 million
- possible capital increases
- target of public sector orders to a net value of FF 4,050 million up to 1979.

If actual orders are lower than this, a proportional increase in the support could be made.

These measures are planned with a view to all government support ceasing in 1980.

A direct consequence of the new CII-HB agreement is the dissolution of Unidata. Philips has decided to leave Unidata and to transfer its large-scale computer activities to Siemens, which will result in redundancies of 2 000 to 2 500 people.

The directors of Siemens have stated that the new group is not a possible partner but a massive rival and that Siemens will henceforth go it alone, but without trying to cover the full range of requirements. Its aim is to make its data-processing activities profitable by 1980.

It should be noted that Siemens recently decided not to buy the X 4 and X 5 computers of the CII series now in preparation, which means a loss of outlets for the new French group and competition at European level between similar systems, since Siemens' future computers can benefit from the common bases that were being established when Unidata was started.

5. Financing methods\*

Three financing methods are available to users : purchase, a contract with a leasing company or rental.

For the Community countries taken together, the breakdown is as follows :

	<u>Computers</u>	<u>Mini and micro computers</u> (purchase value less than 42 000 ua.)	<u>Peripherals</u>
Rental	71 %	5 %	7 %
Purchase	22 %	60 %	70 %
Leasing	7 %	35 %	23 %

N.B. Software is almost always sold.

The rental system was of course imposed by IBM and has had to be adopted by its competitors in view of its advantages for customers. Today, it represents 75 to 80 % of deliveries depending on the Member State concerned, except in the United Kingdom where purchase and leasing are more developed, in particular in government departments.

Purchase is the most widely developed system in American government departments; it accounts for almost 70 % by value of hardware procurement and the same percentage of central processors [6.19].

Even in the private sector, the proportion of rentals in America was 43 % (in value) at the beginning of 1974 compared with 55 % in 1970. This indicates on the one hand that the American user is better able to estimate his future requirements and consequently tends to keep his hardware longer, making it more advantageous to purchase, and on the other that the leasing function has been taken over by independent companies, whose rented installations appear as purchases at manufacturer level.

In the peri-informatic sector, there is a growing trend towards leasing at the expense of purchase. However, the leader in the mini-computer field (DEC) encourages purchase.

\* Source : Etude des besoins concernant le financement de l'industrie du traitement de l'informatique en Europe - SOBEMAP - May 1975.

CHAPTER III

THE SOFTWARE AND SERVICE INDUSTRY

1. Classification

Before embarking on an analysis of the situation of the world and Community industry in these subsectors, it is essential to stress the need for a classification of these activities. They are extremely varied and the studies on them do not organize them in a uniform fashion; moreover they are not all found in all cases. The following provisional classification is proposed as a basis for discussion with a view to establishing a classification that will if possible be accepted at Community level so that later statistics will be more readily comparable.

It appears artificial to draw a sharp line between services and software projects which are often complementary activities of the companies. It would be better to distinguish between data processing services proper and "environmental" services, which could be classified as follows :

A - Data processing services

- Data processing
  - . batch processing by service bureaux
  - . distributed data processing - timesharing
    - teleprocessing
  - . data preparation
- Software
  - . systems engineering
    - systems and program products (basic and utility)
  - . applications and program products
- General
  - . facilities management (turnkey projects)

B - Data processing environmental services

- Consultancy, assistance, studies
- Hardware and product maintenance
- Leasing and sale of second-hand machines
- Training
- Security of installations
- Performance checks

## 2. The world market for data-processing services

The United States has the leading world industry for data processing services, its turnover in 1974 excluding manufacturers being \$ 4 000 million \* It is followed by Japan with \$ 600 million, France with \$ 530 million, Germany with \$ 380 million and the United Kingdom with \$ 270 million. Public demand in the United States accounts for 40 % of the turnover. It has thus contributed to both the development and the evolution of this sector : the rapid growth in facilities management is due to the systematic use of this formula by Federal agencies (NASA, Department of Defense, etc.); the same may be said of remote processing, use of which by large government departments has helped to finance the appropriate basic software. This policy has been followed by the large firms in the private sector, which has helped to strengthen these trends.

For this reason the large American service bureaux tend to seek a global approach involving the setting up of data banks, basic and applications software and communications media for the marketing of distributed data processing. <sup>In the short term,</sup> this trend is favourable to IBM as it has activities in all the areas mentioned. However, it remains a potential element of competition which could be supported and developed, particularly in Europe.

As for the Japanese service industry, after a difficult start owing to the shortage of qualified personnel, the absence of major national programmes and the supremacy of manufacturers, it has been growing very rapidly in the last three years (60 % per annum since 1972) thanks to the support policy adopted by the government.

Under the current data processing plan (1976- 80), the Japanese Government had granted a subsidy of 7 500 million-yen to the service industry. Three months after the measures to protect hardware were abolished, Japan ceased to protect software (1 April 1976), thus opening the way to completely free competition on the Japanese data processing market. This was the date of the formation of a software company in which 17 Japanese companies participate; it will benefit from the above-mentioned subsidy to enable it to design a large-scale data base module and its program generator.

\* Source : CAP/SOGETI quoted by O1 Informatique - N° 96, Jan./Feb. 1976



One phenomenon peculiar to this industry in the countries mentioned is the existence of a captive market owing not only to the activities of the major manufacturers but also to the proportion of turnover accounted for by service bureaux with their parent company or the body which controls them.

According to some estimates, this captive market represents 24 % of the total market in the United States and an even higher percentage in Europe. One fact illustrates this situation well : the complaint filed under the anti-trust law by ADAPSO, the association of American service bureaux, against the banks which are said to control one quarter of the market for data processing services.

At European and world level, therefore, one of the main structural problems of the services market is that it is supplied by three sources, only one of which is independent :

- the large computer manufacturers, especially IBM, which controls more than half the market for program products and remote processing, and the conditions are ripe for it to strengthen this position in the future;
- the main users (companies or bodies) which develop their own services and software and then market them either directly or through a subsidiary;
- the independents who can only strengthen their position between these two categories by advanced specialization and/or by acquiring a sufficiently large dimension.

The influence of the public sector in the main countries of the world is shown in Figure 1.15 which indicates the overwhelming role of the American Government considering the size and homogeneity of the market in the United States. It may be observed that in Europe the public authorities in France and Britain control comparable proportions of the market (34 and 27 %) whereas the figure is much lower in Germany (about 11 %), and these proportions correspond at least to the order of importance of their respective markets.

Statistics on this sector must be regarded with caution, for the reasons that have just been outlined (uncertain definitions, captive market, activities of manufacturers and users) to which should be added, with certain exceptions, a superficial or non-existent knowledge of national activities at government level. Considerable information work must be done in the Community in order to obtain a clearer picture. \*

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\* Mention may be made, for example, of the critical reactions of the Computing Services Association (CSA) in the United Kingdom to the first version of a document from the Department of Industry concerning a policy for the software industry; this led to the decision by the CSA to initiate a study - now in progress - on the services industry. (Computer Weekly N° 468, 23 October 1975).

### 3. The European market for software and services

Statistics based on purchases by industry [1.4] do not give a precise idea of the market for services if account is taken of expenditure by users. A very recent study \* gives for the main Community countries in 1975 an expenditure exceeding \$ 1 800 m [1.12] and forecasts that the market will represent more than two and a half times this figure in 1980.

The growth of this sector is estimated at 30 % per annum.\*\* It is expected that the proportion of batch processing by service bureaux will decline as more and more clients make use of distributed data-processing services while others procure minicomputers, which could bring the growth in these services to 40 % per annum.

The success of small machines, typical of which is the IBM 32, will be combined with the development of data-processing networks; it is predicted (Chapter IV) that there will be a great expansion in intelligent terminals which the user can program and use in interactive mode or for remote batch processing; this type of use will be operated by the service industry.

Facilities management (turnkey services) which currently account for only a modest proportion of the market in Europe (\$ 64 m in 1975 for Western Europe [1.14]) is experiencing spectacular growth in the US [1.11] and it is expected that the economic climate will encourage European clients to make increasing use of this type of service which is easier to control.

The development of services based on remote processing is at present restricted in Europe by the high cost and low availability of networks, together with the compartmentalization of the market caused by national frontiers.

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\* Scandinavian Computer Services industries analysis 1975 - Quantum Sciences.                      annual

\*\* Compared with the growth rate for software of 16% given by the SOBEMAP study (Chap. I.4).

Projections for software development [1.14] predict growth equal to that of data processing services as a whole, with services having some advantage over products. As standardization is less advanced in Europe than in the United States because of the special features of national markets that are relatively small in size, the production of "tailormade" software will probably remain one of the main activities.

However, systems engineering should gain in significance in view of the rapid growth of the market for small "turnkey" systems and the substantial investment in automation in telecommunications and in networks.

#### 4. The problem of legal protection for software

The studies on this subject conducted by the Commission are not recent, but it seems that no significant progress has been made since\* . The question has been under study for more than ten years in both the United States and Europe. The only real conclusion at the present time is that neither the conventional patent nor the copyright can be adapted to protect computer programs.

In the United States, after programs had been ruled to be unpatentable in 1968, the Patent Office reversed this decision the following year, but without defining the form to be used to register programs. The Copyright Office accepts such programs for registration but as yet there has been no court decision to clarify whether they are effectively protected by the copyright law.

In the Community, only France has specifically ruled that programs are not patentable (patent law of 1968). In the other countries, programs are not patentable in principle but the granting of a patent depends largely on the way in which the application is drafted.

At international level, neither the Strasbourg Convention nor the European Patent Convention provide for the patenting of programs. Apart from private contract law, the only existing protection is legislation on trade secrets and unfair competition.

In fact, the problem appears to be limited to applications programs, the operating system (monitors, supervisors, service routines) benefits from relative automatic protection due, for certain elements, to a close dependence on the hardware, and if precautions are taken compilers can be protected up to a certain point.

On the other hand, without legal protection application programs can easily be recopied and there is in fact constant piracy which obliges the designers of such programs to seek rapid profits; the capital cost (which can be

\* Source : Internal Commission studies (DG XIII), 1972.

A seminar held in London on 18 March 1976 on the subject did not, as far as we know, yield any information on possible changes in the laws.

very high) must be paid off in two to three years. Action is therefore necessary in this regard.

WIPO (World Intellectual Property Organization) is studying the problem; a committee of experts set up recently will study all possible forms of protection

- against unauthorized use
- against translation into another language

and will examine the questions of registration, ownership and ways of uncovering fraud. \*

Even if this work has a successful outcome, the problem of the establishment and Community harmonization of national laws would remain.

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\* Cf. the report of the non-governmental experts consultation group which met at Geneva in June 1974, published in the WIPO review *Industrial Property*, August 1974 edition.

CHAPTER IV

THE "PERI-INFORMATIC" SUB-SECTOR

1. Definition

Given the extension of distributed computing and the fact that the industrial subsector that has recently been named "péri-informatique" in French-speaking circles can up to a certain point be considered distinct from the large computer industry, it seems appropriate to study it separately. A first difficulty arises in defining it. It includes :

- (a) manufacturers of large systems, who supply complete systems including ~~conventional~~ near-in peripherals (magnetic tape units, discs, printers) some of which are bought in from the OEM (Original Equipment Manufacturers\*) market ;
  
- (b) the more specialized industry involved in the manufacture of
  - mini and microcomputers
  - "compatible" peripherals, competing with the units incorporated in their systems by the manufacturers
  - interactive terminals (keyboard and printer, keyboard and screen) or batch terminals (simple, multi-function or heavy)
  - data acquisition equipment (punches, magnetic or optical readers, industrial or banking data collection, etc.) ;
  
- (c) service companies who supply specialized software or who use the above products "turnkey" installations (facilities management).

This section considers in particular the activities covered by (b), the other activities being commented upon as appropriate in the corresponding Chapters (Chapters II and III).

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\* that is to say the manufacturer acquires from specialized firms complete units (for example peripherals) which he incorporates into his system when he markets it.

## 2. World market

If the captive market is excluded, that is to say equipment sold by the large-computer manufacturers as part of their systems <sup>+</sup>, the worldwide turnover of the subsector in 1973 was, according to an estimate of the French Ministry of Industry, 5,000 million u.a. , and it is forecast that this figure will be quadrupled by 1980 [4.1.]

The same source forecasts for 1978 [4.2.] a higher percentage for Europe and Japan than in 1973.

Estimates of the growth rate vary according to different sources from 16 to 23 % per annum in the next few years; it remains in any event greater than the average rate of growth estimated for the total data processing sector.

A study recently carried out for the Commission <sup>\*\*</sup> indicated that this rate will be greater for the "intelligent" systems, some 22 % per annum, and that amongst these the systems with the most rapid growth will be :

- point-of-sale terminals
- intelligent terminals based on micro-processors
- multi-processor minicomputers.

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\* Although it is difficult to evaluate this captive market some idea of it can be gained from the peripherals (tape transports, disc units) "compatible" with the IBM 360 and 370 series, for which IBM maintained 76.4 % and 78.7 % respectively of the United States market at the end of 1972 (source : Report by the French Embassy in Washington), the total amounts being \$ 276 and \$ 522 million.

\*\* L'industrie européenne de la péri-informatique, SEMA, April 1976. Confidential study.



The average rate of growth for "non-intelligent" systems will be around 15 % p.a., with a more rapid growth for

- floppy discs
- printers
- badge readers
- mass memories

Unlike large scale data processing, no marked domination of one firm can be found in the peri-informatic sub-sector taken as a whole. It appears on the contrary that the big companies have some difficulty in mastering the situation created by the broad spectrum of products.

In each of its constituent segments, however, one or several leaders can be found tending to dominate that particular segment, such as Digital Equipment for mini-computers, Memorex and Control Data for memories, MDS and CMC for data acquisition.

Manufacturers of large systems are also important suppliers of peri-informatic equipment (notably near-in peripherals and general purpose terminals); IBM is still the leader but all the others together supply about 7 % of the market.

At the world level, the market is still dominated by American firms, with a share of more than 70 %. The recent entry of IBM into this market and the Company's interest in it constitute an essential factor in the evolution of the sector; since 1973 it has been endeavouring to acquire a substantial share, notably in data acquisition on magnetic media (launching of floppy discs), in terminals and minicomputers (IBM 32).

### 3. The European industry, strengths and weaknesses

Only 44% of total demand on the Community peri-informatic market was met by the European-based industry in 1974 [4.9.]. However, it is necessary to consider the various segments of the market, in which the position of this industry varies considerably.

- (a) The market for local computer peripherals is covered to the extent of more than 80 % by American imports, of which about 50 % are supplied by IBM which covers the entire range of products. One must

also note that many European products, particularly discs, are manufactured under licence [4.3.].

European industry is therefore in a very weak position in relation to demand; local computer peripherals have a growing importance by value in systems, and the competitive position of a system manufacturer who depends on a single non-European supplier for his peripherals is more easily threatened.

- (b) Almost 50 % of the requirements for universal terminals is met by European manufacturers [4.4.]; here the position gives less cause for concern, even though some work under American licence, and certain component parts of the terminals, such as the keyboards, are American. Mention should be made of the extensive requirements resulting from the development of networks, and the important part played by orders from public and semi-public bodies for their own systems, which could help to redress the situation, as there is no danger of a notable lag in Europe in the designing of systems which use a large number of universal terminals.
- (c) in specialized terminals (banks, point-of-sale, factory, etc.), the Community covers almost 70 % of its requirements [4.5.].

This is due to the fact that close cooperation with users is essential for their development and certain applications, such as banking terminals, are not very highly developed in the United States.

The weak point of the European industry is in the point-of-sale terminal, where a large part of the market, after its abandonment by Olivetti, is now likely to be divided up between NCR, and probably IBM if the latter decides to exert its weight in this sector.

Finally, it is clear that the position on domestic markets is good but the specific nature of the applications limits intra-Community trading.

- (d) In data acquisition the European industry's contribution only amounts to 34 % and is therefore small [4.6.]. In particular the share of the market held by American producers in multi-keyboard data acquisition units (INFOREX, CMC, MDS) is 77 % and if licences are included, it rises to

98 %. Furthermore, the appearance of the floppy disc will still further reinforce the advantage of the American manufacturers.

- e) About 50% of Mini computers for industrial and scientific use are supplied by European manufacturers, taking central units as a basis only [4.7]. This is a favourable situation as all the European manufacturers also operate as suppliers of systems (and there are practically no American licences worked in Europe) whilst the Americans sell principally as OEM. However, intra-Community trading still remains small.
- f) Small business systems form the segment of the peri-informatic sub sector where Europe has the strongest position. West Germany in particular is the only Member State where peri-informatic exports are larger than imports [4.8]. The French industry was the least well placed in 1974, but a definite improvement has been observed since. The United Kingdom market was comparatively weak in 1974 (70 m.u.a. against 144 for West Germany) and the Community share limited; the success of the ICL 2903 computer should improve this share. The Netherlands (Philips) and Italy (Olivetti) are also active in this sector.

#### 4. Development forecasts \*

Given the extension of the use of data processing, tending to become widely-used and commonplace tool, the preponderant role of peri-informatic equipment in this development is clear from the following trends :

- at the general level, intelligence will be distributed within the systems;
- the acquisition of data will be effected at the place of origin;
- data will be centralized (by virtue of the integration of distributed sub-systems in one system)
- concurrently, access to data will be by teleprocessing networks to be set up or developed.

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\* As quoted in the SEMA Study.

The following can be foreseen for hardware :

- the eventual abandonment of card systems
- the use of new storage techniques (floppy discs, cartridges)
- the development of new types of terminals, particularly conversational terminals
  
- a standardization of hardware, made possible by the use of micro-programming and the massive usage of micro-processors.

Equipment will then be separated into "intelligent" units having a processing capacity which will allow them either to relieve the central unit of certain tasks or to operate on a stand-alone basis), and non-intelligent, the latter comprising mainly memory units, universal terminals, printers, etc...

#### 5. Policies of support for peri-informatic sector in the Community

Under their national policies (as set out in Chapter VII) two Member States have a declared plan of action for the peri-informatic sector.

France has announced a peri-informatic plan which should come into force in 1976, the broad lines of which are as follows :

- supply policy : the government measures will not be on a preferential basis but will be concerned with :
  - (a) an information effort, aiming to improve the image of the industry and to disseminate systematically the requirements of public purchasers to French-based manufacturers.
  - (b) separate tenders for central processors on the one hand and peripherals and terminals on the other at the level of public purchases.
  - (c) encouragement of purchase or rental at this level.
  
- Research & development
  - a) work on components (integrated circuits, memories, specialized circuits)
  - b) adaptation of computer-aided design techniques and system architecture studies.

(c) development of standards and standard interfaces.

- Financing

- (a) support for the creation of leasing bodies
- (b) direct support : grants to firms which adopt growth aims, and development aid in the form of loans repayable in the event of success on a shared-risk basis (50 % maximum of the total investment).

Finally, IDI (Institute of Industrial Development) takes temporary holdings in small- and medium-sized firms, as in other sectors.

Under its third computer programme, the Federal Republic of Germany has also made provision for the support of industrial R & D, several sections of which relate to the peri-informatic sub-sector [6.1] an amount of DM 63 million is earmarked for subsidies for remote peripherals, the annual figure increasing from DM 10 million in 1976 to DM 20 million in 1979. Small systems (including process control computers) will receive an overall subsidy of DM 149 million, increasing from DM 30 million in 1976 to DM 49 million in 1979. Near-in peripherals are not omitted from the subsidies to large-scale data processing.

There are also plans to encourage companies to cooperate closely in development by launching a selection of applications projects based on integrated systems, so as to promote the development of hardware for distributed computing.

It will also be remembered that Germany's component plan takes account of the requirements for the future development of small systems.

In short, it is fair to say that despite the support for peri-informatic equipment given or planned by two member states, near-in peripherals and data preparation systems are at present the two weakest points in the European industry.

Mention should also be made of the low level of intra-Community trade, even in segments of the market where the European industry is better placed.

CHAPTER V

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IMPACT OF THE PRODUCTION OF INTEGRATED CIRCUITS ON THE DATA PROCESSING INDUSTRY

1. Situation

Active components, and in particular integrated circuits, constitute one of the stumbling blocks in the development of computer technology.

The pace of technological progress on circuits and on memories is very fast; in large scale integration (LSI), the number of transits per chip increases tenfold every three years,\* and total memory capacity doubles every two to three years. Core memories are rapidly succumbing to semiconductor memories and, according to some forecasts, will be superseded completely by 1977\*\*.

The world market for active components was more or less equally divided between discrete and integrated components in 1974. The EEC only produced only about one of its requirements of integrated circuits <sup>half</sup> [5.4, 5.5, 5.6] of which in turn one half was consumed by the data processing industry, compared with two-thirds in the United States [5.13].

