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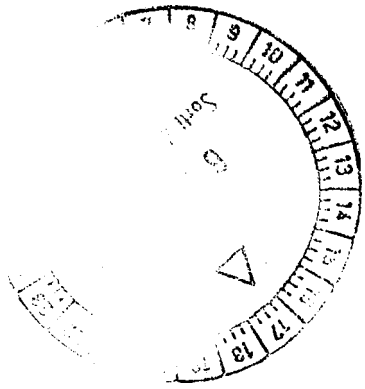

ANNUAL REPORT

OF THE DATA PROCESSING DEPARTMENTS OF THE COMMISSION

1982

(Report from the Commission to the Council and European Parliament)

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INTRODUCTION

The Commission's Steering Committee for Data Processing (CDIC) has decided to change the content of the annual reports by including the short- and medium-term plans, which also indicate the resources required.

The constant expansion of data processing requires major investment in some years in order to keep down increases in expenditure in subsequent years. A mere report of the activitives in the past year is therefore not sufficient to explain the problems and results of data processing management.

While the plan has to be amended frequently in order to take account of the priorities arising from Commission action and new technical possibilitites appearing on the market it nonetheless seems appropriate to publish each year an up-to-date account of the plan covering the past and the future and containing clear numerical information for the attention of the budgetary authorities, users and data processing staff.

The expenditure forecasts in this document are, of course, given as a guide only and are therefore not binding on the Commission as regards any proposals it may make to the budgetary authorities.

This report discusses the following main topics:

- The plan provides for an average growth of 25 to 30% per annum in the data processing services provided for users. At the same time a two to three-year backlog has to be worked off.

- It is estimated that it will take five years (until 1988), with unchanged resources, to cope with the waiting list for new applications. This time limit must be reduced to three and a half years (until mid-1986) by increasing the funds available.

- Increased administrative efficiency in the Commission depends largely on investment in new information technologies, including in particular electronic office equipment. The work of a growing number of officials will therefore change radically over the next few years. The success of this change will depend upon a major training effort and close cooperation with the staff.

- The Computer Centre expects to raise its capacity tenfold in five years with an almost stationary budget (in constant ECUs).

- An increase of 7 million ECU (17%) (at the constant 1983 rate) in the total data processing budget for 1984 is essential, in particular for the network, electronic office equipment and applications development. This investment would ensure the critical minimum threshold necessary for continued expansion with a stationary budget (in constant ECUs).

- The data transmission network is becoming the essential element in data processing, above all for inter-institutional communication (electronic mail and INSIS).

- The variety and incompatibility of hardware and software available on the market mean that distributed data processing involves difficult and expensive technical solutions, with rigid enforcement of international data processing standards.

- A special effort will be made to improve the quality and reliability of data processing services and to make savings on the basis of cost/benefit analyses.

- The increase in contract-based data processing staff - who are 40% more expensive than internal staff - is making the Commission dangerously dependent in areas where there is inadequate management or control by officials; 20 additional posts would solve the problem.

1. AIMS AND OBJECTIVES

The essential aim of data processing[1] is to use technical progress to improve each year the efficiency of the administration by supplying it with management, communication and information handling tools. The Steering Committee for Data Processing in the Commission (CDIC) realises that there is no greater false economy than trying to economize on productivity, and in order to keep up with demand from the Directorates-General, has set as its goal an average increase of between 25 and 30% per annum in the service available to users, at the cost of a slight increase in data processing expenditure. This trend, indeed, reflects what is happening elsewhere in the world.

Since, moreover, vast sums have been spent in the past on data processing in the Commission for extraordinary measures (merger of the executives in 1967, removal from Brussels to Luxembourg in 1968/1969, seven conversions between 1970 and 1981 for the replacement of the central computers by hardware which was not compatible with the previous machines), a further aim must be set: to improve the situation and work off a two to three-year backlog.

For these reasons the CDIC has drawn up a programme for improvements and development, with a definite timetable and annual objectives:

1981: Rehousing and reorganization of the computer centre in Luxembourg - completion of conversion operations (see Chapter 4);

Drawing up of a medium term policy for distributed data processing (see Chapter 3 and Annex I);

Restructuring of the data processing organization to incorporate telecommunications, electronic office equipment and documentation data bases (see Chapter 2);

Installation of a new telephone network in Brussels to meet the needs of the period 1982-1990.

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1 "Data processing" denotes all information handling activities including office equipment (electronic office equipment) and telecommunications (telematics), which are moving progressively towards the integration of data, text, image and voice.

1982: Progressive establishment of decentralized data processing organizations within the Directorates-General (see Chapter 2);

Development of methods for data processing management (planning, budgets, project management, training);

First medium-term plan for data processing;

Elaboration of a new policy for the acquisition of hardware, software and information services (see Annex II).

The objectives for 1981 and 1982 have been achieved.

1983: Installation of a new data communications network to meet the needs for the period 1984-1990 (see Chapter 6);

Launching of a large number of applications projects (see Chapter 7);

Consultation with staff on the introduction of new techniques into the working environment;

Improvement of data processing capacity (quality, reliability, cost/-benefit analyses, development productivity);

Establishment of a new policy for data base management.

1984-85: Significant progress as regards the integration of electronic office and telematics services at user level;;

First electronic mail service (see Chapter 6);

Implementation of the infrastructure for the years 1986-1990 (see Chapter 8, INSIS);

Development of important inter-institutional applications in association also with the administrations of member countries (see Chapter 8, INSIS).

Thus the aim of providing front-rank data processing services in the Commission should be achieved during the second half of the 1980s.

2. ORGANIZATION, STAFF AND TRAINING

ORGANIZATION

Since the restructuring of the data processing organization at the end of 1981, the committee structure for data processing management has been as follows[1]:

- the Commission's Steering Committee for Data Processing (CDIC) chaired by the Director-General for Personnel and Administration (DG IX), and comprising the Directors-General of DG XIII, the SOEC, DG XVII, a representative of the Secretariat-General, the Deputy Director-General of DG III and the Director of Department A of the JRC in Ispra.

  This committee decides, under the authority of the Commission, the strategy, major policy lines, organization, plans and budgets on the basis of proposals submitted to it by the Director for Informatics.

The CDIC is assisted by two main committees chaired by the Director for Informatics:

- the Users' Committee (CU), comprising representatives from Directorates-General which use the services of the Directorate for Informatics, deals with users' problems, in particular plans, priorities, budgets and projects;

- the Informatics Technology Committee (CTI), is a consultative body which reports to the CDIC and to the standing group for industrial innovation and which consists of the Directors of Department A of the JCR in Ispra, DG III/B and DG XIII/B, and is responsible for making recommendations on technological questions affecting distributed data processing policy.

- the CTI is assisted by the Standard Implementation Committee (SIC), chaired by the Director of Department A of the JRC in Ispra, the role of which is to ensure that norms and standards are properly implemented.

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1 For the list of abbreviations, see Annex IV

- the Staff Committee has set up its own Informatics Sub-committee, which regularly meets the Director for Informatics and his colleagues in order to examine staff problems arising from computerization within the departments.

- In addition to these Commission committees mention should be made of the Inter-Institutional Committee for Informatics (CII) chaired by the Commission's Director for Informatics, which includes representatives from each institution. This committee has drawn up an inter-institutional cooperation programme and has extended its field of interest to the INSIS programme (see Chapter 8).

The Directorate for Informatics (DI) is the pivot of the new data processing organization. It has the following divisions and departments:

- Informatics, Planning and Administration (IPA) is responsible for coordination of plans and budgets, fund management, administrative and contractual aspects of procurement, and secretariat services to the Users' Committee.

- Quality Management and Internal Audit (QA) makes, on the basis of analyses, recommendations aimed at improving the level of data processing services as regards quality, reliability, performance and ergonomics.

- Computer Centre (CC) makes machine time on the central computers available to users and also provides associated services in the field of systems engineering, user support, data management and acquisition - these two activities should be gradually decentralized.

- Integrated Information Systems (SII) is responsible for telecommunications, distributed data processing equipment and electronic office equipment, and access to internal and external data bases. It also provides user support facilities for users in these areas, including the design and management of projects.

- Informatics engineering (II): is responsible for the design and implementation of the infrastructure of the data processing services. It plans for the future and ensures that new technical methods and facilities are introduced.

- Applications Development (DA): is responsible for designing, implementing and maintaining applications developed centrally.

Within the Directorates-General local data processing organization structures have been set up. Their size and tasks vary depending on the degree of computerization within the units of a particular Directorate-General. The Directorates-General have each appointed a director responsible for the organization of data processing, in addition to an information systems manager (ISM) who is responsible for the day to day management of data processing activities within the DG.

These officials form the links at management and operational level between the central organization and the users; they are also members of the Users' Committee which deals with the Directorate-General's data processing problems. The Directorate for Informatics exercises professional control over the staff in the DGs, in particular via directives published in the Informatics Guide (see Annex III).

STAFF

The following table shows the Commission's data processing staff:

TABLE 1: Staff, 1982	LX	BX	TOT
DI/IPA/QA	7	21 (a)	28
CC	88	-	88
SII	27	194 (b)	221
II	28	4	32
DA	41	2	43
Total for Informatics Directorate	191	221	412
Directorates-General	60	71	131
Staff under contract	80	45	125

(a) This figure includes mainly administrative and secretarial staff, in particular IPA staff, responsible for the management and administration of the Informatics Directorate

(b) This figure is high since telecommunications (switchboard and telex), which employs more than 140 persons, is attached to the Informatics Directorate

The annual average increase of 25 to 35% in the volume of services provided by the Informatics Directorate cannot be continued unless the Directorate's staff is increased. Since the requests for extra posts have been regularly turned down in recent years, the data processing plan assumes a rapid increase in the number of staff under contract. At the end of 1982 work done under contract was the equivalent of 125 man/years, 83 of which were spent on permanent tasks. Employment under contract is expensive since it may be estimated that on average a member of staff employed under an external contract costs 40% more than an official with comparable qualifications. Moreover, their number gives cause for concern insofar as it creates a dangerous dependence on outside resources at certain sensitive points of the organization; this applies to 20 man/years.

Within the Directorates-General an increasing number of staff are working either part- or full-time with data processing applications, either as users or as application managers or programmers. The figures for data processing staff within the DGs mentioned in Table 1 do not include:

data or text acquisition staff, since their work is gradually being integrated into other administrative tasks;

users managing the contents of data bases;

officials using computers for their personal calculations (statistics, econometrics etc.). The latter category contains approximately 170 people who spend between 25 and 75% of their time on such tasks.