Whereas the situation in the European industry is therefore reasonable for passive components, with variable degrees of profitability, the same is not true for integrated circuits. In spite of a competent technology (the lag behind American companies is estimated at two to three years) and considerable R & D, the turnover is well below requirements which will continue to grow.

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\* Programm Elektronische Bauelemente der Bundesrepublik Deutschland 1974-1978.

\*\* Trends in the integrated circuits industry - Arthur D. Little.

In this field, which is one of the keys to the future of the computer industry, American companies are in a very favourable position. As with discrete semiconductors, they use very cheap labour in the developing countries (in particular in the Far East) for the assembly of integrated circuits and the production capacity of these companies, together with very low customs tariffs, have enabled them to flood Europe with their products at extremely low prices. \ This further restricts the production (at a loss) of European manufacturers.

There are two main reasons for the low prices: on the one hand in 1970 the American Government drastically reduced its orders for the space and defence programmes, releasing a very large production capacity in American industry which has since then conducted an aggressive sales policy; on the other hand, the rapid increase in the efficiency of circuits, which permits the advanced integration of highly complex components, has coincided with a marked reduction in the price-performance ratio (in five years, the cost of a logic element has been reduced one hundred fold).

This situation is reflected in the EEC's trade balance for integrated circuits, which showed a large deficit in 1974, almost entirely to the advantage of the USA [7.7.]. A more rapid growth of integrated circuit consumption is predicted in Europe than in the United States, while the reverse is expected for production and this will aggravate the deficit. It is clear that the data processing industry is not the only user of advanced components and the disturbing fact of Europe's technological dependence will have consequences in other sectors (e.g. consumer goods, telecommunications).

## 2. Main world producers

Semiconductors are produced either by companies whose main activity it is, such as Texas Instruments or Motorola (US), or by firms which have major interests in other sectors but are also involved in data processing, such as Siemens (Germany), Philips (Netherlands), Hitachi (Japan), Toshiba (Japan) and NEC (Japan), or by firms which are active in other sectors and may or may not utilize their own semiconductors, such as General Electric (US), RCA (US) or ITT (US) [5.5.].

The importance of the role of advanced components for the future of computers and micro-processors is illustrated by the fact that manufacturers such as Texas or Fairchild have gone into data processing, whereas computer firms, such as Hewlett-Packard, have formed semiconductor divisions. The case of IBM which has become a major producer of advanced components, but solely for its own needs, will be dealt with separately. Other American industries, such as the ATT Group, whose main market is telecommunications, are following the same path .

### 3. IBM as a producer of semiconductors

Having lagged behind the technical development of advanced components in its successive generations of computers, IBM has now made up the leeway with the 370 series - it has used an enormous part of its R & D budget, estimated at US \$ 70 million, for the development of new components and circuits and is now considered as one of the most advanced producers. It is making advances, for example, in its semiconductor memory techniques (charge-coupled device or CCD) and, like the Bell Telephone Company, is preparing for a major breakthrough in the field of magnetic bubbles which will replace mass memories.

The drawback of such a situation is that, if its research bears fruit and IBM introduces sufficiently advanced technology into its next generation of machines to forge even farther ahead of its direct rivals, since its production is entirely "captive" other component producers would be unable to offer equivalent circuits to the rest of the data processing industry and IBM's dominant position in the world would become unassailable.



#### 4. European producers

The following European-based producers operate within the Community :

- The first is Philips (Netherlands) and its subsidiaries (turnover 1973: 325 million u.a.), which engages in integrated circuit R&D in the Netherlands (Nijmegen), Germany, United Kingdom, France and Switzerland and has an assembly factory in Formosa.

In 1975, Philips took over Signetics US in order to have access to the American market and <sup>it</sup> maintains contacts with General Electric.

- Siemens (FRG), the second European producer (turnover<sup>¶</sup> 1973 : 115 million u.a.), had signed licensing and know-how agreements with Philips in 1974, but the situation has been altered by Signetics entering the scene.
- AEG (FRG) (turnover<sup>¶</sup> 1973 : 80 million u.a.) specializing in micro-processors, has signed a know-how agreement with Rockwell and will be responsible for manufacturing some of the micro-processors.
- The production of SGS(I) (turnover<sup>\*</sup> 1973 : 85 million u.a.) which is active in Italy, the United Kingdom, Germany, France and Singapore, consists 50 % of discrete components and 50% of integrated components (equally divided between linear and digital circuits).
- The Thomson Group (France) (turnover<sup>¶</sup> 1973 : 70 million u.a.)
- Ferranti, GEC, Plessey (United Kingdom)
- Other companies have lower turnovers in semiconductors or passive components.

Then there are the European subsidiaries of American companies, namely Texas, Fairchild, Motorola and ITT which have, in general, established production and design facilities in several member countries.

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¶ This is turnover in semiconductors, not including the activities of subsidiaries.

Finally, the Japanese firm NEC has recently set up a subsidiary in Ireland, Cuminc and Stream, for the purpose of producing logical circuits and integrated circuits for storage devices.

#### 5. Gouvernement aids

In spite of the reduction in the defence and space programmes already referred to, the above mentioned American firms still receive substantial orders from these programmes and also from a very large domestic market.

West Germany is the only country in the Community to have a complete five-year programme for components [5.8] which was launched by the Ministry for Research and Technology in 1974 for an initial sum of DM 288.5 million, recently cut back to DM 260 million (85 million u.a.). Including the support from other programmes, particularly defence [5.9], the total aid averages DM 73 million or 24 million u.a. per year.

Most of the difficulties which the European component and data processing industries are having to combat are reflected in the reasons given for inaugurating such a programme, chiefly focused upon innovation and, more especially, on monolithic integrated circuits and opto-electronics.

France has no real component plan to speak of; aid falls into three categories:

- "concerted action" for industrial research (FF 15 million in 1975 for active components)
- development loans reimbursable on results (FF 8 million in 1975)
- contracts with government organizations - computer plan (budget of FF 20 million in 1975, only partially used)
  - PTT (amount not given)
  - defence (FF 100 million per year, of which 40 million are for active circuits).

Although not part of an official programme, total annual French aid is, therefore, slightly inferior to the German figure (FF 83 million or + 16 million u.a.).

In January 1973 the United Kingdom Department of Industry lauched a six-year micro-electronic programme for £10 million, involving contracts with three national companies (Ferranti, GEC, Plessey), with the aim of supporting R&D on integrated circuits; 30% of this is intended for data processing applications. The investments, which are reimbursable if successful results are achieved, curretly amount to £3.25 million, but the programme is under review.

On defence, the programmes on micro-circuits have a budget of the order of £1 million per year.

Finally, the advanced technology projects for computers account for approximately £0.15 million per year in this sector. Therefore, aid in the United Kingdom in this field can be estimated at around £1.65 million per year or 2.9 million u.a.

The other Member States have not made any special provision for aid in this sector. At Community level, the total amount of aid for advanced components can, therefore, be estimated at around 43 million u.a. per year. In Japan, an eight-year plan costing 70,000 million yen (200 million u.a.) has been put in hand by the MITI with a view to producing a series of computers based on the VLSI technique (Very Large Scale Integration).

To get an idea of the situation, a comparison can be made between these figures and the annual R&D budgets for semiconductors of some of the large American manufacturers, which ranged from \$ 7 million for Signetics to about \$ 90 million for each of the firms Motorola, Texas and IBM in 1973. [5.10]

CHAPTER VI

NATIONAL POLICIES AND PUBLIC EXPENDITURE ON

DATA PROCESSING

National aid

1. Four Member States (France, United Kingdom, Germany, Belgium) have initiated at short intervals a data-processing promotion policy which in three cases (France, United Kingdom, Germany) includes support arrangements for the national industry.

2. Although it is difficult to make a precise comparison of the budgets allocated by these States to support their policies in view of the differences in conceptions, it is clear that Germany has made the greatest effort to promote data processing with a total of DM 2,796 million for 1967-75, to which must be added part of the 1974-78 components programme launched by the Ministry for Research and Technology, under which DM 85.5 million are earmarked for the development of integrated circuits /6.1\_7.

A feature worthy of note is the attention paid in this programme to data processing training, which accounts for more than a third of the total.

3. Next come the French computer plans which account for FF 1,830 million in the same period (1967-75), not counting the data processing budget of the Centre National d'Etudes des Télécommunications (CNET), allocated FF 256 million under the Sixth Plan, nor the budget for data processing training, which comes under the Ministry of Education and is estimated (with reservations) at FF 420 million /6.2\_7.

4. In the United Kingdom, support has gone mainly to the national firm ICL, which has received about 66 % of the total amount of £61.46 million indicated by the Department of Industry for the period 1969-75 /6.3\_7.

Once again, the training budget is not included. Also, this figure does not include aid for regional industrial development nor expenditure on data processing R&D by government research centres.

5. In Belgium, state aid for data processing is of a different nature; the aim is not to support a national industry but to encourage European-based manufacturers to set up in the country with the dual aim of establishing industrial activities in computer hardware and creating jobs. The progress contracts signed with Siemens and Philips would represent in principle, according to a non-governmental source [6.4], a cumulative total, for each manufacturer, of Bfrs 975 million, making a total of Bfrs 1950 million for the period 1971-75.

A programme to encourage research in data processing launched in 1971 for which the universities have been made responsible has a budget estimated at Bfrs 285 million for the period 1971-75.

The other Member States have no specific programme of support for the data processing industry.

6. Overall estimate at Community level of the aid granted

All the budgets declared by government sources for the support of data processing under the past programmes outlined above amount to approximately 1 500 million u.a., of which 600 million u.a. is for support for the hardware industry. However, as the content and duration of the programmes are not comparable, a different method of evaluation will be used. As the four Member States have adopted programmes that are up to a certain point comparable for the period 1971-75 [6.6], an overall annual average of 183 million u.a. can be calculated, 101 million u.a. of which is for the hardware industry, leaving aside the training budgets. Using the incomplete data available for the latter, the annual average is 260 million u.a.

## 7. The situation in the United States

Complete data is not available on the amounts of the contracts concluded by the American Government with the data processing industry. The press<sup>\*</sup> puts general support for data processing R&D since 1965 at \$ 300 million per annum, or almost half the total R&D for the sector<sup>\*\*</sup>. However, according to the Institute for Defense Analysis [6.16], total data processing expenditure by the Department of Defense alone was between \$ 6 200 and 8 300 million for the 1973 financial year.

As the Department of Defense possesses almost half the computers in the public sector [6.17], a rough estimate of the United States Government's expenditure on data processing can be obtained by doubling these figures, giving an annual total of \$12-16 000 million. Moreover the Buy American Act gives American manufacturers a 50 % price advantage for defence installations, which rules out foreign participation (for civil expenditure the preference is only 6 %).

## 8. The support policy in Japan

To make up the considerable technological leeway in its computer industry, the Japanese Government has since 1958 instituted a number of coherent measures to protect the national market, such as :

- undertaking by foreign manufacturers to sell half their production outside the country,
- need for the agreement of the MITI (Ministry of International Trade and Industry) to the marketing of new systems,
- high customs tariffs on imports, 10-22.5 % depending on hardware,

(All these measures were abolished at the end of 1975 after pressure from the American Government).

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\* Computer Weekly, 12 April 1974

\*\* Gaps in technology - Electronic computers OCDE(1970) Table 24.

Financing aid has also been instituted in the form of a leasing company, the JECC (Japan Electronic Computer Company), backed by a bank, the JDB (Japan Development Bank).

Finally, a budget for subsidies and loans is granted each year. For 1975, it was equivalent to 87 million u.a. in subsidies and 151 million u.a. in loans [6.5(a)]7.

The national industry has been reorganized in two stages :

- in 1971, three groups were formed : Fujitsu-Hitachi, NEC-Toshiba and OKI-Mitsubishi, later merged into two
- in 1975, Fujitsu-Hitachi-Mitsubishi, NEC-Toshiba.

Over five years, subsidies to these six manufacturers amounted to 215 m u.a. The purpose of the above reorganization was to produce a series of computers based on the VLSI (very large scale integration) technique under a plan allowing for expenditure of 70 000 million yen (198 m u.a.).

This sum will consist of 30 000 million yen from the Treasury and 40 000 million contributed by the five companies\* .

As for software, the Japanese industry will have a subsidy of 7 500 million yen ( 21 m u.a.) over five years for the development of a data base module and its program generator; this subsidy is going to a new joint company combining 17 Japanese companies, the Kyodo Software Development Co with a capital of 500 million yen, the formation of which on 1 April 1976 coincided with the opening up of the Japanese software market to foreign investors.

As a result of these measures, which have enabled Japanese manufacturers to retain 56 % of the market up to now, MITI expects that they will continue to retain at least half of it in 1980.

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\* Source : The Japanese Office of Economic Studies : April 1976 Bulletin.

### 9. Public procurement and data processing

Of the computers in the public sector in the Community, those of European-based manufacturers accounted in 1974 for 44 % in Germany, 29 % in France (the 8 % of Honeywell-Bull being classified under American manufacturers at the time these statistics were published in France) [6.11] and 57 % in the United Kingdom. In this Member State, a single tender policy for public procurement has enabled ICL to retain a significant proportion (31,7 % in value at the end of 1974 - see Table 2.10) of the installed computers in the United Kingdom. In the case of Belgium, according to the theoretical bases for the progress contracts, the percentage of public installations going to Philips and Siemens should not be less than 50 %. These figures, in which national industries account for the lion's share, demonstrate the effort made by governments to support the European industry. The equivalent figures in the private sector at the same date were about 17 % for Europe as a whole plus 10 % for Honeywell.

Computers in the public and semi-public sectors in the United Kingdom, for example, account for 35 % by value of the total number of computers [2.10], of which 15.7 % come under the heading of central government. The latter figure is fully comparable with that for systems installed in the American Federal Government (15 %).

It may also be pointed out that the American Government has for ten years made a sustained effort to counteract the position of IBM, which in 1975 accounted for only 15.3 % of <sup>installed</sup> computers in the public sector [6.18] behind Digital Equipment and Univac. This shows that IBM is less well represented in the government sector in the US than in France (36 %), Belgium (31.9 %), United Kingdom (16,6%), Italy (69 % by number) or Denmark (85 %).

It has been shown elsewhere (Chapter III, section 2 and Annex, Table 1.15) that in the service industry the American Government is proportionally the largest customer on the national market and that it alone spends more than all the Member State governments taken together.

It is possible to obtain an overall idea of public expenditure on data-processing R&D in the Community, which amounted [6.15] to 273 000 u.a. in 1974. However, it is not yet possible to break this down into research on hardware and research on systems and software. A new classification will enable this to be done as from the 1975 analysis, for which some data is not yet known.



10. Policies in relation to competition

The effects of United States anti-trust legislation on the data-processing sector can be seen in the legal proceedings against IBM Corporation taken by the US Department of Justice. The first hearings of the case, which has required more than six years of preliminary investigation, have begun, and the advisability of breaking IBM down into several units has been raised by the Ministry. It comes after a series of legal actions by other companies (amongst others "plug-in-compatible" manufacturers) based on the same legislation with varying results. It can be seen, however, that this policy has already had regulating effects on the commercial attitude of the industry (such as the universal application of "unbundling" by IBM). The implementation of such a policy, together with the adoption of standards in the public sector, can therefore have a significant impact on industrial structures and in particular on the behaviour of IBM. In the Community, the Commission has also begun an inquiry into possible abuse by IBM of its dominant position.

CHAPTER VII

THE PROBLEMS RAISED BY DATA PROCESSING IN THE SOCIAL SECTOR

1. Effects of data processing on employment

In its document SEC(73) 4300 transmitted to the Council (which led to the resolution of July 1974), the Commission had already expressed its concern about the appreciable modifications that will occur in employment structures during the next few years as a result of the expansion of the data-processing sector, industrial adjustments and changes in the skills required. There are three main aspects to these problems :

- evolution of employment within the data processing industry itself,
- evolution of employment amongst users of data processing, especially as a result of the foreseeable advent of distributed computing which will facilitate the introduction of data processing into many branches of economic and social life,
- consequences of this evolution on training, refresher training and retraining.

There must be a detailed examination at Community level of all aspects of these problems, on which no more than piecemeal information is available at present.

Studies should be carried out in cooperation with both sides of industry in order to collect data and hold the necessary discussions so that the next updated version of this study can contain information on this important subject.

Going back to the first point made above, the recent CII-HB agreements, although not causing redundancies in the companies that merged, resulted indirectly in the disappearance of Unidata and the decision of Philips to give up its large-scale data-processing activities in favour of Siemens, leading to the loss of 2 000 to 2 500 jobs in the Netherlands (see Chapter II). There are also fears in Scotland that the merger could have repercussions on employment in Honeywell's UK computer operations.

## 2. University education and vocational training

Apart from the detailed data on specialist jobs given in Federal Germany's 3rd computer programme, the Commission has no general up-to-date information on requirements at Community level.

Two complementary approaches are being made to this problem :

- (a) The CREST specialized working party has for two years been sponsoring short post-graduate training courses in the form of concerted action projects. These courses, which last from one to three weeks and are intended to cover an advanced topic of data-processing research at the highest possible level, are organized by universities and institutes in member countries; the majority of the participants are from the organizing country but some also come from other member countries.

These courses have proved very successful. Fourteen were held up to the end of 1975 :

- seven in Federal Germany on five different subjects,
- three in France on the same subject,
- two in the Netherlands on two different subjects,
- one in the United Kingdom,
- one in Italy.

Five courses are planned for 1976 (two in the United Kingdom, two in France and one in the Netherlands).

The Commission is preparing a proposal to the Council on changes in the financing arrangements, whereby a common fund would allow greater flexibility of organization and more extensive exchanges of participants.

- (b) As part of the preparatory work for the operation of the Social Fund, the Commission's Directorate-General for Social Affairs organized in

December 1974 a seminar on training in data processing in the field of adult education. All the circles concerned in the Community were represented : government departments, training organizations, companies, trade associations and unions.

The main problem was found to lie in the area of training in the use of data processing (as opposed to the training of computer staff). Difficulties were identified in the unfavourable reactions of labour, within the organizations themselves and at the level of training proper.

Two kinds of activities concerning information and education were proposed at Community level : those intended for the general public and those specifically relating to employment and the working population. Three types of activities were considered :

- encouragement and coordination with a view to the introduction of data processing into the school system and lifelong education
- studies and experiments prior to the development of training programmes for teachers
- promotion of a policy of training in data processing for the working population.

### 3. Data security and confidentiality

In the same document (SEC(73) 4300) the Commission also drew attention to the importance and advantage of seeking a political consensus at Community level on this subject in order to introduce common ground rules rather than later having to harmonize conflicting national laws. The Commission had already contacted the European Parliament on the subject.

The Legal Affairs Committee of the European Parliament, after considering the matter, submitted to the European Parliament a draft resolution adopted unanimously on 21 February 1975 containing the following points :

The European Parliament :

- gives its approval to the establishment of a special committee of members of the European Parliament which shall be authorized to examine this problem and to consider proposals relating to :
  - (a) the methods of gathering personal information stored in data banks,
  - (b) the rights of the individual to see and dispute the stored information,
  - (c) the desirability of applying common standards to private and national data banks,
  - (d) the prevention of unauthorized access to and use of stored information,
  - (e) the control of dissemination of information contained in data banks,
  - (f) the effective application of sanctions for infringement of individual privacy,
  - (g) such related matters as may be thought relevant;
  
- urges the Commission, in the light of the special committee report, to give early attention to the preparation of a Directive designed to protect the individual Community citizen from abuses in the storing, processing and dissemination of personal information by means of automatic data banks in both the public and the private sectors.

Various legal problems have delayed the setting up of the special committee in the Parliament. However, on 8 April 1976 the Parliament adopted a resolution in which, anxious to step up its activities in this field, it invites the Commission to bring its preparatory work to a conclusion and instructs the Legal Affairs Committee to report to it on the matter.

Here too, an updated version of this study will be able to give more precise information.

In its document COM(75)467, the Commission proposed the launching of an extensive study on data security and confidentiality which would be carried out by computer research institutes in the Community and would cover the technical, legal, social and political aspects of the problem. Obviously a study of this kind would be a useful supplement to the work undertaken in this field by the European Parliament, government authorities and the Commission.

Finally, the Commission has started to collect from the Member States the information required for the study of this problem, and has decided to set up a study group of experts from the Parliament and the Member States and representatives from the Council of Europe and the OECD; the first meeting is to be held on 1 June 1976.

As far as possible account will be taken of the extensive work already done in these two international organizations \* .

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\* See for example the work of the Data Bank Panel of the OECD Computer Utilization Group (Science, Technology and Industry) on this subject, and the publications of the Council of Europe, most recently : Data protection in Europe - Comparative presentation of standards on the protection of the privacy of individuals vis-à-vis electronic data banks prepared by the Council of Europe and by the Member States - Strasbourg 1975.