The development of the use of data processing tools and the increase in electronic office equipment planned for the period 1984-85 will entail major changes in the nature of the work done by staff, which can be achieved only in close cooperation with them.

TRAINING

In this context training is a major prerequisite. To make the DGs more efficient, their data processing competence should be increased and training should be given to a growing number of users whose tasks, formerly purely administrative, will increasingly involve the use of data processing tools (consultation of data bases, updating of files, use of highly developed languages, etc.). At the same time training must also cover information officers, given the speed of technical progress in the field of data processing on the one hand and the need to expand their role within the new organization on the other.

The total figure for Commission internal training in data processing for 1982 may be estimated at just over 3 000 trainee-days. Of particular note were the training of 150 officials in data base interrogation, the training of 130 others in the use of text processing systems, and the courses on computer languages (COBOL, APL, etc.) representing a total of 450 trainee/days. A series of lectures given by the Commission's data processing experts under the general title of 'Pratiques de l'informatique' (Data Processing Practice) gave forty of the Commission's senior staff a better understanding of the potential and probable development of in-house data processing.

It has been made easier for 'professional' computer staff to attend specific training sessions of a more technical nature and to take part in external courses or seminars in order to improve their knowledge and keep them abreast of developments.

However, since the demand is great, a more ambitious training programme must be implemented, and recommendations on the responsibilities, methods and organization of training courses in data processing have been drawn up and distributed.

The expansion in electronic office applications envisaged for the period 1983/85 must be very carefully prepared in accordance with a specific plan for staff training, so that these new techniques can be integrated into the working environment with a minimum of friction.

3. GENERAL GUIDELINES

The general guidelines give the architecture and technical criteria for all data processing hardware and software to be installed between 1983 and 1990; they represent a difficult compromise between contradictory objectives and constraints:

- Distributed data processing

In 1980 the Commission decided to install distributed data processing (see Annex I) with a view, for economic reasons, to the gradual integration of data processing, text processing, image and voice processing services at the level of user access (multifunction work stations) The decreasing cost (approximately 20% per annum) of mini and micro-computers is making it possible to install them close to users. Large-scale computers serving all users are increasingly being used to manage large data bases. Telecommunications networks linking the computers and work stations together and providing remote access to host computers are becoming the essential factor in data processing architecture. An essential condition is the compatibility of all hardware and software irrespective of its origin.

- Comptatibility of equipment

In order to avoid being dependent on a single supplier for all its data processing requirements, the Commission has to insist that hardware from different manufacturers is mutually compatible . Here the Commission faces the same problem as other customers in Europe for whom it wishes to set an example by defining a policy for the acquisition of data processing equipment (see Annex II).

This problem will be solved only by means of internationally respected standards. Existing standards cover only a small percentage of what is needed A theoretical model of categories for standards arranged on different levels has been internationally accepted. This is the Open System Interconnection (OSI) with the following levels: 1. physical, 2. connection, 3. network, 4. transport, 5. session, 6. presentation, 7. application.

For levels 1 to 3 there are international standards theoretically permitting networks to transmit data. But there are no standards for levels 4 to 7 which would make computers and work stations mutually comprehensible, since these protocols exist mostly at software level. Pending an international agreement, the manufacturers, whilst accepting the OSI philosophy, apply their own personal protocols which are mutually incompatible (C.I.I./H.B. : DSA, Digital Equipment : DECNET, I.B.M. : SNA, I.C.L. : IPA, I.T.T. : CNA, SIEMENS : TRANSDATA, UNIVAC : DCA, etc.). In general each manufacturer can therefore sell only within his own architecture, which leads to compartmentalization of the data processing market, which can only be profitable to the manufacturer with the largest share. It would be inconceivable for the Commission, or any other customer, to install a complete distributed hardware network for each manufacturer.

This is the obstacle which is blocking progress and which risks vitiating industrial investment in research. A decision on standards is therefore urgently required for the sake of the European data processing market and industry; if necessary those standards which are already the most widespread could be adopted.

There are some exceptions where standards do exist for levels OSI 4 to 7 (teletype, teletex, videotex, file transfer). But these protocols are still insufficient to underpin development of the Commission's data processing architecture to the extent that the technical possibilities allow.

Technical feasibility

Owing to the lack of standards and to economic difficulties, new products are entering the market more slowly than technological progress would lead one to expect.

For the years 1984-86 efforts should be limited to the integration of texts and data, the setting-up of a digital network in parallel with the analogue telephone network, the implementation of electronic mail (based on Teletex, and on rapid growth and improved quality of telecopying) and the improvement and expansion of present services. Mini-computers will still play an important role but the advent of micro-computer work stations will reduce their value. In the period 1984-86 these overall trends will particularly favour the development of the electronic office.

The years 1986-90 will see the introduction, following pilot schemes in 1984-86, of local applications occupying a wide band width and permitting the integration of a static image and vocal messages, i.e. local networks and optical disc archiving with complete message transfer facilities. It is worth pointing out that the success of new local configurations for 1986 will depend to a large extent on the existence at that date of international standards still under discussion today.

In the meantime teleconference services will be continued - by parallel (telephone, cable, satellite) and modernized (telecopying, fixed image) communications - until such time as it is economically justifiable to introduce video-conference facilities.

The complete integration of communications by an integrated services digital network (ISDN) is not expected in the Commission before 1990.

Multilinguism

The Commission's requirements as regards multilinguism will be met only at the cost of great technical and economic effort, but the resultant benefits are likely to have broad application. The Commission (DG III) is working on the development of a multilingual keyboard.

Synchronization with the INSIS programme (objectives set out in Chapter 8)

INSIS provides for the implementation of advanced technical solutions which will not be easy to reconcile with the need to wait for international standards to be adopted for the selection of hardware and software.

In the light of the above, the architecture may be defined as follows.

The local configurations consisting of computers and work stations close to users will give access to the central data processing services via an institutional (i.e. serving all users in the Commission) packet switching type data network - international standard X25 - similar to the public networks (see Chapter 6, project 1).

In order to prevent manufacturers' protocols from extending to all Commission activities, access to the central services will be limited as far as possible by manufacturer-independent protocols: Teletype and later ECMA videotex for consultation of data bases, NIFTP (Network Independent File Transfer Protocol) and later the ECMA standard for the transfer of files and remote batch processing and Teletex for text communication. Access by any manufacturer's protocol is purely temporary and requires a special authorization. The adaptation of computers to the protocols mentioned above is a costly procedure (see Chapter 6, project 2).

For local communication between work stations and local computers a variety of non-standardized solutions must be used until the standardized local networks are introduced. Manufacturers' protocols will therefore be accepted provided their field of application remains local. In view of the number of Directorates-General requiring a local configuration a competitive balance between manufacturers will probably be possible. As a result, however, these configurations will have to be converted once standardized hardware is available.

In order to reduce local conversion costs the general guidelines set out strict conditions for making the software as independent as possible of the choice of hardware (portability). Whereas in the past the basic software was chosen to suit the computers, greater emphasis will have to be placed in the future on the selection of software, and checks made to ensure that the hardware supports it. A second route to reducing future conversion work is maximum standardization of the human interface: multilingual character sets, keyboards, command languages and ergonomic conditions.

Particular attention will be given to the drawing-up of a new data base management policy - the most important field of application in the Commission (see Chapter 1, Objective 1983).

The general guidelines take the form at the technical level of the definition of infrastructure projects (see Chapter 6), the drawing-up of hardware and software specifications for invitations to tender and instructions for the development of applications covering the Commission's needs (see Chapter 7).

The Standard Implementation Committee will take an increasingly important role in implementing the general guidelines, not only in monitoring the application of existing standards (e.g. certification of magnetic tapes and of the TTY protocol in 1982), but also in the drawing-up of new norms needed for the establishment of the data-processing infrastructure.

4. COMPUTER CENTRES

In 1981 the former Computer Centre in Luxembourg had an overworked ICL 2980 computer and a Siemens 7760 housed in another building plus an ICL 2976 operated by a service bureau.

A new ICL 2982 (dual) computer, the ICL 2976 and Siemens 7760 computers were housed together, in accordance with the objectives originally set, in the computer room at the new Computer Centre under the authority of the Commission's staff, and a new, more efficient method of organization was implemented in the computer room. The ICL 2980 load was distributed in accordance with rational criteria between those computers by means of a major conversion operation which it is confidently hoped will be the last in a series which paralysed data processing in the Commission.

The availability of services has gradually improved, with the mean monthly rate of availability increasing from 91% at the end of 1980 to 97% at the beginning of 1983 (Table 2, line 4).

Computing capacity has increased considerably - from 4.4 mips to 7.5 mips (Table 2, line 1) in one year, representing a rise of 70%; the storage capacity expanded by 88% over the same period. These high rates of growth were due to a starting level which was unusually low for an organization the size of the Commission. Moreover, they only just made it possible to satisfy the increase in demand, since at the end of the year there was no reserve capacity available on the second Siemens (7551) computer installed in May 1982.

This rapid increase in requirements is not something peculiar to the Commission. There is generally an annual increase of computer configurations of approximately 50% in large-scale public or private organizations.
The rates of increase are due in particular to the installation of data base management systems which, although they are very satisfactory from the users' point of view, take up a great deal of machine capacity.

In order to offer a high-quality service during the day the size of computer configurations will in future depend only on the volume of jobs in interactive mode, since the capacity available will make it possible to absorb batch processing also. Consequently, Table 3 does not take account of batch processing, even where there is a high proportion of it, since it is no longer representative of the workload. The increase in computing capacity with a view to eliminating night work is, moreover, becoming an economically viable operation (Table 2, lines 5 and 8 for 1984).

Table 3 shows the details of trends in resources by type of application (upper part) and by user (lower part). The units of measurement are the capacity used expressed in GINS per annum (giga instructions) over the interactive period and also the magnetic disc storage volume expressed in megabytes per annum. The use of external resources (service bureaux) is included in these figures, except for the last three lines which concern only the Commission's Computer Centre (development and maintenance, running, reserve capacity and total net capacity).

Statistical, documentation and administrative systems use most resources, but it is interesting to note that the highest rate of increase is to be found under the heading "other Directorates-General", which indicates a gradual general spread in the use of data processing.