CONCLUSION

It has been found that, although the study outlines the development of data-processing within the Community in relation to the world situation, this situation is still insufficiently known.

In the Community in particular, the data available is fragmentary and there are also substantial gaps at world level. Whether it concerns the existing world market for data processing and medium-term forecasts, its breakdown according to the different sub-sectors singled out or the situation of the industry and the use of data processing, the data varies according to source (often the press).

As for Community data proper, if it is to be significant and consolidated, its collection would have to be organized by a standing working party whose tasks would be :

- to define the data required to ensure effective supervision of Community projects under the multiannual programme, in terms of the data that can be collected in the Member States,
- to lay the foundations for the harmonization of the data at Community level so that it can be compared and consolidated,
- to organise the regular annual collection of such data so as to be able to supply an annual updating in conjunction with the report which the Council has requested the Commission to supply each year on the progress and effects of current projects,
- to check the validity of the consolidated data established by the Commission.

The Commission would have to initiate a number of studies to supplement the basic information available on certain aspects that are inadequately documented (such as consolidated data on the world market, the service industry or the production of integrated circuits).

Such activities would obviously have to be carried on in close cooperation with the SOEC whose task this is, if only because it has already studied the question of the balance between the maintenance of confidentiality and the need for information.

This is just one aspect of the coordination of data-processing policies in the Member States, the political bases for which will be defined elsewhere.

In any case a better knowledge of the sector with more complete, reliable and up-to-date information is of vital importance for users and for the industry. Precise statistics would be one means of making the market more transparent and improving conditions of competition.

In conclusion, the continuation of this work, calling for means far exceeding those provided so far, would make an indirect contribution towards attaining the aims of the Council Resolution of July 1974 on a Community policy on data processing.



A N N E X

Numerical and statistical data

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Preliminary note concerning conversion of national currencies into European Units of Account

For all the tables taken from studies or press articles and giving figures already converted, these have been retained; the conversion rates are not always given and, where they are given, do not necessarily tally with the figures published by the SOEC.

As regards Tables 6 (State aid), the single rate of exchange, used arbitrarily, is the 1975 EUA (Source : SOEC, General Statistics N° 12/1975). Thanks to this practice, generally accepted by economists, comparable orders of magnitude can be obtained, but the absolute figures are less reliable.

To bring out the discrepancies which may occur between amounts worked out and given in units of account depending on their origin, the table below gives, as examples, the SOEC conversion rates and those used in the SOBEMAP study \*/

Currency conversion table

(1 EUR = ....)	SOBEMAP study		SOEC conversion rates (1 EUA = .....)	
Currency	1973	1974	1974	1975
DM	3,3	3,2	3,03	3,05
Ffr	5,6	6,0	5,58	5,22
Lit	729	813	819,8	798
F1	3,5	3,4	3,15	3,13
Bfrs	48,7	48,7	45,41	46
£	0,5	0,5	0,535	0,576
Dkr	7,6	7,6	7,13	7,2
§	1,25	1,25	1,257	1,165
¥	339	363		354,3

\* Study of requirements for financing the european data-processing industry - SOBEMAP - May 1975 conducted for the Commission. Study, the unit of account user is the EUR.

53a

DATA-PROCESSING MARKET

1.1. World computer market in 1973 (Total expenditure by users)

	World	U.S.A.	West Europe	Japan	Rest of Western World	Eastern bloc
in bn \$	57.2	31.5	15.1	4.4	4.05	2.15
as %	100	55	26.4	7.7	7.1	3.8
1980 forecasts in bn \$	?	76.6	45.8	?	?	?

Source : Euroeconomics

Cited by Ol-Computer management - July-August 74

1.2. European computer market in 1973 (Total expenditure by users)

	Total	West Germany	France	United Kingdom	Italy	Others
in bn \$	15.1	4.18	3.40	3.07	1.26	3.21
as %	100	27.7	22.2	20.3	8.3	21.2

Source : see above

1.3. Breakdown of user expenditure in 1973

	Computer Industry	Internal expenditure (salaries, costs)	of which salaries	Other industries
U.S.A.	47.3 %	46 %	35.3 %	7.5 %
Europe	46 % (*)	40 à 46 %	?	8 à 14 %
Japan	55.2 %	41.5 %	29.2 %	4.4 %

\* of which 17 % on European industry

Sources : Euroeconomics and The USA data processing market and industry - Report by French Embassy in Washington

1.4. Structure of the Community market (expenditure on computers in 1974 and forecasts 1979)

		Total	Central Processors and systems *	Peripherals	Mini-Computers	Software
1974	in M AU	5,500	3,180	1,380	510	470
	%	100	57	25	9	9
1979	in M AU	10,100	5,208	2,831	1,108	994
	%	100	51	28	11	10

Source : Sobemap Study

1.5. Community market (expenditure on computers) by Member States in 1974 and forecasts for 1979.

	Total	West-Germany	France	United Kingdom	Italy	Benelux Denmark Ireland	
1974	in MAU	5,500	1,529	1,467	1,431	594	520
	%	100	28	26	26	11	9
1979	in MAU	10,100	2,806	2,907	2,410	1,084	934
	%	100	28	29	24	10	9

Source : SOBEMAP Study

1.6. Breakdown by sector in 1974

	Total	West Germany	France	U.K.	Italy	B, DK, Ir	% total
Central Processors and systems *	3,177	824	851	820	375	307	57
Peripherals	1,382	425	310	398	119	130	25
Mini + Micro computers	508	140	165	115	41	47	9
Software	474	140	141	98	59	36	9

Source : SOBEMAP Study

\* In the study under consideration, the term "system" means a complete installation, comprising a central processing unit and all the peripherals necessary for its use, sold as a package. The term "peripherals" means equipments sold separately, but capable of being adapted to or to complete an existing system.

The term "mini-computers" is equally intended to mean complete systems whose value is less than 42,000 U.A. The reference to software only includes professional work.

1.7. a) Development of total DP expenditure in different countries as a % of G.N.P.

	West Germany	France	Italy	United Kingdom	Benelux	United States
1970	1,34	1,18	0,77	1,55	1,15	2,11
1975	2,45	2,65	1,5	2,83	2,3	3,2
estimate 1980	4,6	4,4	3,0	4,75	4,2	5,5

Source : Euroeconomics

1.7. b) Gross national product at market prices (Mio EUR)

	1970	1974
West Germany	185.364	304.651
France	140.996	213.137
Italy	93.090	119.535
Netherland	31.764	55.748
Belgium	25.434	42.531
Luxemburg	1.065	1.702
United-Kingdom	122.333	153.421
Ireland	3.954	5.391
Danmark	15.529	24.242
EE.C. - 9	619.529	920.358
U.S.A.	987.862	1.128.000

Source : S.O.E.C.

Note :

The estimates in Table 1.7 a appear grossly overestimated. For example, user expenditure in the United States was recently estimated by IDC \* as follows :

	1973	1974	1975	1976
Outside expenditure	12.074	14.365	16.860	20.050
Internal expenditure (staff)	7.091	8.117	8.800	9.950
TOTAL	19.165	22.482	25.660	30.000

This gives the following figures for data processing expenditure in the United States as a % of the GNP :

	1973	1974	1975	1976
GNP (\$ '000 000 000)	1.289	1.397	1.500 ?	1.650 ?
Expenditure as % GNP	1,49	1,61	1,71	1,82

Source : French delegation

Since terminals are not included, the figures may be underestimated by about 4 % (for example, this would bring the percentage to 1.77 instead of 1.71 for 1975).

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\* Quoted by O1 HEBDO of 31 May 1976, p. 5

Likewise, taking the official value of the GNP (Table B) and the official 1974 exchange rate (1 EUR = \$ 1.25 ), the value obtained is higher than that given above (\$ 1,410 000 million), which further reduces the percentage to 1.59 % in 1974.

For France the French expert gave the following estimates for 1975 :

- Hardware expenditure	
- Annual computer rental costs :	Ffr. 4,300 m.
(installed in France at 1.1.1975 : 20,200 m	
at 1.1.1976 : 22,500 m	
COTTI estimates)	
- Computer purchases (20 % of 1975 deliveries)	Ffr. 1,100 m
- Other purchases, desk office computers	Ffr. 800 m
remote processing	Ffr. 800 m
data preparation	Ffr. 300 m
	<hr/>
Total :	Ffr. 7,300 m
	=====

Hardware expenditure (excluding use of service bureaux and consultants) represents 41.5 % of the total expenditure of public departments and undertakings, which amounts to 17,600 million.

The turnover of service bureaux and consultants in 1975 was about Ffr. 2 800 m. Total expenditure of users was therefore 20,400 million representing  $20.4 / 1450 = 1.4$  % of the GNP and not 2.65 % as given in Table 1.7 a.

Consequently this table must be considered as merely indicating a trend. To obtain reliable figures at Community level, the above exercise would have to be repeated for each Member State and supplemented by the value of the installed computers referred to the GNP; this statistic has been compiled by the American Department of State, but data is available only for 1972-1973 (see DAFSA report 1976 - op. cit. Table 1.5).



1.8. Forecast annual growth rate in turnover of the European DP industry from 74/79 (as %)\*

	Total Commun.	West Germany	France	United Kingdom	Italy	B,DK, Ir
Central Processors and systems	10,5	10	12	9	11	10
Micro computers	17	15	20	18	18	18
Peripherals	15,5	15	18	14	15	15
Software	16	20	15	10	15	15
TOTAL	13	13	15	11	13	11,5

\* At constant Prices

Source : SOBEMAP Study

1.9. Share of European companies in the Community market

	Computers & systems		Mini & micro computers		Peripheral		Software		Total	
	as MUC	as %	as MUC	as %	as MUC	as %	as MUC	as %	as MUC	as %
West										
Germany	247	30	84	60	170	40	63	45	564	37
France	179	21	82	50	124	40	86	61	471	32
United Kingdom	295	36	40	35	119	30	75	77	529	37
Italy	11	3	14	35	60	50	25	42	110	18
Benelux, Danemark, Ireland	71	23	21	50	39	30	23	60	154	30
Total 1974	803	25	241	48	512	37	272	57	1.828	34
Forecast 1979*	1.675	32	605	54	1.251	44	579	58	7.110	41

\* For France, the figures shown reflect the situation in 1974, that is before signature of the CII-HB agreements. Given that some of the assumption of the study cannot be realised, the 1979 forecast must be treated with reserve.

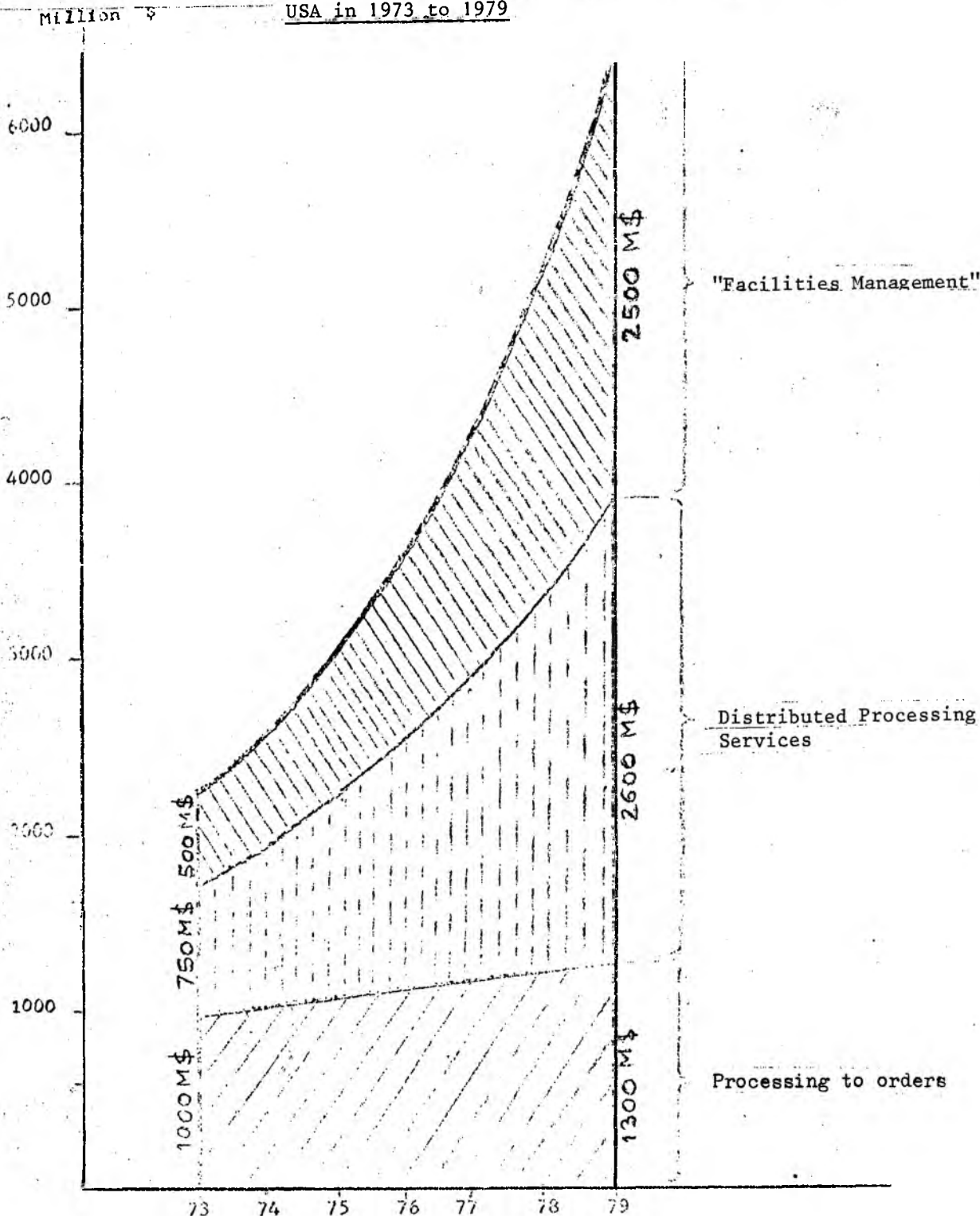
Source : SOBEMAP Study

1.10. Forecast development of the structure of the world DP market (as %)

		1973	1980	1985		
Peripherals	Medium + large computers	71.7 %	51.6 %	38.6 %	Central processors	
	Data gathering terminals	11 %	48.4 %	61.4 %	Office automation	
	Minis for industrial use	9.1 %				30.4 %
	Minis for scient.techn. use	6 %				
	Pointers	2.2 %				
		28.3 %	22.3 %	Distributed system		

Source : Italian delegation study

1.11 Market evolution of Data processing services in USA in 1973 to 1979



Source: The computer market and industry in the USA - Report by French Embassy in Washington.

1.12. Computer services market in the main Community countries in 1975  
Forecasts for 1980

millions \$	France	West Germany	United Kingdom	Italy	Netherland	Total
1975	621	578	379	165	131	1,874
1980	1,701	1,484	883	389	331	4,788

1.13. Revenue of European \* computer service bureaux in 1975  
and forecasts for 1980

	Data bases		Remote batch users		On-line		Total
	M \$	%	M \$	%	M \$	%	M \$
1975	62	15	237	57	117	28	410
1980	122	9	884	65	354	26	1,360

\* Including Switzerland, Spain, Portugal and Scandinavia.

1.14. Computer Services market in Europe in 1975 and forecast to 1980  
Broken down by type of service \*

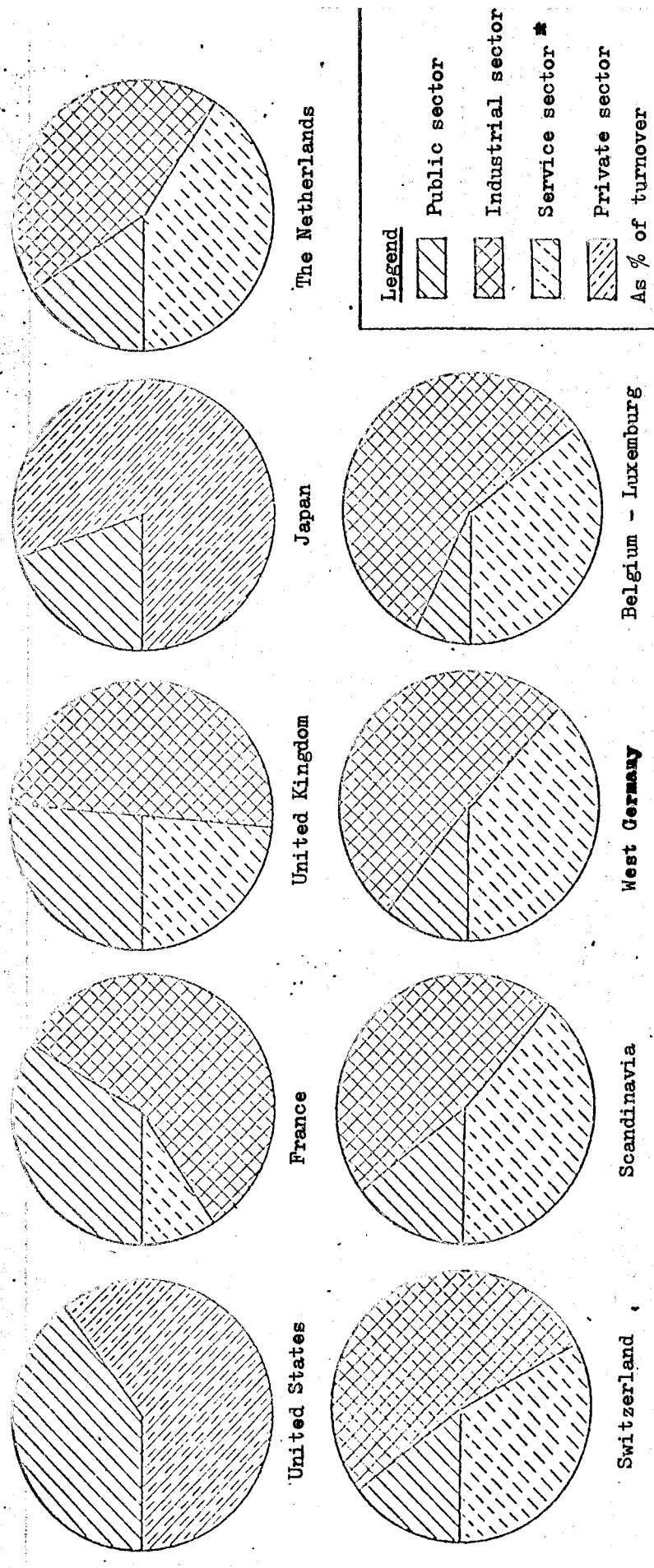
	Batch services		Software services		Software equipment		Networks		Total
	M \$	%	M \$	%	M \$	%	M \$	%	M \$
1975	1,066	42	697	27	343	15	410	16	2,608
1980	2,383	37	1,818	28	849	13	1,360	21	6,410

\* of which facilities management (part of Batch + network services)  
 64 M \$ in 1975, 802 M \$ in 1980

Common source : Quantum Sciences Maptek Europe  
 Study 1975  
 by kind permission of Quantum  
 Sciences.

1.15 The main customers of industry of computer service in 1974

Customer {  
 { Public sector { Central Government, local Administrations, State-owner enterprises  
 { Private sector { Industrial sector = Primary industries and process industries  
 { Service sector = Including, transport, Trade, Banks, Insurances



\* Private sector means services + industry where it is not possible to identify.  
 Source : CAP. SOGEM

1.16 Comparison of data-processing turn-over with those of other industrial sectors

\$ Thousand millions	United-States	Enlarged EEC	Japan
Data-processing (1973)	13,4	* 6,9 (1974)	2,25
Aerospace (1973)	27,7	5,8	0,4
Chemistry (1971)	52,0	44,0	16,5
Iron and steel (1971)	20,0	16-17	13-14

Source : "L'industrie de l'informatique dans le monde". DAFSA study 2nd quarter 1976.

\* note : differences between the sources are apparent; table 1.5 shows a Community market in 1974 of 5.5 Millions U.A.

1.17 Share of the added value of data-processing, of aerospace and of steel in the G.N.P. (gross national product)

1971 - 1972 - 1973	data-processing	Aerospace	Steel
VA/GNP Enlarged EEC	0,35 %	0,29 %	1,1 %
United-States	0,75 %	1,25 %	1,4 %

Source : "The data processing industry in the world" - DAFSA study 2nd quarter 1976.

64a

THE WORLD AND THE EUROPEAN COMPUTER PARK

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2.1 Division of the computer park in the world in general purpose computers of the principal manufacturers and by region

Manufacturer	World		West Europe		Easten Countries		USA		Japan	
	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA
IBM	56.60	48.76	54.40	13.79	2.90	3.05	68.76	24.75	35.50	4.49
Honeywell	8.19		10.22		1.89		8.96 (HIS)		1.02 (HIS)	
Univac	6.52		5.68		0.59		7.61		7.50	
Manufacturers of the COMECON	5.17		-		82.75		-		-	
Japan. product.	4.69		-		-		-		50.23	
Burroughs	4.64		3.28		-		5.74		3.22	
ICL	3.14		8.31		8.47		-		-	
Unidata	2.68		8.32		1.45		-		-	
NCR	2.41		2.03		0.38		2.87		1.83	
Others	5.96		7.26		1.57		6.06		0.70	

Source : Third data processing programme of the federal government 1976-1979



2.2 Division of the computer park in the world in general purpose computers of the principal manufacturers and by region.

Manufacturers	West Europe		West Germany		United Kingdom		France		Other European Countries	
	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA	Park share in %	Total value of systems at 1.1.75 in '000MUA
IBM	54.40	13.79	61.56	3.69	39.72	2.85	54.86	2.49	57.47	4.75
Siemens	-		17.56 (Unidata)		-		-		-	
ICL	8.31		1.07		31.14		2.97		2.92	
Unidata	8.82		-		-		9.91		6.36	
Honeywell	10.22		7.00		9.58		15.04		10.60	
Univac	5.68		5.29		4.80		3.97		7.42	
Burroughs	3.28		1.09		5.26		3.77		3.53	
NCR	2.03		0.98		2.89		1.29		2.73	
Others	7.26		5.45		6.61		8.19		8.97	

Source : Third data processing programme of the federal government 1976-1979

2.3. Breakdown of the installed park by cost category as at 1.1.1974

	Very small	small	medium	large	Value of park (x bn \$)	Number
Monthly Rental	<2.5	2.5 à 10	10 à 40	>40		
Selling price (x 1000 \$)	<115	115 à 450	450 à 1800	>1800		
As % of value :						
United States	10 %	14 %	43 %	33 %	27.3	
Outside U.S.A.	12 %	15 %	46 %	27 %	17.3	
As % of number :						
United States	47 %	24,5 %	23 %	5,5 %		62,245
Outside U.S.A.	43.5 %	33 %	20.5 %	3 %		44,541

Source : Hearings of the Committee on the judiciary United States Senate - Part. 7. The computer industry 1974.

2.4. - Computer Park by number in 1973

Size (1)	Very small	small	medium	large	Total
- World	51,252	133,462	26,604	5,132	216,450
- United States	28,250	76,000	11,200	1,500	116,950
- Common Market	9,667	24,674	6,552	1,420	42,313
- Japan (2)	4,290	10,023	4,419	1,357	20,089
- West					
- Germany	3,584	8,196	2,233	417	14,430
- France	2,112	6,505	1,169	273	10,059
- United Kingdom	1,978	4,461	1,244	310	7,993
- Italy	964	2,036	1,200	230	4,430 (3)
- Benelux, Denmark and Ireland	1,029	3,476	706	190	5,401

Source : EURODATA-SOBEMAP.

(1) The breakdown into size is as follows :

- "Very small" : total value \$ 22-44 thousand
- "Small" : total value \$ 44-470 thousand
- "Medium" : \$ 0.7 M - \$ 1.4 M
- "Large" : more than \$ 1.5 m

(2) These figures are based on a different classification.

(3) A lower figure than that, provided by the Italian delegation : 5100.

2.5. Evolution of the French computer park

For France, the latest estimates, based on a different classification are as follows :

Evolution of the French computer park (by number)

	Very small	Small	Medium	Large	Total
1/1/1974	2758	5596	1848	546	10748
1/1/1975	3924	6466	2038	624	13052
1/1/1976	6042	6676	2222	720	15660

Very small : value less than 250 KFF  
Small : 250 KFF V 1600 KFF  
Medium : 1600 KFF V 7000 KFF  
Large : V 7000 KFF

The previous figures do not include "office computers"

Evolution of the French "office computer" park

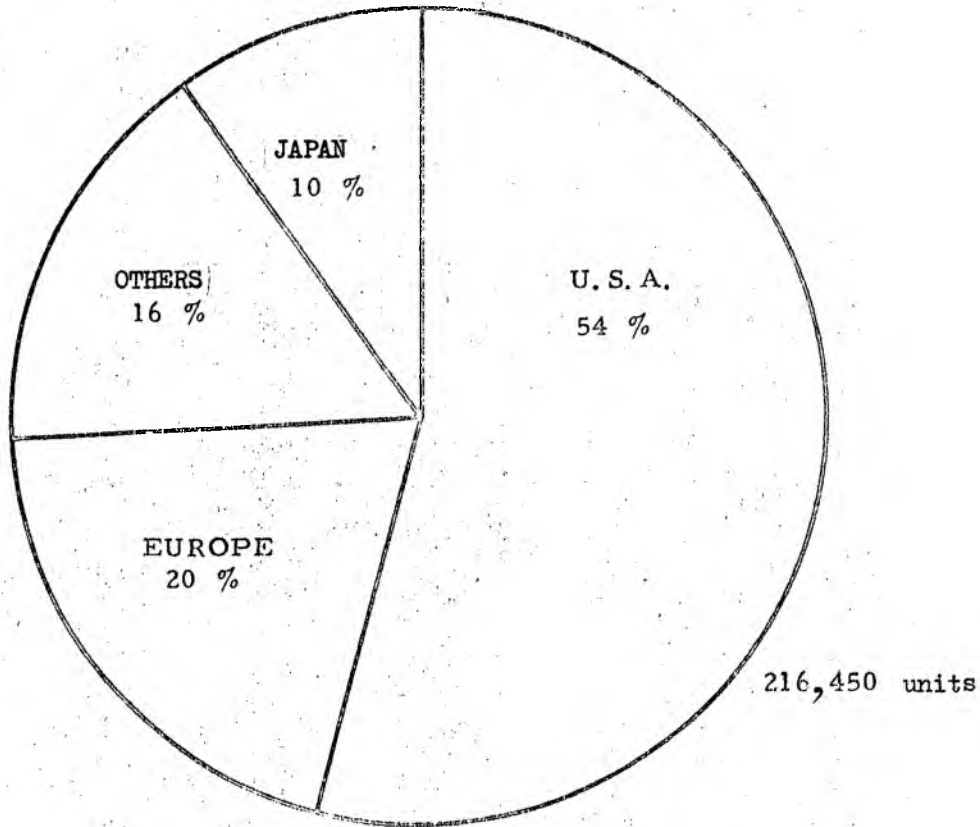
	Minis	Very small	Small	Total
1/1/1974	12283	15429	703	28415
1/1/1975	14608	17765	1007	33380

Minis : value less than 50 KFF  
Very small : 50 KFF V 250 KFF  
Small : V 250 KFF

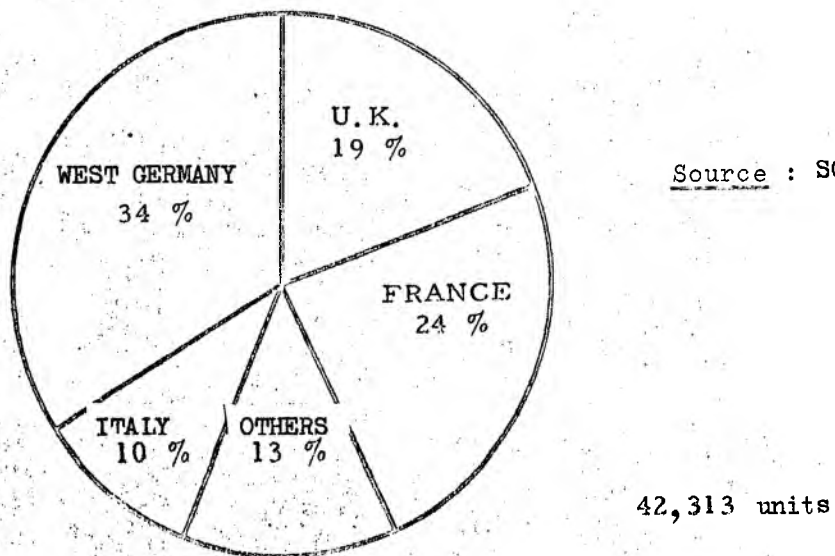
Source : French delegation

2.6 - Breakdown of the park by number in the world and in the Community in 1973

WORLD

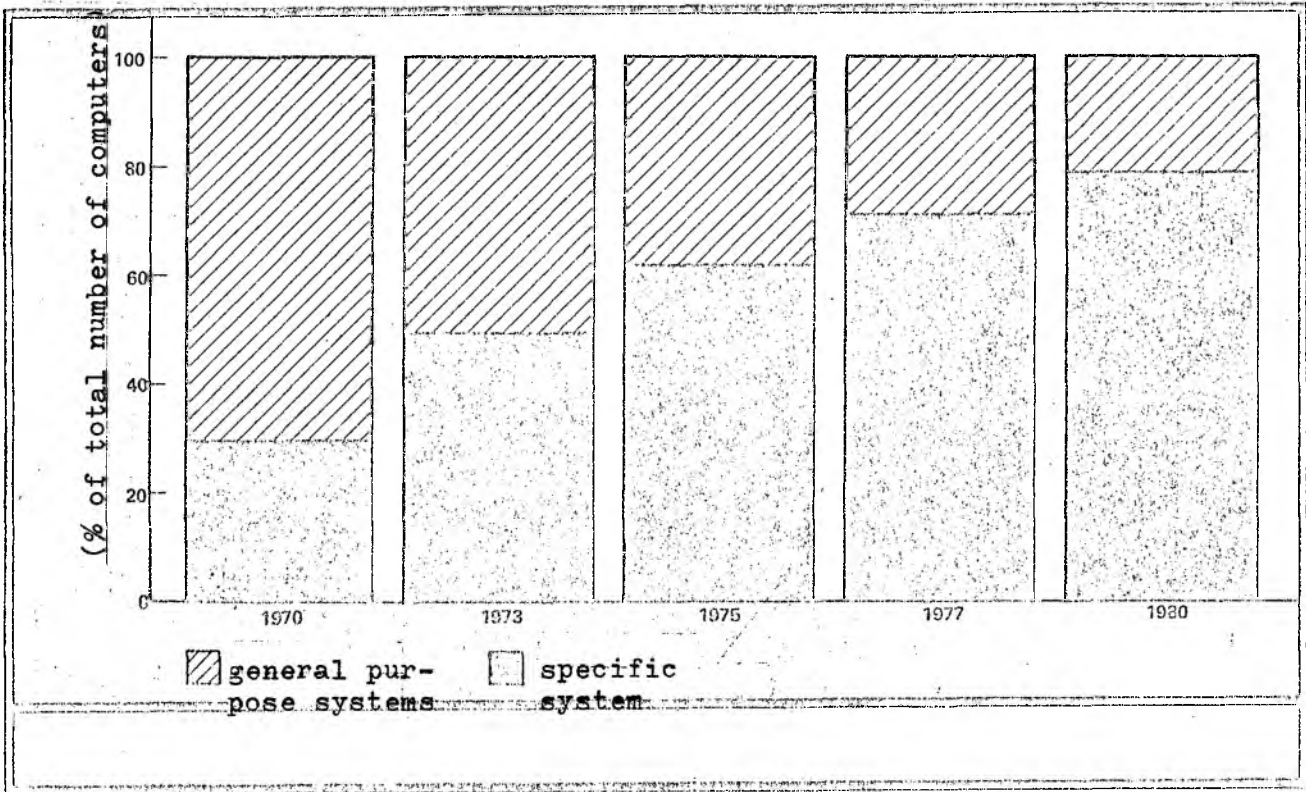


E.E.C.



Source : SOBEMAP Study

2.7. Relative trends in use of mini-computer-based and classical systems from present to 1980 (in %)



The number of systems based on mini computers will grow enormously in the next five years relative to classical systems. In 1980, mini-computer systems will represent 80 % of all systems.

Source : Electronics / October 16, 1975.

2.8 Main general purpose systems available on the market

a) U.S.A.

Size Class	IBM	Univac	Burroughs	MCR	GDC	HIS	Other
1	System/32			8200			
2	System/3-6 System/3-8 System/3-10	1004, 1005 9200	B-700 B-1712 B-1714	Century 50		G-5X H-61/XX H-62/40	Singer-10
3	370/115 S/3-15 360/20, 22, 25	9300 Spectra 70/15, 25 Spectra 1600	B-1718 B-1726 B-1728	C-100 C-101 C-151		H-105/115 H-2020 H-2030 H-62/60 H-64/29	XDS-530
4	370/125 370/135 360/30, 40	9400 Spectra 70/2, 3 90/30 Spectra 70/35	B-25/2700 B-35/3700	C-200 C-201 C-251	31/3150 3200	H-64/40 H-66/10 H-2040-60 H-1015/2015	DEC 1040/50 DEC 1055 XDS Sigma 6, 7, 8
5	370/145 360/50	9700 90/60, 70 Spectra 70/45, 46 70/55	B-45/4700 B-55/5700	C-300	33/34/3500 Cyber 72	H-2070 G-6025 G-6030/40 H-66/20, 40 H-3200/4200	DEC 1060/70/77 XDS Sigma 7
6	370/155-158 360/65	U 1100/20 1106/7 Spectra 70/60, 61 70/6, 7	B-65/6700		Cyber 73, 172, 173, 174, 62, 64, 6500, 36, 3800	H-2088 G-6050/60 G-6070/80 H-66/60	XDS Sigma 9
7	370/165-168 360/67, 75, 85, 9X 370/195	1108 1110 U 1100/40	B-7700		Cyber 175 66/6700 Cyber 74/76 Star 100	G-6180 H-66/80 H-68/80	Andahl 470/V6

Source : German delegation  
 IDC Deutschland Report, Volume 2  
 N° 6,5.2 - 1976

2.8. Main general purpose systems available on the market

b) Europe + Japan

Size class	CII	ICL	SIEMENS	Fujitsu Hitachi	Nec Toshiba	Mitsubishi OKI
1						
2		2903	404			
3	100 30	2904 1901/A/S/T	4004/15,16 /25,26 /220 7-720	V1	Acos 200	Cosmo 300
4	IRIS 45/50	1902/A/S/T 1903/A/S * S 4/30,40,50	4004/35/45,135 /230 7-730, 7-740	V2 V3	Acos 300 Acos 400	Cosmo 500
5	100 70 IRIS 60	1903T 1904/A/S * S 4/70,72,75	4004/46,55 /150,151 7-750, 7-755	M 160	Acos 500 Acos 600	Cosmo 700
6	IRIS 80	1906/A/S	TR 440	M 170	Acos 700	Cosmo 900
7				M 180 M 190		

Sources : - French delegation for Japan

- German delegation  
IDC Deutschland Report, Vol. 2,  
n° 8,5.2 - 1976 for Europe

\* S 4 = System 4 Modell 30, 40, 50  
70, 72, 75

2.9. BREAKDOWN OF THE USA PARK BY ECONOMIC SECTOR

(% of value)

S E C T O R	%
Food industry	2.3
Printing + publishing	2.3
Chemical industry	3.5
Metallurgical industry	2.1
Engineering industry	5.0
Electrical industry	5.6
Automobile, railways, aircraft and marine industry	6.2
Transport (operation)	4.1
Telecommunications	3.9
Energy	2.9
Wholesaling	4.6
Retailing	3.7
Banks and finance houses	11.0
Insurance	9.9
Services to industry (service bureaux)	14.9
Medical	2.0
Education	8.2
Federal and local Administration	6.5
Miscellaneous	1.3

The USA data processing market and industry  
Ref. : Report of the French Embassy in Washington



2.10 Public and private sector computer markets, in number and value (£ M)  
broken down by firms, in the United Kingdom end-1974

Manufacturers	Private Sector			Public Sector *			Total		
	number	Value £ mil- lion	% by value	Number	Value £ mil- lion	% by value	Number	Value £ mil- lion	% by value
<u>NATIONAL</u> <u>Manufacturers</u>									
ICL	992	184.3	23.7	658	195.2	46.3	1650	379.5	31.7
GEC	123	4.8	0.6	391	18.5	4.4	514	23.3	1.9
FERRANTI	83	5.1	0.7	241	15.4	3.7	324	20.5	1.7
COMPUTER TECHNOLOGY	37	0.6	<0.1	160	3.3	0.8	197	3.9	0.3
PLESSEY	2	0.1	<0.1	7	1.4	0.3	9	1.5	0.1
DIGICO	37	0.2	<0.1	81	0.5	0.1	118	0.7	<0.1
OTHERS	81	2.2	0.3	40	1.7	0.4	121	3.9	0.3
TOTAL	1355	197.3	26.4	1578	236.3		2933	433.	36.1
<u>FOREIGN</u> <u>Manufacturers</u>									
IBM	1188	352.5	45.4	288	100.0	23.7	1477	452.5	37.7
HONEYWELL	496	56.1	7.2	207	18.2	4.3	703	74.3	6.2
BURROUGHS	3362	56.9	7.3	115	8.4	2.0	3477	65.3	5.5
UNIVAC	140	35.5	4.6	50	14.9	3.5	190	50.4	4.2
CDC	11	4.0	0.5	18	14.0	3.3	29	18.0	1.5
NCR	566	26.6	3.4	96	4.6	1.1	662	31.2	2.6
DEC	449	7.7	1.0	558	8.1	1.9	1007	15.8	1.3
XEROX DATA	32	11.0	1.4	17	3.3	0.8	49	14.3	1.2
PHILIPS	719	8.8	1.1	61	0.6	0.1	780	9.4	0.8
OTHERS	1018	20.8	2.7	818	13.7	3.2	1836	34.5	2.9
TOTAL	7981	579.9	74.5	2229	185.8	44.0	10210	765.7	63.9
<u>TOTAL GENERAL</u>	9336	777	100	3807	421.8	100	13143	1199.0	100

\* Central Government, local Government and Public Corporations (further breakdown in table 6.12)  
 The estimates by value are based on the **weighted average installation costs**.

SOURCE : U.K. delegation

2.11 The computer park in Denmark

a) Breakdown by sector and by company by number and value in 1970  
in million Kr)

Manufacturers	PUBLIC			PRIVATE			OTHERS			TOTAL		
	number	val.	% val.	number	val.	% val.	number	val.	% val.	number	val.	% val.
<u>EUROPEAN Manufact.</u>												
SIEMENS	3	6	2	16	28	3	-	-	-	18	75	6
REGNECENTRALEN	12	17	5	15	29	3	1	1	1	28	47	3
ICL	1	1	<1	25	43	5	1	1	1	27	45	3
PHILIPS	1	1	<1	15	2	<1	12	1	1	28	4	<1
<u>FOREIGN Manufact.</u>												
IBM	41	284	85	131	569	65	13	41	25	185	894	65
UNIVAC	3	3	1	14	28	3	6	103	62	23	134	10
BGE	1	6	2	31	46	5	2	4	2	34	50	4
CDC	1	11	3	4	22	3	1	12	7	6	45	3
NCR	-	-	-	17	46	24	1	1	1	18	41	3
BURROUGHS	2	9	3	9	18	2	2	3	2	13	30	2
OTHERS	5	2	1	4	7	1	-	-	-	9	9	1
TOTAL	70	334	100	280	877	100	39	167	100	389	1378	100

Remarks : The source is a study in 1970 by the statistical institute in Denmark.

In the private sector all industries including public ly -owned industries are included.

Equipment in Universities and Research Institutes are under the column "others".

b) Breakdown by sectors and types of equipment, by number and value in 1973 (in million of Kr)

	Central processing units A Value	Peripherals B Value	Installations (A + B)		Data-transmission Equipment (value)	Total (by value)
			Number	Value		
Commerce	126.6	88.2	91	210.9	6.7	217.5
Industry	142.8	115.5	126	257.8	8.1	266.4
Services	250.3	196.5	81	447.0	12.7	459.6
Banks	102.5	94.1	22	196.7	7.9	204.5
Insurance	41.0	42.8	16	83.9	-	83.8
Public sector	385.0	263.4	69	621.3	19.9	641.3
Others	63.5	70.6	20	134.2	2.5	136.6
Total	1 107.7	844.1	425	1.951.8	57.8	2.009.6

Notes : - Breakdown by manufacturers in 1973 is not supplied.

- The total number of installations includes only those installations whose central processing unit value is greater than 250,000 Kr and whose capacity is greater than 1000 bytes are taken into account. One installation is made up of 1 to 3 central processing units and their peripherals.