In future, despite a significant annual increase in configuration capacity, costs are likely to increase only slightly, expressed in millions of constant ECUs, owing to a marked improvement in the cost/benefit ratio of equipment. This objective can, of course, be achieved only by virtually continuous negotiations with manufacturers within the contents of existing contracts. Moreover, if account is taken of the reduction in staff, both internal (Table 2, line 6) and external (Table 2, line 7), the total cost for the Computer Centre should decrease slightly and the cost per unit of capacity to be supplied by the Computer Centre by the end of 1983 (including all machinery and having regard to staff costs) should represent less than 50% of the unit cost of capacity acquired from outside.

The inadequacy of the configurations at the Commission's own Computer Centre led to growing use of external service bureaux: the CII/HB EURIS centre for documentation bases, and the IBM service bureau mainly for applications for the Directorate-General for Economic and Financial Affairs. The gross computing capacity used increased by 50% between 1981 and 1982 (Table 2, line 10), with the available storage volume climbing by 43% (Table 2, line 11) and the number of simultaneous accessing operations by 24% (line 12). The expenditure on these external "service bureaux" (line 13) increased by 30% over the same period.

A cost-cutting exercise has been launched with a view to limiting the increase in such expenditure. It is estimated that an overall saving of 1.5 million ECUs might be achieved over the full year by the procurement of a computer. However, since such equipment cannot arrive before the end of 1983 the effect on expenditure relating to external centres will scarcely be felt until 1984.

For the years 1985 and 1986, when the existing contracts will expire, consideration will have to be given to replacing the computers in service. The principles set out in the policy for acquiring computer hardware and software (see Annex II) must be applied to this operation.

The Computer Centre's priorities for the immediate future, (1983), are as follows:

- Reorganization and improvement of the direct service to users;

- Critical review of management and data-capture tasks in the context of distributed data processing; drawing-up and implementation of a specific plan for the decentralization of management and data-capture tasks to the users concerned;

- Further improvement in the cost/benefit ratio of Computer Centre equipment for the reasons set out above;

- Elimination of the third shift (night work) in order to finance the growth in computing capacity and in the availability of the Centre during productive hours for its user population;

- Critical review of information storage and archiving methods, in particular for the tape library;

- Standardization of contractual and technical relations with external service bureaux.

TABLE 2 COMPUTER CENTRES	Unit (a)	80	81	82	83	84	85
INTERNAL (Luxembourg)							
1. Computing capacity	MIPS(b)	3	4.4	7.5	15	22	30
2. Storage volume	Gb (c)	10.6	18.7	35.1	55	80	110
3. Simultaneous users	Number	45	150	170	217	280	358
4. Computer availability	%	91	95	97	97.5	98	98.5
5. Expenditure on equipment (Item 210)	million ECU(d)	(e)	(f)6.0	9.3	9.7	9.4	9.4
6. Commission staff	Number	108	92	88	86	86	86
7. Staff under contract	Number	60	53	50	36	32	28
8. Expenditure on staff under contract (Item 212)	million ECU(d)	(e)	2.8	2.7	1.8	1.6	1.4
EXTERNAL (Service Bureaux)							
9. Number of centres	Number	9	9	9	9	2	2
10. Computing capacity	MIPS(b)	1.6	2.1	3.1	4.1	1.6	1.6
11. Storage capacity	Gb(c)	3.0	3.5	5.0	5.0	3.3	3.5
12. Simultaneous users	Number	47	62	77	80	72	72
13. Operating expenditure (Item 213)	million ECU(d)	(e)	2.9	3.8	4.0	3.1	2.9
14. Total INTERNAL + EXTERNAL expenditure (Items 210, 212 and 213)	million ECU(d)	(e)	11.7 (f)	15.8	15.5	14.1	13.7

(a) Apart from expenditure, these figures reflect the situation as at 31 December

(b) MIPS = million instructions per second. For the service bureaux machine time purchased is expressed in equivalent computing capacity

(c) Gb = Gigabyte = one thousand million characters

(d) Current prices for 1981, 1982 and 1983. Constant (1983) prices for 1984 and 1985

(e) The budgetary nomenclature had a different definition

(f) The ICL 2976 contract provided for free rental for the first year of operation

TABLE 3	Capacity used (GINS/year) (a)				Storage volume (Mb-years) (b)			
USE OF THE COMPUTER CENTRES	82	83	84	85	82	83	84	85
BY APPLICATION								
Administrative systems	1175	2010	3110	4520	3380	5410	7505	9540
Financial systems	200	280	420	630	238	350	400	500
Statistical systems	2238	2970	5145	7800	12376	16250	24545	36750
Documentation systems	1814	2195	3095	4550	3772	5320	6595	7960
Monitoring systems	309	740	1080	1600	1733	2310	3900	5550
Models	1407	1860	2515	3460	1629	1930	2370	2930
Other applications	41	80	240	450	245	270	325	380
Development and maintenance	3230	3900	4700	5600	5726	6000	6300	6600
Computer operation	2183	2400	2600	2900	1215	1300	1400	1500
Reserve capacity	2698	4130	9940	10840	1415	8860	14205	12150
Total net capacity	13245	17760	30300	38400	28600	44000	64000	80000
BY USER (c)								
SCIC	243	250	20	20	324	350	400	500
SOEC	2112	2800	4425	6650	12189	16000	24190	36250
CUS	126	140	180	250	279	310	400	550
DG II	959	1350	1965	2860	1518	1780	2200	2730
DG III	183	600	900	1350	1454	1000	1500	2000
DG IV	56	100	200	300	5	10	20	30
DG VI	188	300	970	1450	586	900	1885	3110
DG IX	792	1200	1600	2100	2953	4400	5000	5500
DG XI	69	90	110	150	161	200	230	260
DG XII	448	500	550	600	111	150	170	200
DG XIII	448	500	550	600	642	700	750	800
DG XVI	57	80	610	1000	26	50	125	240
DG XVII	132	160	320	650	33	50	500	700
DG XVIII	200	280	420	630	238	350	400	500
Other DGs	25	50	200	400	229	250	300	350
Use by all DGs	1146	1725	2585	4000	2625	5340	7570	9890
Development and maintenance	3230	3900	4700	5600	5726	6000	6300	6600
Computer operation	2183	2400	2600	2900	1215	1300	1400	1500
Reserve capacity	2698	4130	9940	10840	1415	8860	14205	12150
Total net capacity	13425	17760	30300	38400	28600	44000	64000	80000