Source : Report of the Danish delegation

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TURNOVER OF THE INDUSTRY

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3.1. Financial data on the world wide data-processing industry (central processors)

1974	Total turnover	Equiv. in million UA**	Depreciation	self-financing	Final resources	Capital	total expenses	R - D	Equiv. in million U.A.**	Employees (by 1000)
<b>UNITED STATES (M \$)</b>										
IBM	12,675	10,879	1,575	2,726	2,979	2,913	7,937	890	764	292.0
Honeywell	2,636	2,254	271	360	390	340	2,180	170	146	95.3
Sperry Rand *	3,040	2,609	149	270	391	138	2,730	160	137	93.0
NCR	1,980	1,700	145	215	283	240	1,771	74	64	81.0
Burroughs	1,530	1,313	150	275	190	290	1,100	85	73	51.6
CDC	1,101	945	108	147	176	126	984	55	47	45.3
Dig.Eq. Corp.	534	458	17	65	151	46	459	48	41	19.0
Hewlett-Packard	893	767	31	117	152	86	740	71	61	28.9
<b>EUROPE</b>										
<b>France (MFF)</b>										
IBM-France	6,274	1,202	6,650	1,060	1,572	463	4,893	156	30	15.7
Honeywell-Bull	2,370	454	380	461	708	235	1,785	95	18	21.5
C.I.I.	1,361	261	120	110	212		1,574			8.6
<b>United Kingdom (M £)</b>										
IBM-UK	345	599	32	51	52	60	252	18	31	13.2
ICL	201	349	15	34	61	40	159			29.2
<b>RFA (MDM)</b>										
IBM-D	4,828	1,583	859	1,145	1,145	1,022	3,420			24.8
NIXDORF	444	146	16	38	85	27	413			8.0
<b>Netherlands (Mfl)</b>										
IBM-NL	812	259	101	165	165	95	524			5.9
Italy (109 Lit)	330	413	71	122	122		228			8.5
<b>JAPAN (105 Yen)</b>										
NEC	450	1,270	24	27	52	58	400	19	54	60.1
Fujitsu	250	706	15	26	40		199			31.3
OKI	117	330	5	8	16		104			16.0
Nippon-Univac	71	200	5	7	10		58			3.9

\* Univac is a department of Sperry Rand

\*\* See rate of conversion of SOEC - 1975 - p. 1

Source : Company reports - EEC inquiry - DAFSA study

3.2. World-wide sales of the computer industry (central processors)  
(not subsidiary companies)

1974	Total turnover in million \$	of which d.p. %	of which d.p. turnover	Direct sales %	Rentals and services %	Sales USA %	Sales EUROPE %	Sales %	Public sector or- ders %	R D (million \$)
<u>UNITED STATES</u>										
IBM (consolidated)	12,675	78	9,887	33.8	66.2	53	34 *	5 *	17	890
Honeywell (" )	2,626	47	1,234	73.4	26.6	61.5 *	31 *	1.5 *		170
NCR	1,980	34	673	65.3	34.7	49	25 *	9 *		160
Burroughs	1,530	67	1,025	62.7	37.3	64	18 *	4 *	7	74
Sperry-Rand	3,040	46	1,398	76.6	23.4	57	30 *	8		85
CDC	1,101	100	1,101	50	50	67	33		19	55
Dig.Equip.Corp.	534	100 (?)	534 (?)	81	19	61	25			48
Hewlett-Packard	893	37 (?)	330 (?)	99.4	0.6	52	32	62	15	71
<u>EUROPE</u>										
Siemens (D)	6,625	6	397.5			15	60			
Philips (NL)	9,725	2.1	204				69			
C.I.I. (F)	310	100	310				83			21
I.C.L. (RU)	345	100	345			1	80		53	36
<u>JAPON</u>										
Fujitsu	910	72	655	80	20			92		67.5
NEC	1,635	17	278					74	32	34 *
OKI	425	36	153					91		

\* 1972

Sources : Company reports  
DAFSA study.

3.3. Turnover and net profits of the main U.S. manufacturers

X \$ bn.	IBM				HIS, Univac, Burroughs, CDC, NCR together			
	1972-1974		1974		1972-1974		1974	
	\$	%	\$	%	\$	%	\$	%
World turnover	33.2	100	12.7	100	26.9	100	10.3	100
Turnover outside USA	15.2	45.9	5.95	47.7	10.85	40.3	4.25	41.5
Net world profits	4.7	100	1.8	100	1.8	100	0.7	100
Net profits outside USA	2.45	50.3	0.9	48	0.8	44.6	0.3	42.5

Sources : Company reports.

3.4 Trends in the turnover of American data-processing system manufacturers and their respective market shares.  
(Turnover in \$ X million)

		IBM	HONEY- WELL	G.E.	UNIVAC	RCA	CDC	BURROUGHS	NCR	OTHER AMERI- CATNS	TOTAL
1969	Turnover % Market	5686 67.1	351 4.1	412 4.9	526 6.2	239 2.8	571 6.7	317 3.7	134 1.6	238 2.9	8474
1970	Turn- over %	+ 4.3	+20.5	+5.8	+ 9.1	+ 5.4	- 5.4	+28.0	+43.8	-5.5	+5.9
	Turnover % Market	5928 66.0	423 4.7	436 4.9	574 6.4	252 2.8	540 6.0	406 4.5	192 2.1	225 2.5	8976
1971	Turn- over %	+10.3	+10.6	↓	+6.3	-20.6	+5.9	+9.8	+11.5	+0.8	+8.7
	Turnover % Market	6537 67.0	950 9.7	←	610 6.3	200 2.0	571 5.9	446 4.6	214 2.2	227 2.4	9755
1972	Turn- over %	+15.2	+11.7		+11.8	-32.5	+17.5	+27.5	+17.3		+15.0
	Turnover % market	7531 67.1	1061 9.5		682 6.1	135 1.2	671 6.0	569 5.1	251 2.2	339 2.8	11216
1973	Turn- over %	+15.3	+10.9		+13.6	↓	+39.4	+25.9	+17.5		+17.5
	Turnover % market	8684 65.9	1177 8.9		928 7.0	←	936 7.1	716 5.4	295 2.2	410 3.4	13183

Source: The USA data-processing market and industry - Report by the French Embassy in Washington



3.5. Turnover and employees of the main IBM subsidiaries within the Community in 1974.

	Turnover x \$ m	Increase in turn- over over 1973	Employees x 1000	Net pro- fits as % of turn- over	Percentage turnover remaining in the country concerned	Percentage turnover exported
IBM-Germany	1,855	+ 11 %	24.8	8.4	67	33
France	1,395	+ 17 %	15.7	5.5	63	37
U.K.	790	+ 25 %	13.2	6.7	53	47
Netherland	310	+ 30 %	5.9	11.3	63	37
Italy	470	+ 29 %	8.5	6.5	72	28
Belgium	?		2.41			
Irland	?		0.28			
Denmark	?		1.33			
Europe			1.06			

Sources : Commission enquiry.  
Company reports.

Definition of the indicators used in Tables 3.6 and 3.7

The uniform presentation of company accounts in Europe is the work of a special committee of the European Federation of Financial Analysts Societies \*. The indicators adopted are as follows :

A. Cost indicators

Ratio : intermediate consumption + payroll costs/production value.  
The lower the ratio, the better the position of the company on the market.

B. Economic and social indicators (management)

1. Value added/payroll costs : amount of value added per wage unit (productivity and profitability indicator)
2. Value added per person employed (pure productivity indicator)
3. Payroll costs per person employed (standard for comparison of wage levels)
4. Turnover per person employed : additional control indicator when approximations enter into the first ratios.

C. Growth indicators

1. Fixed utilizations (tangible capital assets + other investments/ value added): describes the investment effort during a given period by reference to the value added which expresses the company's real activity
2. Fixed utilizations/turnover (when the gross value added is not known)
3. Fixed utilizations/labour force : resolves ambiguity in the case of mediocre value added combined with a modest investment effort.

D. Financing indicators ("resources" aspect)

1. Current self-financing/value added : proportion of funds generated by the company put into reserve for the financing of utilizations. To be compared with ratio C.1.

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\* Mode de présentation des comptes satisfaisant pour l'analyse financière, FEAAF, Paris 1967.

2. Current self-financing/labour force : to be compared with ratio C.2. These two ratios are related to the growth indicators. The higher C.1 and D.2, the better the foreseeable growth and the financing structure of the company. These ratios are only really significant if they are cumulated over several years.
3. Current self-financing/fixed utilizations : indicates the coverage of investment expenditure by self-generated resources. Only meaningful in relation with the other C and D indicators.
4. Self-financing/turnover : additional ratio if gross value added is difficult to evaluate.

E. R & D indicators

Special ratios prepared for the DAFSA study.

1. R & D/production value (failing turnover)
2. R & D per person employed

Only the American companies provide these data in consolidated form.

3.6. Financial/economic performance ratios for a cross-section of data processing companies.

1974	UNITED STATES				JAPAN			
RATIOS	IBM	HIS	Burroughs	CDC	NEC	Fujitsu	OKI	Nippon Univac
<u>COSTS + EXPENSES</u>								
<u>expenses</u> <u>production</u> %	62.6	82.9	71.9	99.4	88.9	79.5	88.9	73.9
<u>MANAGEMENT</u>								
<u>Value added</u> <u>wages + salaries</u> \$	~ 2.31	~ 1.40	~ 1.68	~ 1.21	1.51	1.79	1.59	2.91
<u>Value added</u> <u>nos. employed</u> \$	~ 28,600	~ 17,000	~ 20,500	~ 14,700	9,010	13,590	7,930	24,330
<u>wages + salaries</u> <u>employees</u> \$	-	-	-	-	5,970	7,550	4,990	~ 8,300
<u>Turnover</u> <u>employees</u> \$	43,410	27,600	29,650	24,310	27,220	29,065	26,500	61,270
<u>GROWTH</u>								
<u>Fixed assets</u> <u>Value added</u> %					42.3	28.4	24.3	60
<u>Fixed assets</u> <u>Turnover</u> %	19.4	13.3	19.6	16.0	14.0	13.2	7.3	24.2
<u>Fixed assets</u> <u>Employee</u> \$	8,400	3,670	5,815	3,870	3,810	3,840	1,930	14,830
<u>FINANCE</u>								
<u>Self-financing</u> <u>Value added</u> %					18.2	22.4	23.6	40.7
<u>Self-financing</u> <u>Turnover</u> %	21.5	13.7	18.0	13.4	6.0	10.45	7.1	16.1
<u>Self-financing</u> <u>Employees</u> \$	9,340	3,780	5,330	3,245	1,640	3,030	1,870	9,295
<u>Self-financing</u> <u>Fixed assets</u> %	110.8	102.9	91.7	83.8	43.0	70.0	97.2	66.7
<u>RD</u>								
<u>R+D</u> <u>Turnover</u> %	7.0	6.5	5.55	5.0	3	7.4		
<u>R+D</u> <u>Employees</u> \$	3,050	1,780	1,650	1,210	607	2,153		

Source : DAFSA study 1976

3.7. Financial/economic performance ratios for a cross-section of data processing companies

1974 RATIOS	EUROPE				IBM subsidiaries *	
	Honeywell-Bull	CII	ICL	Nixdorf	Most favourable	Least-favourable
<u>COSTS + EXPENSES</u>						
<u>expenses</u> <u>production</u> %	75.3	93.5	79.6	87.0	64.5 (IBM-NL)	76.2 (IBM-I)
<u>MANAGEMENT</u>						
<u>Value added</u> \$	1.88	1.2	1.56	1.36	2.82 (IBM-UK)	1.95 (IBM-I)
<u>Wages + salaries</u> <u>Value added</u> <u>nos. employed</u> \$	17,340	17,210	7,865	11,270	47,220 (IBM-D)	21,775 (IBM-I)
<u>wages+salaries</u> <u>employees</u> \$	9,440	14,365	5,055	8,270	22,270 (IBM-D)	15,070 (IBM-I)
<u>Turnover</u> <u>employees</u> \$	33,545	35,165	13,730	21,480	74,870 (IBM-D)	52,260 (IBM-UK)
<u>GROWTH</u>						
<u>Fixed assets</u> <u>employees</u> %	38.7	42.0	44.0	30.5	63.6 (IBM-I)	33.2 (IBM-UK)
<u>Fixed assets</u> <u>Turnover</u> %	20.4	18.9	25.2	14.9	31.0 (IBM-I)	14.0 (IBM-UK)
<u>Fixed assets</u> <u>Employees</u> \$	6,850	7,235	3,460	3,435	18,760 (IBM-D et I)	7,290 (IBM-UK)
<u>FINANCE</u>						
<u>Self-financing</u> <u>Value added</u> %	36.8	16.5	29.3	16.3	66.3 (IBM-F)	25.4 (IBM-UK)
<u>Self-financing</u> <u>Turnover</u> %	19.5	16.5	16.8	8.0	32.3 (IBM-I)	14.8 (IBM-UK)
<u>Self-financing</u> <u>Employees</u> \$	6,525	2,840	2,300	1,840	17,760 (IBM-D et I)	7,710 (IBM-UK)
<u>Self-financing</u> <u>Fixed assets</u> %	95.2	39.3	66.5	53.5	113.0 (IBM-D et NL)	85.3 (IBM-F)
<u>RD</u>						
<u>R+D</u> <u>Turnover</u> %	6.6	5.6	9.0			
<u>R+D</u> <u>Employees</u> \$	2,210	2,455	1,230			

(\* Those subsidiaries included in the cross-section are the following : IBM-F, IBM-D, IBM-UK, IBM-NL, IBM-I.

Source : DAFSA Study - 1976

3.8 Market share of the main software companies in U.S.A. in 1973 -  
Turnover in million \$

	(Million \$)	%
CONTROL DATA	150	6,7
ELECTRONIC DATA SYSTEMS	100	4,4
GENERAL ELECTRIC	85	3,8
AUTOMATIC DATA PROCESSING	85	3,8
WYLY (UNIVERSITY COMPUTING)	45	2,0
BRADFORD COMPUTER & SYSTEMS	45	2,0
BUNKER--RAMO	45	2,0
NCR	35	1,5
STATISTICAL TABULATING	30	1,3
McDONNELL DOUGLAS AUTOMATION	30	1,3
COMPUTER SCIENCES	26	1,2
NATIONAL DATA	26	1,2
TYMSHARE	24	1,1
NATIONAL CSS	24	1,1

Source : The USA data processing market industry - Report by the French Embassy in Washington

Note : In the study, the service industry is defined as follows :

- service bureau batch processing
- distributed data processing services
- facilities management
- hardware maintenance

The study considers the industry for software and data processing studies separately. However, the software sector is defined on the basis of specific expenditure by users on work from outside sources. Consequently it represents only a small proportion (about 10 %) of all program writing, the costs of which are divided into users' own activities and software activities in the service industry as defined above, the percentage of which cannot be determined.

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PERIPHERALS AND MINICOMPUTERS

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4.1. 1973 estimates of world turnover and forecast \*

U.A. x bn 1973	U.A. x bn 1975	U.A. x bn 1980
5.36	17.24	22.99

\* captive markets excluded

Source : French delegation.

4.2. Geographical spread of turnover in 1973 and forecasts for 1978  
as a percentage of world market

	Europe	U.S.A.	Japan
1973	21 %	58 %	8 %
Forecasts 1978	25 %	49 %	11 %

Source : French delegation



Note : In tables 4.3 to 4.8 which follow the following interpretations have been used :

Market            Sales value of the equipment delivered in 1974

Production : Sales value of the equipment produced in 1974 by companies of which at least 50% of the capital is held by Europeans : the nationality of this capital defines the country of production.

For example all PHILIPS production in this sector is attributed to Holland.

Exports :        Sales value of equipment produced by European companies and delivered either to EEC countries or to the rest of the world.

Imports :        Sales value of equipment produced by European industries (EEC) or by non-Europeans (other) and delivered to European countries.

The market shortfall is calculated from the following formula :

$$t = \frac{i}{M} \times 100$$

where :

i = imports from non-European industries,

M = total market.

4.3. The European market for local computer peripherals in 1974  
(disks, drums, magnetic tapes, fast printers, etc..)

Unit : Million UA

	MARKET	PRODUCTION	EXPORTS		IMPORTS		Non CEE % of market
			EEC	Others	EEC	Others	
West Germany	280	52	4	5.5	4.5	233	83
United Kingdom	130	30	1.5	1	0.5	102	78
France	215	38	3	3	4	179	83
Italy	80	10	0.5	1	0.5	71	89
Benelux	60	10	2	2	1.5	52.5	88
Ireland							
Denmark							
TOTAL	765	140	11	12.5	11	637.5	83

Source : European "péri-informatique" industry -  
Report SEMA 1976

4.4. The European market for general purpose terminals in 1974  
(visual display, teleprinters, heavy terminals).

Unit : Million UA

	MARKET	PRODUCTION	EXPORTS		IMPORTS		Non CEE % of market
			EEC	Others	EEC	Others	
West Germany	48	28	6	4	3	27	56
United Kingdom	50	22	2	5	2	33	66
France	40	23.5	4	3	3	20.5	51
Italy	24	15	2	2	2	11	46
Benelux	13	3	-	-	4	6	46
Ireland							
Denmark							
TOTAL	175	91.5	14	14	14	97.5	55.7

Source : European "péri-informatique" industry -  
Report SEMA 1976

4.5 The European market for specialised terminals in 1974

(Banks, point-of-sale, factory, ...)

Unit : Million UA

	MARKET	PRODUCTION	EXPORTS		IMPORTS		Non EEC % of market
			EEC	Others	EEC	Others	
West Germany	35	28.5	2.5	2	1.7	9.3	27
United Kingdom	25	15	-	1	1	10	40
France	28	17.2	1.2	1	3	10	36
Italy	15	13	2	3	1.5	5.5	37
Benelux Ireland Denmark	10	8	2	1.8	0.5	5.3	53
TOTAL	113	81.7	7.7	8.8	7.7	40.1	35

Source : European "péri-informatique" industry -  
Report SEMA 1976

4.6. The European market of Equipments and data acquisition systems  
in 1974 (Centralised or decentralised, off-line or on-line,  
single or multikeyboard)

Unit : Million UA

	MARKET	PRODUCTION	EXPORTS		IMPORTS		Non EEC % of market
			EEC	Others	EEC	Others	
West Germany	34.4	9	2	1	5.5	22.9	67
United Kingdom	44.4	18	5	2	2.2	31.2	70
France	41	10.2	0.5	-	0.8	30.5	74
Italy	10.5	3	0.2	0.1	0.5	7.3	70
Benelux Ireland Denmark	10.7	8	1.7	2.2	0.4	6.2	60
TOTAL	141	48.2	9.4	5.3	9.4	98.1	70

Source : European "péri-informatique" industry -  
Report SEMA 1976

- 4.7 The European market for mini-computers for industrial and scientific use in 1974 (purchase price up to about \$ 40.000).  
 General purpose mini-computers, for example : MITRA 15 (CII), SELENIA GP 16, DEC PDP 8 and 11, CTL Modular 1, FERRANTI ARGUS.

Unit : Million UA

	MARKET	PRODUCTION	EXPORTS		IMPORTS		Non EEC % of market
			EEC	Others	EEC	Others	
West Germany	19.3	10.8	1.3	2.2	0.8	10.6	55
United Kingdom	18.5	8.7	0.5	0.7	1	10	57
France	15	10	2	1	0.5	7.5	50
Italy	6.8	1.8	0.1	0.1	1.2	4	59
Benelux							
Ireland	9.7	3.9	1	0.8	1.4	6.2	64
Denmark							
TOTAL	69.5	35.2	4.9	4.8	4.9	38.3	55

Source : European "péri-informatique" industry - Report SEMA 1976

- 4.8 The European market for small business systems in 1974.  
 for example systems sold by LOGABAX, OLIVETTI, NIXDORF, PHILIPS, IBM (systems 3; then system 32), NCR.

Unit : Million UA

	MARKET	PRODUCTION	EXPORTS		IMPORTS		Non EEC % of market
			EEC	Others	EEC	Others	
West Germany	144	174	33	34	23	14	9
United Kingdom	70	50	8	7	10	22	31
France	105	30	4	3	32	50	48
Italy	45	34	12	10	6	27	60
Benelux							
Ireland	50	50	20	8	6	20	40
Denmark							
TOTAL	414	338	77	62	77	133	32

Source : European "péri-informatique" industry - Report SEMA 1976

4.9. Summary table of the situation of  
computer peripherals in 1974 (in common market)

YEAR : 1974 UNIT : M.U.A. (1)	TOTAL MARKET (A)	SALES BY NON EEC OWNED COMPANIES (B)	SALES BY EEC OWNED COMPANIES		INTERNAL EXCHANGES OF EEC OWNED COMPANIES (E)	NON EEC % OF MARKET (F)
			IN EEC (C)	OUTSIDE EEC (D)		
Near in peripher.	765	637.5	127.5	12.5	11	83
General purpose term.	175	97.5	77.5	14	14	56
Specialised terminals	113	40.1	72.9	8.8	7.7	35
Data collection sy.	141	98.1	42.9	5.3	9.4	70
Mini-computers (2) R.T.	69.5	38.3	30.4	4.8	4.9	55
Mini-computers (3) N.R.T.	414	133	276	62	77	32
TOTAL	1677.5	1044.5	627.2	107.4	124.5	62
			734.6			

Where :

- (A) : Value of equipments delivered during 1974 in EEC Member States.  
 (C) + (D): Value of equipment produced during 1974 by companies owned at least at 50 % by Europeans (CEE) including those produced under licence.  
 (D) : Value of equipments exported from CEE  
 (B) : Value of equipments bought in CEE from non European companies, including those manufactured in Europe by non European (< 50 %) companies.  
 Internal CEE Exchanges : Value of equipment exchanges between CEE Member States (products of European-based companies).

(F) =  $\frac{(B)}{(A)} \times 100$  : Index of overseas dominance on the European market.

- (1) Million Units of Account  
 (2) Real Time applications : Value of the Mini-computer not including software  
 (3) Non Real Time (commercial business applications) : value of the whole system configuration not including software.

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ELECTRONIC COMPONENTS

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5.1. World components market  
(in MUA)

	1972	1973	1974
World (without communist countries)	14,600	17,100	20,000
USA	6,000	6,500	7,600
CEC (enlarged)	3,200	4,000	5,100
Japan	2,900	3,600	4,500
others countries	2,500	3,000	3,400

Source : EECA : GATT negotiation

5.2 World components market (in MUA)

a) active components

	1972	1973	1974
World	6,300	7,500	9,700
USA	2,800	3,100	3,700
CEC (enlarged)	1,400	1,800	2,500
Japan	1,300	1,600	2,300
others countries	800	1,000	1,200

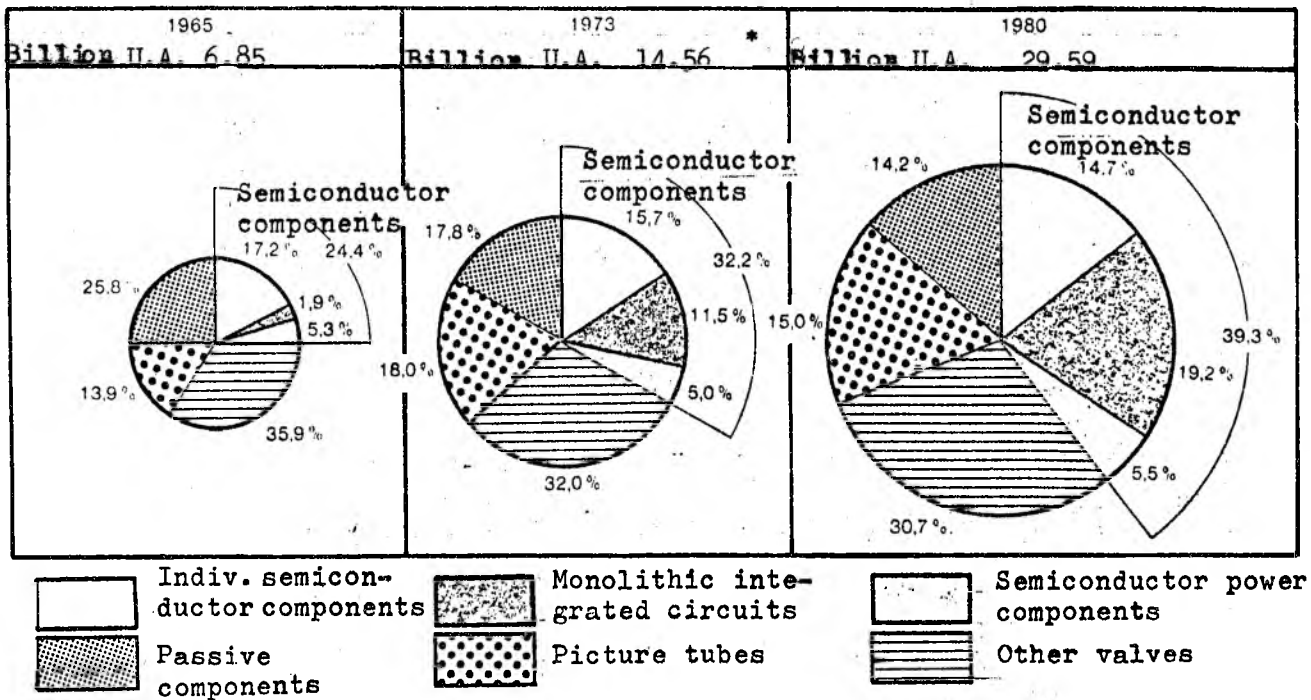
Source : EECA : GATT negotiation

b) passive components

	1972	1973	1974
World	8,300	9,600	10,900
USA	3,200	3,400	3,900
CEC (enlarged)	1,800	2,200	2,600
Japan	1,600	2,000	2,200
others countries	1,700	2,000	2,200

Source : EECA : GATT negotiation

5.3 Development of the world market for electronic components by product fields.



\* under-estimated value in relation to the data of table 5.1 (Billion U.A. 17.1)

Source: Electronic Components Programme of the Federal Republic of Germany 1974-1978



5.4 The world market for integrated circuits

a) World market of semi-conductors (in M \$)

	Integrated circuits	discrete components	Total
1975	1928	2000	4028
1976	2536	2450	4986
1977	3150	2800	5950
1978	3685	3300	6985

Source : WEMA (Western Equipment Manufacturer Association :  
Electronics 27/5/76 p. 35)

b) Breakdown of the use of integrated circuits (1975)

Data processing	46 %
General	19 %
Telecommunications	19 %
Other	16 %

This breakdown is not expected to change by more than a few percent up to 1980.

Source: French delegation

c) Geographical breakdown of the integrated circuit market

	1974	1980
United States	48 %	42 %
Europe	23 %	26 %
Japan and associated countries	25 %	26 %
Other	4 %	6 %

d) Breakdown of the production of integrated circuits (1973)

	1974	1980
United States	62 %	64 %
Japan	24 %	25 %
Europe	14 %	10 %
Other		1 %

Source: European "peri-informatique" industry  
Report SEMA 1976

5.5 Estimated turnover of leading manufacturers of semiconductor components in millions \$ in 1973.

United States

Texas	611
Motorola	458
Fairchild	287
RCA	172
National Semi-conductors	153
ITT	122
G.E.	115
SIGNETICS	99
General Instruments	99

Europe

Philips (N)	325
Siemens (FR)	145
SGS (I)	84
AEG (FR)	78
SESCOSEM (F)	69

Japan

Hitachi	210
Toshiba	141
NEC	61 (en 1970)

Source : Electronic Components Programme  
of the Federal Republic of Germany 1974-78

**5.6. Component production in enlarged EEC(1974) (\$ m)**

	Semi-conductors	Integrated circuits	Passive Components
Belgium	42	10	126
Denmark	1 [4]	-	35
France	322	74	570
Italy	86	29	120
Netherland	119	22	122
U.K.	256	110	526
West Germany	449	119	1.014
Ireland	-	-	-
<b>Total E.E.C.</b>	<b>1.275</b>	<b>364</b>	<b>2.513</b>

**Source :** Mackintosh Yearbook of West European Electronics :  
Date - 1976.

**5.7. Component market in enlarged EEC (1974) ( \$ m)**

	Semi conductors	Integrated circuits	Passive Components
Belgium	75	20	129
Denmark	27	7	62
France	340	126	591
Italy	164	63	172
Netherland	101	42	156
U.K.	380	162	625
West Germany	599	227	885
Ireland	-	-	-
<b>Total E.E.C.</b>	<b>1,686</b>	<b>647</b>	<b>2,620</b>

**Source :** Mackintosh Yearbook of West European Electronics :  
Date - 1976.

5.8 Funding by the Federal Ministry for Research and Technology  
in electronic components (in million of DM)

	<u>1969 - 73</u>	<u>1974</u>	<u>1974 - 1978</u>
Integrated circuits	20.8	16.0	85.5
Optoelectronic components	14.2	10.0	62.0
Materials development	3.0	5.0	36.0
Manufacturing processes for semiconductors	11.3	7.0	28.5
Development of fundamental principles and new components	14.1	7.5	56.0
Project guiding and studies	1.4	1.0	7.0
<u>Promotion target due to expire in 1974</u>			
Junction and hybrid circuits	2.8	4.5	-
Semiconductor power components	10.5	5.5	-
Transistors and diodes	6.1	0.5	

5.9 Promotion funds for other measures in the electronic components field  
(in million of DM)

		<u>1969-1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>Total</u>
Second data-processing programme	Circuitry	36.5	7	6	5.5	5	60
	High-speed stores	22.3	4.2	4	4	4	38.5
Space research and technology	Passive components	2.6	-	-	-	-	2.6
	Transit-time tubes	3.8	1	0.9	-	-	5.7
	Picture tubes	0.06	-	-	-	-	0.06
	Semiconductors	3.6	0.2	0.05	-	-	3.85
	Integrated circuits	1.5	-	-	-	-	1.5
Defence research and development	Solid-state physics	38.75	2.04	1.84	8	8.8	72.21
	Electronic components						
	Optoelectronic components	4.21	5.05				
	Technology	2.25	0.5	0.5	0.5	0.7	4.45
German Research Association	Semiconductor electronics	8.2	1.7	1.9	1.7	( )	13.5
	Ontoelectronics	0.6	1	1.2	1.4	( )	4.2
	Special research fields	38.5	8.4	9.8	9.9	( )	66.6

Source : Electronic Components Programme of the Federal Republic of Germany 1974-1978.

5.10. RD Budgets in semi-conductors of the American Companies in 1973

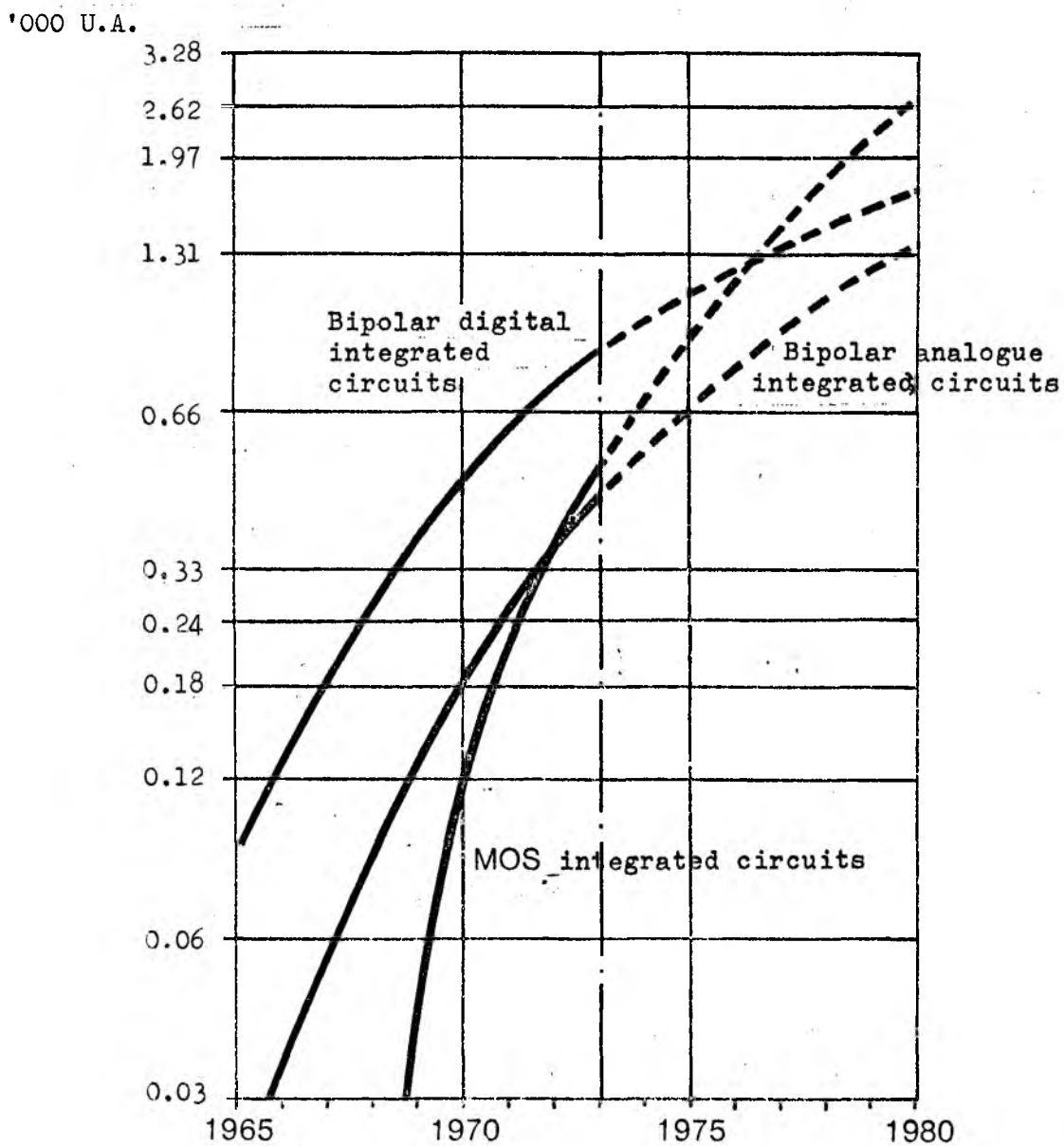
	<u>IBM*</u>	<u>Motorola</u>	<u>Texas Instr.</u>	<u>Fairchild</u>	<u>Signetics</u>
in Million \$	~ 90	95	90	25	7
in % of turnover	15 %	6.6 %	~ 7 %	~ 7 %	6.5 %

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\* IBM components incorporated.

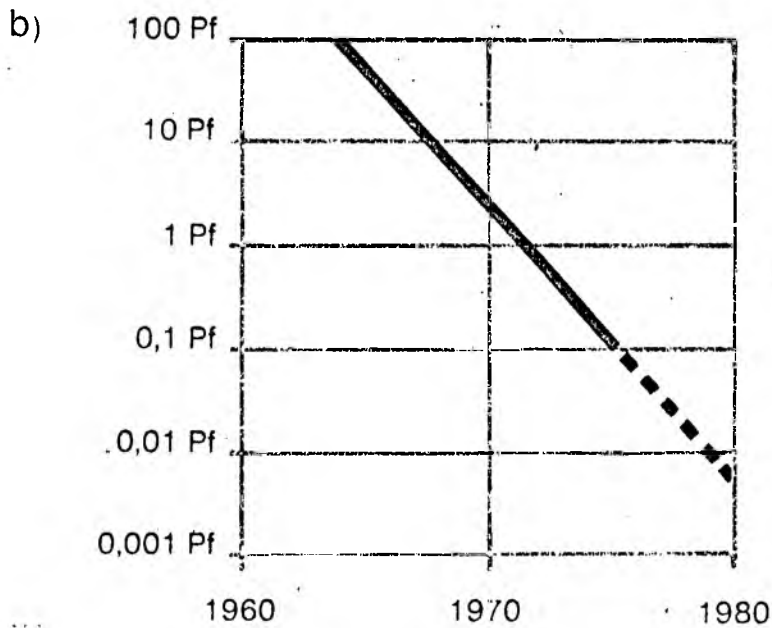
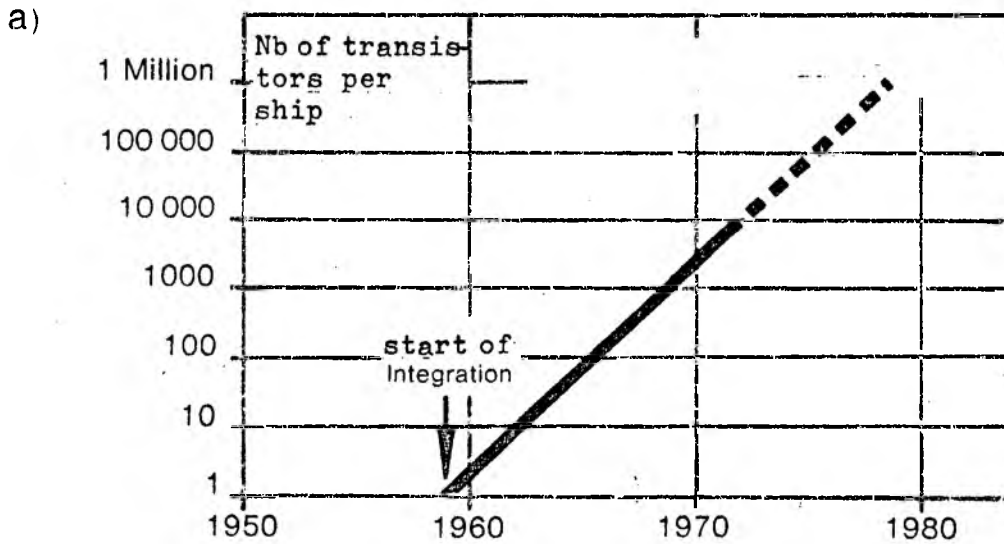
Source : Hearings of the Committee on the  
Judiciary United States Senate. Part 7.  
The Computer industry 1974

5.11 Previous development and future trends in the world market for integrated circuits.



Source: Electronic Components Programme of the Federal Republic of Germany 1974 - 1978

- 5.12 a) Development of packing density in monolithic integrated circuits.  
b) Drop in price per logical unit (transistor) with complete integration.



100 Pf = 0,33 EUR

Source : Electronic Components Programme of the Federal Republic of Germany 1974-1976

5.13. Share of integrated circuits used in data-processing in the USA

a) Proportion of integrated circuits used in data-processing in the USA in 1975

Captive production            90%  
Commercial production        55%

b) Source and application of the integrated circuits in the USA in 1975 in M \$

	Captive Production	Commercial Production	Total
Computers and Peripherals	400	600	1 000
Industry and consumer products	25	300	325
Gouvernement and military	25	200	225
Total	450	1100	1550

Source : Trends in the integrated circuit industry -  
Arthur D. Little Inc.



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STATE AIDS - PUBLIC AUTHORITY  
EXPENDITURE ON D.P.

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6.1 FEDERAL REPUBLIC OF GERMANY

Period 1967-1975 :

1°) Grants to industry for equipment

a/ 1967-1970

Ministry of Economics + Finance	112.4 MDM
Ministry of Education + Science	128.2 MDM
	<hr/>
	240.6 MDM

b/ 1971-1975

Ministry of Economics + Finance	188.- MDM
Ministry of Education + Science	517.4 MDM
	<hr/>
	705.4 MDM

say 946 MDM for 1967-1975

2°) D.P. education

	Total	Higher education budget	Professional training centres
1967-1970	47 MDM	43 MDM	4 MDM
1971-1975	919.9 MDM	757.9 MDM	162 MDM

say 966.9 MDM for 1967-1975.

3°) DP Applications :

- a) 1967-1970 : overall budget 57 MDM
- b) 1971-1975 : (grants)
- |                                 |                                    |
|---------------------------------|------------------------------------|
| Ministry of Economics + Finance | 79 MDM (packages)                  |
| Ministry of Education + Science | 479 MDM (systems +<br>development) |
|                                 | 558 MDM                            |
- say 615 MDM for 1967-1975

4°) Basic Research + special programmes :

- a) 1967-1970 : 42 MDM
- b) 1971-1975 : 226.6 MDM
- 268.6 MDM

Summary :

	Material	Education	Applic.	Basic Research	<u>Total</u>	
	MDM	MDM	MDM	MDM	MDM	M.U.A.
1967-1970	240.6	47	57	42	386.6	<u>127</u>
1971-1975	705.4	919.9	558	226.6	2,409.9	<u>790</u>
<b>Total 1967-1975</b>	<b>946</b>	<b>966.9</b>	<b>615</b>	<b>268.6</b>	<b>2,796.5</b>	<b><u>917</u></b>

5°) Electronic components :

Credits given by the Ministry of Research + Technology

1969-1970	1971-1975	1976-1978	Total
2.2	189.8	184	376 MDM or 123 M.U.A.
	\ 373.8 /		

It is worth noting that in the overall components programme for 1974-1978, 85.5 MDM are allocated to integrated circuits alone.

b) Budget for the third West German DP programme (1976-1979)Support for industry R + D

MDM

- System architecture and programme languages	73.0
- Data processing technology	76.3
- Remote peripherals	62.0
- Small systems (including process computers)	149.0
- Medium and large systems (including near-in peripherals)	194.9
	<hr/>
	554.3

Support for applications

- Information systems	165.0
- Medical information	141.3
- Teaching	15.5
- Computer-aided design (development and application)	66.0
- Process control	94.8
- Tele-processing	31.5
- Aid to users	42.0
- Shape recognition	5.5
	<hr/>
	561.6

Support for Training

- Supra-regional DP research programmes	86.5
- Scientific data exchange	6.0
- Regional computing centres	168.0
- Professional training centres	3.7
	<hr/>
	264.2

GMD (Gesellschaft für Mathematik und  
Datenverarbeitung)

194.8

TOTAL

1,574.9 MDM or 516 M.UA

Breakdown of support compared with the 2nd programme :

	<u>2nd programme</u>	<u>3rd programme</u>
Industrial R + D	40 %	35 %
Applications	31 %	36 %
Training	21 %	17 %
GMD	8 %	12 %

Sources : - German delegation  
2nd and 3rd d.p. programmes in Germany

6.2. FRANCE1°) Grants to industry for equipment (2nd DP plan):

1967-1970 : 120 MF/year

1971-1975 : 153 MF/year

Overall, and including peripherals + components :

1967-1970 : 600 MF

1971-1975 : 870 MF

Beyond this, FDES have granted to CII to an annual maximum of 40 MF.