(a) Giga instructions per year in interactive mode

(b) Mb-years = 1 million characters stored over a year

(c) For abbreviations see Annex IV

5. INTEGRATED INFORMATION SYSTEMS

It followed from the Commission decision directing its departments towards "the integration of data processing equipment, electronic office equipment and telecommunications" (see Annex I) that an appropriate administrative structure should be created - the Integrated Information Systems Division (SII), which was to be set up gradually. At the beginning of 1982 this consisted of the following four sectors: telecommunications (telephone, telex); distributed equipment (electronic office equipment and connected networks by spring 1982); internal data bases other than those managed directly by the departments (ECO 1, ACTU and CELEX); and the "New projects" team. At the beginning of 1983 a fifth "Data information service" team was set up.

As a result of the increase in distributed equipment (between 1982 and 1983 the number of mini-computers will increase from 14 to 20 and the number of non-intelligent terminals from 459 to 628), and of escalating user demand in the field of data bases, a great many qualified staff are required in the SII division to meet the increased work involved in user support, technical back-up and training.

To ensure efficiency and keep costs down decentralized expansion of this kind must, of course, be kept under control. This is the aim of the new organization as regards both coordination and the determination of responsibilities at DG level.

In particular, the local data processing units should organize themselves so that they gradually assume responsibility, with their own resources, for the production work on the available equipment and also for the day-to-day data acquisition and operational management tasks inherent in their data processing applications.

A useful example is the organization which DG II (Economic and Financial Affairs) has long had for the utilization of data processing techniques in the processing of economic and monetary statistics, particularly for the preparation of models. Another instance is the Statistical Office of the European Communities, which alone uses almost half the total net Computer Centre storage capacity (see Table 3).

In general terms considerable progress was made in 1982 in DG IX (Personnel and Administration) and in DG XII (Science, Research and Development) which, like DG XVII (Energy), has an advantage in this respect in having staff with a scientific and technical training. DG XVII has, moreover, set up an autonomous data processing organization with its own data processing equipment specifically for the Fissile Materials Accounting application. The equipment became operational in 1982 and permits exacting conditions of confidentiality to be met.

The Office for Official Publications of the European Communities has taken various steps to computerize its work, and is making increasing use of data processing; DG XIV (Fisheries) and DG XVI (Regional Policy), like the CUS (Customs Union Service) and DG III (Internal Market and Industrial Affairs) have continued to develop projects in hand for several years.

DISTRIBUTED DATA PROCESSING EQUIPMENT

Table 4 gives a general view of trends in distributed data processing equipment for either data processing or electronic office purposes. It highlights also the current great variety in equipment, the extra costs involved as a consequence and the importance of technical and economic rationalization by the introduction in the future of multi-function stations. Column 2 of the table shows that the current budgetary nomenclature is no longer suitable and should be adapted.

An analysis of the figures makes it possible to set out three categories based on the rate of development in equipment stocks:

a) Equipment with a low rate of growth (between 3% and 5% per annum); this is traditional electronic office equipment (typewriters, office calculators, microfiche readers, photocopiers, etc.). The most important factor in respect of this equipment, which is already fairly widespread, is the need to determine the replacement rate for stocks, which depends essentially on an age pyramid which is in fact irregular as a consequence of variations in the amounts of equipment purchased previously.

b) Equipment with a medium rate of growth (between 20% and 30% per annum): this is data processing hardware and in particular non-intelligent terminals and remote job entry terminals (RJE). Placement has not yet reached its limit and the current rate of growth should remain constant until 1985. They are then likely to be replaced progressively by integrated function work stations (micro-computers with text processing + teletex + network interface functions).

c) Equipment with a high rate of growth (between 70% and 100% per annum): in this category are micro-computers, text processing stations and "group III", telecopiers, with teletex stations appearing in 1984/85. This equipment is rapidly evolving into the integrated work station, which will become the work station (terminal) of the future. The introduction of this equipment (for example, word processors) will affect a large number of staff who, in most cases, have not previously come in contact with data processing equipment. Two conditions for the success of this operation will therefore be training and user support facilities. However, the availability of human and budgetary resources is an essential prerequisite for the implementation of a suitable training programme without which economic, administrative and, indeed, human setbacks are likely.

TELECOMMUNICATIONS

The telephone network has been developed in Luxembourg and Brussels to cope with increasing traffic (6.6 million incoming calls in 1982 and 8 million estimated for 1983); this growth has been due in particular to the expansion of the data processing services (telecopying, facsimile, etc.). A new high capacity (20 000 lines) automatic telephone exchange offering various facilities to users was installed in Brussels at the end of 1981. Capacity was also increased in Luxembourg.