2°) D.P. Education :

National education budget : - Methods + systems	300 MF
- Final training	100 MF
- Grants for foreign <sup>n</sup> study	20 MF

3°) D.P. Applications (2nd DP plan) :

Specific actions : 1967-1970 40 MFF

1971-1975 120 MFF

Standardised software packages : reimbursable loans up to 50 % of  
the project : 1971-1975 : 40 MFF.4°) Teleprocessing :

DP budget of CNET with in the overall 6th plan :

256 MFF

5°) Research (2nd DP plan) :

IRIA-CRI budget : 1971-1975 : 200 MFF

<u>i.e. a total of</u>	1967-1970 :	600 MFF	or	115 MUA
	1971-1975 :	1,906 MFF	or	365 MUA
	<u>1967-1975 :</u>	2,506 MFF	or	480 MUA

Source : french delegation

6.3. UNITED KINGDOM

in £ M

	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75 estima- ted
International Computers (Holdings) Ltd.	4.00	3.25	2.25	11.95*	9.45	10.20
Advanced Computer Technology Project	0.43	0.63	0.45	0.67	0.61	0.40
Software Products scheme	-	-	-	0.03	0.06	0.15
Systems and software development	-	-	-	1.45	0.78	0.45
Central Computer Agency expenditure on development studies	-	0.09	0.11	0.20	0.20	0.53
Other extra-mural contracts	0.44	0.36	0.23	0.17	0.14	0.17
Computer Aided Design Centre	0.45	0.49	0.42	0.67	0.97	1.32
National Computing Centre	0.60	0.64	0.60	0.77	1.06	1.15
Science Research Council	-	0.70	0.86	0.91	not available	not available
<b>TOTAL</b>	<b>5.92</b>	<b>6.16</b>	<b>4.92</b>	<b>16.82</b>	<b>13.27</b>	<b>14.37</b>
<b>in MUA</b>	<b>11</b>	<b>12.3</b>	<b>9.8</b>	<b>23.6</b>	<b>26.5</b>	<b>28.7</b>

General total 1969-1975 = M £ 61.46  
or 107 MUA

Remarks :

- These figures do not include regional industrial development aid nor do they include computer related R & D expenditure in Government research establishments which is not separately identifiable.

\* Including purchase of shares : under the Industrial Expansion Act 1968 the Government paid £ 350,000 in 1968/69 and £ 3,150,000 in 1972/73 for the purchase of 3.5 M £ 1. shares in International Computers (Holdings) Ltd.

Source : UK delegation.

6.4 BELGIUM

1) Progress contracts \*

Commitments by the Belgian State

a) The Belgian State has given an undertaking that each year as from 1 January 1971 and for a period of five years public authorities or similar bodies will award Siemens and Philips contracts for computer rental (including terminals and peripherals) amounting to a minimum annual rental of Bfrs 65 million.

The minimum commitments by the State were as follows :

in million Bfrs	1971	1972	1973	1974	1975
Annual total	65	130	195	260	325
Cumulated amount	65	195	390	650	975

b) The Belgian State has also undertaken to ensure that the signatory firms receive each year 25 % of the new contracts included in the annual plan for the distribution of data processing orders when this 25 % represents an amount higher than the minimum annual rental of Bfrs 65 million.

The new contracts concern new installations or extensions exceeding by more than 10 % in value that of the installed hardware.

Commitments by the signatory firms

	1970	1971	1972	1973	1974	1975	Total
SIEMENS							
- Investment million Bfrs	580	540	132	583	-	412	2247
- New jobs	420	2900	851	2450	-	1150	7771
PHILIPS							
- Investment million Bfrs	-	-	2425	300	-	470	4365 **
- New jobs	-	-	3000	400	-	400	5400 à 6000 **

\* Non-gouvernemental source : Courrier hebdomadaire du CRISP - May 1975

\*\* End of programme planned for 1977



The first progress contracts expired on 1 January 1976 and at present there is no information as to whether or not they will be extended.

On the advice of the belgian expert, a precise schedule of their actual application is not yet available.

2) National programme for the encouragement of data processing research :

Amounts in million Bfrs				(Estimates)			
1971	1972	1973	1974	1975	1976	1977	1978
5.7	34.9	56.8	89.2	98.3	83.4	46.4	3.4

In addition a reserve of Bfrs 7.7 million has been set up for unforeseen expenditure. The estimated total for the programme amounts to Bfrs 426 million.

3) Feasibility study concerning regionalisation of data-processing :

Bfrs 175 million.

Source : belgian delegation

SUMMARY :

Research 1971-1974 : Bfrs 186.6 m                    4 m U.A.  
                  1975-1978 : Bfrs 231.5 m                    5 m U.A.

Studies 1 August 1976/  
          1 July 1979 : Bfrs 175 m                    3.8 m U.A.

Progress contracts  
          1971-1975 : Bfrs 1,950 m \*                    42 m U.A.

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\* It must be recalled that this last figure is provisional and the source is not governmental.

6.5 ITALY

Since the end of 1968, there has been an IMI fund for the financing of applied industrial research without any sectoral orientation or demarcation. "Agevolato" credit (on favourable terms) can be granted to cover up to 70 % of the research costs.

In addition, a law on financing from the IMI fund passed in October 1974 introduced non-repayable R&D subsidies that cannot exceed 20 % of the cost of the project (but can be granted in addition to other types of financing).

\* Finally, a law of 7 June 1975 made a contribution of capital to the IMI fund intended for the applied electronics, telecommunications and data processing sectors. This amounted to Lit 60,000 million, broken down as follows :

1975	1976	1977	1978
10	10	20	20

Little aid has so far been granted to the data processing sector. From the total amount of Lit 137,000 million (up to June 1974) Olivetti, the largest Italian industrial company, has received financing on favourable terms totalling Lit 5 500 million in the period 1970-75 compared with the firm's R&D investment of about Lit 74,000 million in the same period.

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\* Note by the secretariat.

6.6. Comparison of state aid given within the Community 1971-1975

	A HW industries	B Applications and research	C Education	Total A + B
FRG	705.4 MDM 231 MUA	784.6 MDM 257 MUA	919.9 MDM 302 MUA	1.490 MDM 489 MUA
France	870 MFF 167 MUA	616 MFF 118 MUA	420 MFF 81 MUA	1.486 MFF 285 MUA
U.K.	£M 37.1 64 MUA	£M 18.44 32 MUA		£M 55.54 96 MUA
Belgium	1,950 MFB 42 MUA	186.6 MFB 4 MUA		2,137 MFB 46 MUA
Total in MUA	504 MUA	411 MUA	[ 382 MUA ]	915 MUA
Annual average	101 MUA	82 MUA	[ 76 MUA ]	183 MUA

Exchange rates used are those of SOEC 1975 . See preliminary remark at the beginning of present annex.

6.7. JAPAN

a) Subsidies given by MITI (in Billiards Yen)

	1973	1974	1975
General promotion of the development of computers	17.26	19.65	14.58
Systems development	6.35	8.07	11.09
Information technology Promotion agency (IPA)	0.785	0.996	1.322
Operating expenses	-	9	12
Financial meas. for the prom. of IP (loans)	-	9	12
Japan development Bank-(loans)	27	31	41,5
Others	0.143	0.209	0,215
Promot. of IP in small and medium Cies..	0.260	1,139	1,401
Promotion of Government IP	1.066	1.548	2.266
TOTAL subsidies	25.8	31.6	30.9
MUA	72.8	89	87.2
Loans	27	40	53.5
MUA	76.2	113	151

Sources : JIPDEC report n° 24 - 1975

SOBEMAP study

b) Breakdown of the category General Promotion of the development of computers

	1973	1974	1975
Development of new computer models	14,4	15,25	12,48
Development of peripherals	0,936	1,4	0,9
Promotional measures for the I.P. industry	0,6	1,2	1,2
Integrated circuits	1,7	1,8	0
Total in Billiards Yen	17,26	19,65	14,58
TOTAL in MUA	48.7	55.4	41.1

Source : Computers in Japan 1975-1976

6.8 Breakdown of european based computers (in percent)  
on the German market - 1.11.1975

Manufacturers	Total market	Public sector
German or european based	20%	44%
extra european of which IBM	80% (60%)	56%
Total	100%	100%

Source: Deutscher Bundestag 7. Wahlperiode  
Drucksache 7/4553 - 7-1-1976

6.9. Survey of DP systems installed in the public sector\* in the FRG by manufacturers at 1.11.1975 (small systems excluded).

Manufacturers	Number (total)	Number of rent installations 1)	Number of purchased installations 2)	Monthly rental 3)	Expenses for purchasing Mio DM 4)
1. IBM	87	80	7	13.5	37.8
2. CDC	4	-	4	0.1	3.6
3. UNIVAC	1	-	1	0.1	0.0
4. Honeywell-Bull	1	-	1	0.0 <sup>5)</sup>	0.0
5. DEC	3	-	3	0.0 <sup>5)</sup>	6.7
6. CII	1	-	1	0.0 <sup>5)</sup>	0.0
7. Telefunken	15	4	11	1.1	15.0
8. Siemens	60	48	12	5.9	35.7
TOTAL	172	132	40	20.7	98.8

- 1) Data-processing systems the elements of which are principally leased.
- 2) Data-processing systems the elements of which are principally purchased.
- 3) Expenses for leasing and services.
- 4) Expenses for purchased installations since 1971 and in operation.
- 5) Rounded

\* Federal administration, public firms and corporates chiefly financed by the Federal Republic.

Railways, Mail and big research institutes are also included (Diebold Management, January 1976).

Source : Deutscher Bundestag 7. Wahlperiode  
Drucksache 7/4553 of 7.1.1976.

6.10 Acquisition of computers in colleges for Higher Studies  
in the FRG supported by the 2nd Data Processing Programme.

Manufacturers	Total number	Number of rented instal.	Number of purchased instal.
IBM	4	1	3
CDC	6	-	6
DEC	1	1	-
Burroughs	1	1	-
Siemens	7	5	2
CGK *	12	4	8
TOTAL	31	12	19

\* Computer-Gesellschaft Konstanz

Source : Deutscher Bundestag  
7. Wahlperiode - 225 Sitzung  
20-2-1976



6.11 Computers installed in the public sector in France (numbers and value in MFF)

Manufacturers	Administrations			Public entreprises			Total		
	number	value in MFF	% in value	number	value in MFF	% in value	number	value in MFF	% in value
<u>FRENCH MANUFACTURERS</u>									
C.I.I.	336	1,231	34	299	655	16	635	1,886	24
OTHER French Man.	227	94	2	246	112	3	473	206	3
Other european "	36	100	3	45	72	2	81	172	2
<u>AMERICAN MANUFACTURERS</u>									
IBM	293	1,333	36	195	2,215	54	494	3,548	46
H.B. (Honeywell Bull)	180	337	9	173	311	8	353	648	8
CDC	28	139	5	29	255	6	57	454	6
BURROUGHS	42	144	4	15	46	1	57	190	2
UNIVAC	29	117	3	31	282	7	60	399	5
OTHERS	203	115	3	182	116	3	385	231	3
TOTAL	1,380	3,670	100	1,215	4,064	100	2,595	7,794	100

The estimates by value are based on the average installation costs.

SOURCE : "L'Informatique dans les Entreprises publiques au 1er Janvier 1975"  
Ministère de l'Industrie et de la Recherche - Direction générale de l'Industrie.

6.12 Public sector computer park, in number and value (£M) broken down by manufacturers in the United Kingdom end 1974

Manufacturers	Central Administrations			Local Administrations			Public corporations			TOTAL	
	number	value £ mil- lion	% by value	number	value £ mil- lion	% by value	number	value £ mil- lion	% by value	number	value £ mil- lion
<u>NATIONAL</u> Manufacturers											
ICL	247	94.1	50	235	44	54.2	176	57.1	37.4	658	195.2
GEC	268	11.2	6	18	1	1.2	105	6.3	4.1	391	18.6
FERRANTI	125	7.3	3.9	3	0.3	0.4	113	7.8	5.1	241	15.4
COMPUTER TECHNOLOGY	115	2.3	1.2	2	<0.1	<0.1	43	0.9	0.6	160	3.3
PLESSEY	3	0.5	0.3	3	0.8	1	1	<0.1	<0.1	7	1.4
DIGICO	41	0.2	0.1	10	<0.1	<0.1	30	0.2	0.1	81	0.4
OTHERS	22	1.1	0.6	3	<0.1	<0.1	15	0.5	0.4	40	1.7
<u>TOTAL</u>	821	116.7	62.1	274	46.7	57	483	72.9	47.7	1578	236.3
-----											
<u>FOREIGN</u> Manufacturers											
IBM	86	31.3	16.6	85	18.2	22.4	118	50.5	33	289	100.0
HONEYWELL	83	3.9	2.1	43	6.2	7.6	81	8.1	5.3	207	18.2
UNIVAC	14	6	3.2	12	2.3	2.9	24	6.6	4.3	50	14.9
CDC	15	13.8	7.3	-	-	-	3	0.2	0.1	18	14.0
BURROUGHS	76	6.1	3.2	32	1.6	1.9	7	0.7	0.5	115	8.4
DEC	264	4.3	2.3	147	1.9	2.3	147	1.9	1.3	558	8.1
NCR	10	0.4	0.2	63	3.1	3.9	23	1.1	0.7	96	4.6
XEROX DATA	12	2	1	-	-	-	5	1.3	0.9	17	3.3
PHILIPS	20	0.2	0.1	29	0.3	0.4	12	0.1	<0.1	61	0.6
OTHERS	186	3.6	1.9	52	1.1	1.4	580	9	5.8	818	13.7
<u>TOTAL</u>	766	71.6	38.0	463	34.7	42.4	1000	79.5	52	2229	185.8
-----											
<u>TOTAL GENERAL</u>	1587	188.3	100	737	81	100	1483	152.4	100	3807	421.8

The estimates by value are based on weighted average installation costs.

SOURCE : U.K. delegation.

6.13 Computers installed (by number) in the public sector  
a) in Italy - Breakdown by sectors and manufacturers in 1973

USERS	IBM	HONEYWELL	UNIVAC	SIEMENS	TOTAL
Foreign Affairs	1	-	-	-	1
Transport :	4	7	1	2	14
Lower House, Senate	2	-	-	-	2
"Cour des Comptes"	-	3	-	-	3
Statistical Institute	6	-	-	-	6
Attorney general	-	-	1	-	1
Foreign Trade	1	-	-	-	1
Agriculture	-	1	-	-	1
Industry	-	1	-	-	1
"Mezzogiorno"	1	-	-	-	1
Justice	1	1	2	-	4
Merchant Navy	1	-	-	-	1
Labour	-	-	-	1	1
Public Works	-	1	1	-	2
Education	-	1	2	-	3
Health	4	-	-	-	4
Interior	2	1	-	2	5
Treasury	3	2	7	-	12
Finance	110	23	-	-	133
P.T.T.	6	1	3	-	10
<b>TOTAL</b>	<b>142</b>	<b>42</b>	<b>17</b>	<b>5</b>	<b>206</b>
<b>PERCENTAGE</b>	<b>68.9</b>	<b>20.3</b>	<b>8</b>	<b>2</b>	<b>100 %</b>

Source : Italian delegation

6.13. Computers installed in the public sector in Italy

b)

	<u>Number</u>	<u>Value</u>
Percentage of computers of the central public sector versus the total sector (1974) : .....	8 %	14 %
For the whole public sector : .....	16-18 %	20 %
Estimate of annual DP expenses of public administration : .....		200 Billiards Lit
Value of the park end 1973 : .....		242 M \$
Value of installed terminals end 1973 : .....		8 M \$ (+ 9 % from the national total)

Forecast by number and value for the years 1975, 1976, 1977

Years	Computers		Terminals		Expenses (M \$)
	Number	Value (M \$)	Number	Value (M \$)	
1975	740	260	1,730	11	23
1976	840	331	1,980	13	32
1977	980	407	2,450	15	38

Source : Italian delegation.

6.14 Belgian Central Government Expenditure on data-processing, Departmental and other major public services.

a) Breakdown of expenses foreseen for 1974

	in MFB	in %	in %
Prime Minister's Office .....	92.7		3.1
Economic Affairs .....	417.1	14.1	14.1
Agriculture .....	14.7		0.5
Interior .....	3.1		0.1
Finance .....	570.1	19.3	19.3
Justice .....	36.4		1.3
Public Works .....	60.8		2.1
Communications .....	1,141.4	40.3	40.3
Public Health .....	18.9		0.6
Education .....	58.3		2.0
Defence .....	486.5	16.5	16.5
<b>Total</b>	<b>2,900.7</b>	<b>90.2</b>	<b>100</b>

b) Breakdown of expenses in % (1974)

Hardware	Software	Employees	Services	Others
53.1	0.3	32,8	6.4	7.4

c) Breakdown by manufacturers of expenses for leased hardware (1974)

Manufacturers	Number of leased computers	MFB annual cost foreseen for 1974	%
IBM	23	353.6	31.4
SIEMENS	38	604.4	53.7
PHILIPS	2	34.8	3.1
OTHERS	14	132.5	11.8
<b>Total</b>	<b>77</b>	<b>1,125.3</b>	<b>100</b>

d) Breakdown by manufacturers of contracts awarded by public administrations  
(in million FB)

Manufacturers	1971	1972	1973	1974	(Jan . 1975 )	Total	%
Siemens	92,9	132,1	24,5	75,8	(3,1)	328,5	46,6
Philips	9,5	69,0	36,0	6,7	-	121,1	17,2
IBM	21,4	106,9	10,9	22,6	-	161,8	23,0
Others	3,8	28,5	6,5	32,4	(22,0)	93,2	13,2
Total	127,6	336,5	77,9	137,5	(25,1)	704,6	100

Source of tables 6.14 a to d : Courrier Hebdomadaire of CRISP -  
May 1975

In the view of the belgian expert the above information should be treated with reserve. For example parts of installations of the automatic management type, are not taken into account, the difficulty being to establish the precise limits of a computer configuration. This remark applies notably and in particular to the "other" like in table d. Moreover the above data are provisional.

6.15 Data-processing RD expenses of the public Administrations in the Community Countries  
 a) Promotion of data-processing and of Automation

Country	1969		1970		1971		1972	
	National value	EUA (1000)	National value	EUA (1000)	National value	EUA (1000)	National value	EUA (1000)
West Germany	117,182	38,420	126,034	41,322	296,400	97,180	333,575	109,365
Belgium	2,943	64	13,598	295	14,679	319	15,864	344
Denmark	**	-	12,834	1,782	25,497	3,541	30,211	4,195
France	200,030	38,319	266,500	51,053	300,623	57,590	340,188	65,170
United Kingdom	**	-	4,500	7,812	2,365	4,105	13,028	22,618
Italy	1,518	1,904	733	919	1,661	2,082	2,025	2,538
Ireland	**	-	-	-	-	-	-	-
Netherlands	4,066	1,299	5,770	1,843	6,620	2,115	7,401	2,364
<b>Total EEC</b>		<b>80,006</b>		<b>105,026</b>		<b>166,932</b>		<b>206,597</b>

6.15 Data-processing RD expenses of the public Administrations in the Community Countries  
 b) Promotion of data-processing and of Automation.

country	1 9 7 3		1 9 7 4		Hardware 1 9 7 5		Studies and programming 1 9 7 6	
	National value	EUA (1000)	National value	EUA (1000)	National value	EUA (1000)	National value	EUA (1000)
West Germany	403,230	132,206	456,402	149,640	202,000	66,229	61,523	20,171
Belgium	12,730	276	121,207	2,634	- **	-	74,512	1,619
Denmark	31,219	4,335	29,953	4,160	- **	-	12,612	1,751 ***
France	323,832	62,036	446,500	85,536	598,300	114,616	53,700	10,287
United Kingdom	13,500	23,437	15,200	26,388	10,694	18,565	430	746
Italy	1,831	2,295	1,762	2,208	8,606	10,784	2,680	3,359
Ireland	-	-	-	-	- **	-	103	179
Netherlands	7,998	2,555	9,328	2,980	- **	-	9,127	2,915 ***
Total EEC		227,141		273,546		210,194		41,028

\* For 1975, change of classification enables the expenses on HW to be distinguished (chap. 6, Division 651), and studies and programming systems (chap. 7, Div. 71) which represent in the view of the experts 80 % of the software work.

\*\* Figures not available

\*\*\* Total expenses are shown here without any division.

Source : SOEC Report "Public funding of research and development in the Community countries 1974/75 The figures are drawn from Chapter 9 from the old NABS version for 1969-73 and, from 1974, from Chapter 51 of the new NABS version. Rate of conversion used is EUA of 1975.



6.16 Estimates of total DP costs within the Dept. of Defence for the fiscal year 1973

Unit = Billion \$

	Air Force	Army	Navy	Others	Total
Hardware	0.4 to 0.5	0.3	0.3 to 0.5	0.1	1 to 1.4
Software	1 to 1.3	0.7 to 0.8	1 to 1.3	0.2	2.9 to 3.6
Others	0.8 to 1.2	0.6 to 0.8	0.8 to 1.2	0.1 to 0.2	2.3 to 3.3
Total	2.2 to 3	1.5 to 1.9	2.2 to 3	0.4	6.2 to 8.3

Source : ADP costs in the Defense Department. David A. Fisher  
Institute for Defense Analyses - Oct. 1974.

6.17 Computers of the US federal government by manufacturers and agencies in 1975 in number.

Manufacturer Agency	BUR	CDC	DEQ	DGC	HON	HPC	IBM	UNI	VAR	XDS	OTHER	TOTAL
AGRICULTURE	2	6	3	5	-	4	26	3	-	-	7	56
COMMERCE	-	8	41	99	7	6	25	14	6	5	83	294
ENERGY R&D ADMIN.	-	72	1,013	101	61	98	107	11	55	44	342	1,904
GENERAL SVCS. ADMIN.	1	-	-	-	20	-	3	-	-	4	-	28
HEALTH, EDUC., & WELF.	-	5	31	1	4	4	51	19	1	1	17	134
INTERIOR	5	9	17	1	8	8	13	1	-	-	7	69
NAT'L AERO, SPACE ADM	-	74	144	33	102	46	80	165	66	188	216	1,114
TRANSPORTATION	1	3	24	5	31	8	125	96	3	6	15	317
TREASURY	5	11	1	2	59	-	51	2	-	-	19	150
VETERANS ADMIN.	-	2	47	7	9	8	43	-	1	-	9	126
OTHER CIVIL	3	9	11	35	15	4	52	23	15	2	43	212
DEPT. OF DEFENSE	298	342	367	83	390	175	744	1,034	46	110	656	4,245
TOTAL	315	541	1,699	372	706	361	1,320	1,368	193	360	1,414	8,649

Remark : of the total number of computers, 10 % have 2 or more central units linked together within a system.

Source : Inventory of ADF equipment in the US Government. June 30, 1975

6.18 Breakdown of U.S. Federal Government owned computer  
by manufacturer, as % (in number)

Manufacturer	1960 %	1965 %	1970 %	1975 %
BUR	10.4	6.7	3.9	3.6
CDC	0.2	10.3	7.7	6.3
DEQ	-	0.6	9.5	19.6
DGC	-	-	-	4.3
HON	0.2	4.4	5.6	8.2
HPC	-	-	-	4.2
IBM	54.8	42.3	26.4	15.3
UNI	10.4	20.1	22.7	15.8
VAR	-	-	-	2.2
XDS	-	0.6	4.3	4.2
other	24.0	15.0	19.9	16.3
Total	100	100	100	100

Source : Inventory of ADP equipment  
in the US Government -  
June 30, 1975

6.19 Inventory of systems elements installed during 1975  
within the US federal government in value (M \$)

TYPE OF ELEMENT	
Central units purchase leasing	1,052 315
Memory units purchase leasing	1,033 517
Input-output purchase leasing	636 244
Communication terminals purchase leasing	110 124
Other purchase leasing	145 123
TOTAL purchase leasing	2,978 1,324

Remarks : 1°) of which IBM  
purchase : 1,148  
leasing : 393

2°) one may notice the greater amount of purchased installations versus leased ones.

Source : Inventory of ADP equipment in  
the US Government -  
June 30, 1975.

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EXPORTS - IMPORTS OF THE E.E.C.

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Imports - Exports

Preliminary comments on Table 7

The following data are taken from official figures published every year by the SOEC on the basis of information supplied by member countries. However, caution must be exercised in analysing the figures given.

For example : Exports by France to Belgium for heading 84.53.30 (compact processing units) are given a value of 344,000 u.a. in the 1974 statistics whereas Belgian imports from France for the same year amount to 658,000 u.a.

The situation is similar for Belgian exports to France for the same year, put at 733,000 u.a., whereas French imports from Belgium are given as 404,000 u.a.

The main causes of these discrepancies include the following :

- exports may be given in FOB\* or CIF\*\* values;
- the exports of one Member State are not included in the imports of another Member State when the goods come under special arrangements (bond, inward or outward processing);
- in most countries, there are almost no export duties and therefore the customs authorities have little interest in checking the volume of such exports. Some exports need no documents and are therefore not recorded. Imports, on the other hand, undergo strict material and financial checks so that customs duties can be levied.
- exports from one member country are not recorded on the same date as the corresponding imports by its trading partner, so discrepancies may arise in annual statistics;
- goods may appear under one tariff heading for export and under a different heading for import.

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\* Free on board

\*\* Cost insurance freight

For all these reasons, together with certain temporary anomalies (such as the inclusion of compact processing units, central units and local peripherals under the same heading 84.53.30 by the United Kingdom and Ireland\* - see Tables 7.4, 7.5 and 7.6), the following statistics cannot be considered a strictly accurate reflection of the real situation. However, the published figures come from official data supplied by the Member States and therefore form the most accurate basis that exists at present.

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\* This peculiarity, due to a classification specific to United-Kingdom and Ireland prior to their entry into the Common Market, will disappear in futur years in line with a Directive of the Council Minutes of 24 June 1975 n° 1736 (Official Journal n° 183 - 1975).

7.1 TRADE BALANCE OF THE EEC IN 1974 FOR DATA PROCESSING EQUIPMENTS  
value 1000 EUR

Classification NIMEXE *	United States	Japan	extra EEC = World
8453.10 Analogue machines and hybrid machines	- 21,196	+ 1,400	- 4,583
8453.30 Integrated processing units comprising in the same housing at least a central processing unit and an input/output unit	- 209,538	+ 21,229	- 59,522
8453.40 Central processing units; processors consisting of the arithmetical and logical elements and the control units	- 67,091	+ 4,960	- 375
8453.50 Separate central storage units	- 9,784	- 53	- 13,651
8453.61 Peripheral storage units	- 80,283	+ 620	- 42,255
8453.65 Peripheral input and/or output units	- 57,433	+ 4,312	- 52,262
8453.69 Peripheral units other than input and/or output and storage units	- 80,386	+ 4,198	- 61,674
8453.91 Punches, verifiers and calculators	- 4,995	+ 335	- 13,492
8453.99 Magnetic or optical readers, machines for transcribing data onto data media in coded form not other wise	- 77,588	+ 1,237	- 71,309
8455.96 Spares and accessories for automatic information machines and their storage units and other machines of heading No. 8453	- 229,494	+ 38,925	- 86,879
Total	- 837,788	+ 77,163	- 406,002

\* NIMEXE = Nomenclature of Goods for the External Trade Statistics of the Community and Statistics of Trade between Member States



7.2 EXPORTS OF DATA PROCESSING EQUIPMENTS OF THE EEC IN 1974  
value 1000 EUR

Classification NIMEXE	United States	Japan	extra EEC = World
8453.10 Analogue machines and hybrid machines	9,013	1,408	28,380
8453.30 Integrated processing units comprising in the same housing at least a central processing unit and an input/output unit	17,400	21,936	201,429
8453.40 Central processing units; processors consisting of the arithmetical and logical elements and the control units	2,823	5,099	76,025
8453.50 Separate central storage units	302	53	1,462
8453.61 Peripheral storage units	1,584	1,122	45,831
8453.65 Peripheral input and/or output units	3,674	4,489	49,392
8453.69 Peripheral units other than input and/or output and storage units	4,422	4,375	47,068
8453.91 Punches, verifiers and calculators	1,436	2,802	13,920
8453.99 Magnetic or optical readers, machines for transcribing data onto data media in coded form not other wise	6,080	1,650	20,000
8455.96 Spares and accessories for automatic information machines and their storage units and other machines of heading No. 8453	43,747	44,615	255,356
<b>Total</b>	<b>90,481</b>	<b>87,549</b>	<b>738,863</b>

7.3 IMPORTS OF DATA PROCESSING EQUIPMENTS OF THE EEC IN 1974  
value 1000 EUR

Classification NIMEXE	United States	Japan	extra EEC = World
8453.10 Analogue machines and hybrid machines	30,209	8	32,963
8453.30 Integrated processing units comprising in the same housing at least a central processing unit and an input/output unit	226,938	707	260,951
8453.40 Central processing units; processors consisting of the arithmetical and logical elements and the control units	69,914	139	76,400
8453.50 Separate central storage units	10,086	106	15,113
8453.61 Peripheral storage units	81,867	502	88,086
8453.65 Peripheral input and/or output units	61,107	177	101,654
8453.69 Peripheral units other than input and/or output and storage units	84,808	177	108,742
8453.91 Punches, verifiers and calculators	6,431	2,467	27,412
8453.99 Magnetic or optical readers, machines for transcribing data onto data media in coded form not other wise	83,668	413	91,309
8455.96 Spares and accessories for automatic information machines and their storage units and other machines of heading No. 8453	273,241	5,690	342,235
Total	928,269	10,386	1,144,865

7.4 TRADE BALANCE OF THE MEMBER COUNTRIES OF THE EEC IN 1974 FOR DATA PROCESSING EQUIPMENTS  
value 1000 EUR

Classification	NIMEXE	Federal Repu- blic of Ger- many	France	Italy	Nether- lands	Belg.-Lux.	United- Kingdom	Ireland	Denmark
8453.10	Analogue machines and hybrid machines	- 6,375	+ 22,869	- 1,207	- 10,483	- 1,356	- 1,018	-	- 596
8453.30	Integrated processing units comprising in the same housing at least a cen- tral processing unit and an input/ output unit	+ 67,486	- 9,067	- 5,513	- 14,918	- 2,141	- 4,472	+ 10,337	- 4,777
8453.40	Central processing units; processors consisting of the arithmetical and logical elements and the control units	- 43,871	- 51,640	+ 28,513	- 14,963	- 2,632	-	-	- 15,076
8453.50	Separate central storage units	- 3,364	- 3,453	- 4,238	- 1,774	- 5,016	-	-	- 7,498
8453.61	Peripheral storage units	+ 62,760	- 33,150	- 2,794	- 12,043	- 4,861	-	-	- 5,475
8453.65	Peripheral input and/or output units	- 81,174	+ 15,666	- 6,924	- 11,564	- 9,042	-	-	- 3,848
8453.69	Peripheral units other than input and/or output and storage units	+ 23,046	- 28,092	- 84,096	- 27,754	- 10,509	-	-	- 7,734
8453.91	Punches, verifiers and calculators	- 6,885	+ 3,383	- 8,029	- 5,474	- 3,978	+ 202	- 148	- 1,445
8453.99	Magnetic or optical readers, machines for transcribing data onto data media in coded form not other wise	- 14,962	- 63,604	- 18,190	- 2,059	- 1,006	-	- 26	- 394
8455.96	Spares and accessories for automatic information machines and their storage units and other machines of heading No. 8453	+ 160,773	+ 79,128	- 58,464	- 19,022	- 7,268	- 137,886	- 1,562	- 8,628
Total		+ 157,434	- 67,958	- 160,942	- 120,054	- 47,809	- 143,174	+ 8,601	- 55,471

7.5 IMPORTS OF DATA PROCESSING EQUIPMENTS FROM MEMBER COUNTRIES OF THE EEC FROM THE WORLD IN 1974  
value 1000 EUR

Classification NIMEX E	Federal Repu- blic of Ger- many	France	Italy	Nether- lands	Belg.-Lux.	United- Kingdom	Ireland	Denmark
8453.10 Analogue machines and hybrid machines	9,418	33,767	1,502	12,154	1,820	3,404	-	1,076
8453.30 Integrated processing units comprising in the same housing at least a cen- tral processing unit and an input/ output unit	21,801	12,436	5,590	29,518	11,877	304,438	15,717	5,695
8453.40 Central processing units; processors consisting of the arithmetical and logical elements and the control units	124,038	59,261	44,952	23,726	18,856	-	-	17,956
8453.50 Separate central storage units	4,229	4,759	4,659	1,863	5,528	-	-	7,684
8453.61 Peripheral storage units	79,451	54,624	2,932	17,476	10,838	-	-	5,636
8453.65 Peripheral input and/or output units	118,083	66,673	10,818	18,182	12,871	-	-	7,448
8453.69 Peripheral units other than input and/or output and storage units	37,002	59,875	123,378	29,356	19,185	-	-	8,537
8453.91 Punches, verifiers and calculators	10,664	15,835	8,110	5,827	4,890	7,019	167	1,588
8453.99 Magnetic or optical readers, machines for transcribing data onto data media in coded form not other wise	21,946	91,180	19,757	3,252	2,074	-	657	589
8455.96 Spares and accessories for automatic information machines and their storage units and other machines of heading No. 8453	201,599	128,040	91,049	42,843	32,348	332,910	11,592	10,161
Total	628,231	526,450	312,747	184,197	120,287	647,771	28,133	66,370

7.6 EXPORTS OF DATA PROCESSING EQUIPMENTS FROM MEMBER COUNTRIES OF THE EEC IN THE WORLD IN 1974  
value 1000 EUR

Classification NIMEXE	Federal Republic of Germany	France	Italy	Netherlands	Belg.-Lux.	United-Kingdom	Ireland	Denmark
8453.10 Analogue machines and hybrid machines	3,043	56,636	295	1,671	464	2,386	-	480
8453.30 Integrated processing units comprising in the same housing at least a central processing unit and an input/output unit	89,287	3,371	77	14,600	9,736	299,966	26,054	918
8453.40 Central processing units; processors consisting of the arithmetical and logical elements and the control units	80,167	7,621	73,465	8,763	16,224	-	-	2,880
8453.50 Separate central storage units	865	1,306	421	89	512	-	-	186
8453.61 Peripheral storage units	142,211	21,474	138	5,433	5,977	-	-	161
8453.65 Peripheral input and/or output units	36,909	82,339	3,894	6,618	3,829	-	-	3,600
8453.69 Peripheral units other than input and/or output and storage units	60,048	31,783	39,282	1,602	8,676	-	-	803
8453.91 Punches, verifiers and calculators	3,779	19,218	81	353	912	7,221	19	143
8453.99 Magnetic or optical readers, machines for transcribing data onto data media in coded form not other wise	6,984	27,576	1,567	1,193	1,068	-	631	195
8455.96 Spares and accessories for automatic information machines and their storage units and other machines of heading No. 8453	362,372	207,168	32,585	23,821	25,080	195,024	10,030	1,533
Total	785,665	458,492	151,805	64,143	72,478	504,597	36,734	10,899

7.7 TRADE BALANCE OF THE EEC IN 1974 FOR INTEGRATED CIRCUITS  
value 1000 EUR

Classification NIMEXE	United States	Japan	extra EEC = World
8521.61 Integrated circuits monolithic	- 124,606	- 613	- 160,052
8521.63 Integrated circuits hybrid	- 39,336	- 172	- 40,599
8521.69 Electronic microcircuits integrated circuits	- 11,811	- 140	- 10,989
8521.99 Parts and accessories of Photo- cells mounted piezo-electric crys- tals, semi-conductor devices elec- tronic microcircuits	- 21,933	- 2,808	+ 2,213
Total	- 197,686	- 3,733	- 209,427

7.8 EXPORTS OF INTEGRATED CIRCUITS OF THE EEC IN 1974  
value 1000 EUR

Classification NIMEX E	United States	Japan	extra EEC = World
8521.61 Integrated circuits monolithic	6,084	610	53,481
8521.63 Integrated circuits hybrid	483	27	3,176
8521.69 Electronic microcircuits integrated circuits	354	37	3,563
8521.99 Parts and accessories of Photo- cells mounted piezo-electric crys- tals, semi-conductor devices elec- tronic microcircuits	989	164	33,509
<b>Total</b>	<b>7,910</b>	<b>838</b>	<b>93,509</b>

7.9 IMPORTS OF INTEGRATED CIRCUITS OF THE EEC IN 1974  
value 1000 EUR

Classification NIMEX E	United States	Japan	extra EEC = World
8521.61 Integrated circuits monolithic	130,690	1,223	213,533
8521.63 Integrated circuits hybrid	39,819	199	43,775
8521.69 Electronic microcircuits integrated circuits	12,165	177	14,552
8521.99 Parts and accessories of Photo- cells mounted piezo-electric crys- tals, semi-conductor devices elec- tronic microcircuits	22,922	2,972	31,296
<b>Total</b>	<b>205,596</b>	<b>4,571</b>	<b>303,156</b>

7.10 TRADE BALANCE OF THE MEMBER COUNTRIES OF THE EEC IN 1974 FOR INTEGRATED CIRCUITS  
value 1000 EUR

Classification NIMEXE	Federal Repu- blic of Ger- many	France	Italy	Nether- lands	Belg.-Lux.	United Kingdom	Ireland	Denmark
8521.61 Integrated circuits monolithic	- 79,347	- 29,287	- 4,075	- 5,739	- 7,426	- 42,953	- 6,538	- 3,698
8521.63 Integrated circuits hybrid	- 2,976	- 11,493	- 17,537	- 8,593	- 257	-	-	- 382
8521.69 Electronic microcircuits integrated circuits	- 4,562	- 1,226	- 5,609	- 386	- 2,146	-	-	- 1,591
8521.99 Parts and accessories of Photo- cells mounted piezo-electric crys- tals, semi-conductor devices elec- tronic microcircuits	+ 21,466	- 1,184	- 6,242	+ 16,082	- 3,082	-	-	- 359
<b>Total</b>	<b>- 65,419</b>	<b>- 43,190</b>	<b>- 33,463</b>	<b>+ 1,364</b>	<b>- 12,911</b>	<b>- 42,953</b>	<b>- 6,538</b>	<b>- 6,030</b>



7.11 EXPORTS OF INTEGRATED CIRCUITS FROM MEMBER COUNTRIES OF THE EEC IN THE WORLD IN 1974  
value 1000 EUR

Classification NIMEXE	Federal Republic of Germany	France	Italy	Netherlands	Belg.-Lux.	United Kingdom	Ireland	Denmark
8521.61 Integrated circuits monolithic	71,090	17,885	12,926	18,771	1,174	37,691	-	121
8521.63 Integrated circuits hybrid	951	2,112	6,194	325	1,824	-	-	37
8521.69 Electronic microcircuits integrated circuits	775	1,957	6,113	1,322	143	-	-	79
8521.99 Parts and accessories of Photo-cells mounted piezo-electric crystals, semi-conductor devices electronic microcircuits	31,562	21,656	5,497	20,139	964	-	955	30
Total	104,378	43,610	30,730	40,557	4,105	37,691	955	267

7.12 IMPORTS OF INTEGRATED CIRCUITS FROM MEMBER COUNTRIES OF THE EEC FROM THE WORLD IN 1974  
value 1000 EUR

Classification NIMEXE	Federal Republic of Germany	France	Italy	Netherlands	Belg.-Lux.	United Kingdom	Ireland	Denmark
8521.61 Integrated circuits monolithic	150,437	47,172	17,001	24,510	8,600	80,644	-	3,819
8521.63 Integrated circuits hybrid	3,927	13,605	23,731	8,918	2,081	-	-	419
8521.69 Electronic microcircuits integrated circuits	5,337	3,183	11,722	1,708	2,289	-	-	1,670
8521.99 Parts and accessories of Photo-cells mounted piezo-electric crystals, semi-conductor devices electronic microcircuits	10,096	22,840	11,739	4,057	4,046	-	7,493	389
Total	169,797	86,800	64,193	39,193	17,016	80,644	7,493	6,297