The telex network is still developing, but more slowly (191 lines in 1982 and 194 planned for 1983). This is the forerunner of an electronic mail system based on the data network.

The rate of growth of the data network is determined by the number of terminals connected to the network - i.e. between 20% and 30% per annum.

In 1983 the standard X25 network will come into operation (see 6 - Infrastructure development), which will make it possible in the medium term to integrate the data network, telematics and electronic mail systems. Such integration, plus the development of electronic office equipment, will require staff for the installation and maintenance of equipment, and guidance and training of users.

DATA BASES

User demand in this sector is particularly high, and Table 6 shows a significant planned increase in volume of data bases in the next few years. The number of consultations of both internal and external bases is also increasing rapidly. For this reason one of the major objectives for 1983 is to establish a new data base management policy (see Chapter 1).

At the organizational level a particular user support structure has been available for several years. Each Directorate-General has one or more "information officers" on its staff to help officials find information. Moreover, a "data information service" was set up on a central basis from the beginning of 1983 for the express purpose of matching user demand for information to the supply available from all the data base managers.

The quality of the information stored in these data bases, and consequently the quality of the services offered, depends to a large extent on suitable methods of feeding data in, and a particular effort has been made to improve the organization in this area.

Software was devised in 1982 to run the English and German versions of the CELEX legislation data base on the public network. Important budgetary decisions still remain to be taken if multilinguism is to be assured and coverage given to the fields announced when the base was launched.

In 1982 the CRONOS data base (see Table 6) was enriched by raising the number of statistical series in it from 1 million to 1.4 million. This increase, of course, has brought with it certain problems of information quality and reliability of input. These difficulties particularly merit attention since the base will henceforward be accessible to outside users. Internal requests to consult CRONOS and other statistical data bases have also increased and the Brussels "data shop" has had to extend its assistance service to answer specific questions from users in the Commission and other institutions.

The feeding of data into bases such as IFC or CERES (see Chapter 7 - Applications development) required greater cooperation between numerous departments in 1982. The preparatory work done for the opening of the SESAME data base in 1983 meant that DG XII and DG XVII had to cooperate closely to produce a joint data base.

The largest and oldest internal documentation data base, ECO 1, is being re-examined. The distributed method of inputting information in almost all the Directorates-General has in fact tended to reduce the quality and completeness of information in certain fields. For this reason a critical assessment of resources, methods and objectives was undertaken at the end of 1982.

TABLE 4 HARDWARE DISTRIBUTED	Budget Art.	Quantity 82	83	84	85	1983 exp. ('000 ECU) P	R	M	T	Exp. 82
1 Typewriter	220	4935	5090	5090	5090	398	-	178	576	507
2 Office calculator	220	2206	2266	2366	2486	31	-	37	68	45
3 Non-intelligent	211	459	628	738	870	524	633	470	1627	1053
terminal	222	22	24	26	30	2	-	6	8	6
4 Microcomputer work station	211	2	10	56	120	89	-	22	111	14
5 Word processor work station	222	198	349	449	549	60	627	194	881	1056
6 Telex	231	98	88	85	65	-	192	-	192	170
7 Teletext	-	-	-	-	20	70	-	-	-	-
8 Coding workstation	211	30	30	30	28	-	233	-	222	2229
Microfiche reader	220	158	176	201	226	50	-	9	59	47
10 Telecopier	222	56	96	116	146	-	185	-	185	117
11 Photocopier	222	256	262	272	282	60	700	100	860	902
12 Desktop printer	211	207	290	350	400	95	44	53	192	137
	222	60	110	110	120	-	-	30	30	25
13 High speed printer	211	4	6	6	7	-	49	-	49	32
	222	1	1	1	1	-	25	-	25	25
14 Teleconference studios	231	2	4	6	6	3	21	-	24	12
15 RJE terminal	211	26	30	32	34	-	274	-	274	240
16 Minicomputer	211	14	20	22	24	-	1221	-	1221	771
	222	6	8	9	11	-	606	-	606	509
17 Software	211	-	-	-	-	-	-	-	273	112
18 Supplies and removals	211-	-	-	-	-	-	-	-	281	139
19 Special equipment	222	-	-	-	-	400	356	147	903	900
	211-	-	-	-	-	-	-	-	899	574
20 Other	220					31	-	16	47	53
	211					44	-	18	62	28
21 Price indexation						-	-	-	100	-

		82	83	84	85					
Expenditure ('000 ECU)	211	3322	5311	5575	6635	752	2454	541	5311	3322
	220	650	750	845	1100	510	-	240	750	650
	222	3540	3538	4875	5030	522	2499	477	3538	3540
	231	182	216	230	250	3	213	-	216	182

P = Purchase

M = Maintenance

R = Rental, including maintenance

T = Total

TABLE 5 TELECOMMUNICATIONS	Unit	1982	1983	1984	1985
TELEPHONE NETWORK					
1 Internal lines	Number	11 000	13 000	14 000	15 000
2 External lines	Number	922	1 012	1 072	1 112
3 Internal telephone calls	Million	18	20	24	30
4 Incoming calls	Million	6.6	8	10	14
5 Outgoing calls	Million	11	13	15	18
6 Expenditure on PTT services (Article 231)	mECU	5 613	5 644	5 780	6 190
7 Expenditure on equipment (Article 232)	mECU	192	180	190	200
TELEX NETWORK					
8 Lines	Number	191	194	207	198
9 Expenditure on services (Article 231)	mECU	1 760	1 800	1 900	2 000
DATA TRANSMISSION NETWORK					
10 External lines	Number	18	22	24	26
11 External traffic (a)	Kb/s	173	240	288	317
12 Internal lines 1 200 b/s	Number	238	290	350	440
13 2 400 b/s	Number	90	90	100	110
14 4 800 b/s	Number	49	70	85	100
15 9 600 b/s	Number	130	150	180	210
16 48 000 b/s					
17 Internal traffic (a)	Kb/s	1 984	2 340	2 796	3 252
18 Expenditure on PTT services (Article 211)	mECU	318	435	537	627
19 Expenditure on equipment (Article 211)	mECU	740	1 196	2 812	2 158
20 Expenditure on equipment (Article 212)	mECU	18	32	35	40
Total expenditure: Article 211	mECU	1 058	1 631	3 355	2 785
Article 221	mECU	210	212	225	240
Article 231	mECU	7 373	7 444	7 680	8 190

mECU = '000 ECU

(a) expressed in millions of bits (1 bit being the basic unit of data, equal to 0 or 1

TABLE 6 PRINCIPAL INTERNAL DATA BASES	Volume (MB)			
	1982	1983	1984	1985
Personnel management system (SYSPER)	560	560	560	560
Automatic address and publications management system (SAGAP)	225	230	240	250
Credit and Investments accounting (CRIMSON)	120	180	250	300
Chronological statistical series (CRONOS)	1800	2400	2400	2400
External trade (SIENA)	700	1500	2500	3000
Access system for the European nomenclatures data bank	780	940	1100	1420
Institutions legal documentation (CELEX)	700	1180	1300	1450
Internal Commission documentation (ECO1)	620	700	750	850
Terminology data bank (EURODICAUTOM)	160	200	240	280
Community financial instruments (IFC)	75	85	95	105
Application of Directives monitoring (ASMODEE)	50	55	60	65
Automatic library catalogue (ECLAS)	50	70	80	90
Micro-economic documentation (DOME)	30	39	51	66
Textiles monitoring	50	400	400	450
Steel monitoring	40	190	350	410
Other operational documentary bases and auxiliary development files (ACTU, PRC, etc)	970	1185	1065	1130
Total	6930	9914	11441	12826
Data bases under development	100	840	3135	4260
Grand total	7030	10754	14576	17086
Appropriations for external bases (mECU)	0.144	0.210	0.450	0.450
Appropriations for document analysis (mECU)	0.733	0.795	0.850	0.850

6. INFRASTRUCTURE DEVELOPMENT

Data processing infrastructure projects must be in accord with the general guidelines (Chapter 3) and respect the priorities set out in the objectives (Chapter 1).

The replacement of the current primitive data network by a modern network capable of interlinking the various computers, terminals and office work stations and of connecting them to public networks is a first step in this direction (Table 1, project 1). The network will be based on the X.25 standard used previously for Euronet and adopted by all European postal administrations for their data networks.

The interconnection of heterogeneous hardware from the European market will require numerous studies, modifications to software, testing and approval procedures for the application of standards and protocols agreed at world level (ISO, CCITT), European level (ECMA, CEPT) and internally (project 2). An initial priority is the transfer of files between computers made by different manufacturers.

The development of an electronic mail system (INSEM) using the data network will make it possible not only to speed up and simplify the circulation of the institutions' documents, but also to make significant savings on resources by avoiding successive retranscriptions (project 3 associated with the INSIS programme).

Electronic mail will, however, come into its own only once it is served by a suitably integrated extension of the work stations, which are unable at present to exchange information.

A first stage covering the integration of text and data into and between local hardware configurations, including modifications to suit standardized protocols, is planned for completion in 1984 (project 4). This project is essential to any significant progress in the development of the electronic office from 1984 (see Chapter 1).

A second stage, for which preparations began in 1983 and which is to be completed in 1986, will cover, in addition to text and data, the integration of documents in graphics mode (logos, facsimiles), the development of local networks and electronic archiving (project 5).

The various tasks involved in the integration of new technologies will be based on studies and tests carried out within the context of INSIS for the purpose of ensuring that the system is introduced in the period 1986-1990 (see Chapter 8) under reliable operating conditions and with a sound knowledge of the European market.

The statistical software currently in use for input and consultation of large-scale statistical data bases on the European economy must be consolidated in order to cope with the considerable increase in the amount of data stored (project 7). This software is, however, insufficient to cover the data needs of economic analysis and monitoring, and should be complemented by new developments, in particular for indexing data, supporting large-scale structural files and taking account of new distributed equipment (project 8).

The increasing use of data base management systems as information support in the various fields of the Commission's work requires technical facilities capable also of performing exchanges between data bases and adapting them to developments in work stations (9).

Applications development (analysis and programming) is certainly a critical factor in data processing development, both in view of its increasing relative cost and the slowdown effect of the long development times. An increase in productivity in this field will require a great effort, given the variety of equipment available, and will necessitate suitable programming and documentation tools.

Finally, faced with the complex trends in requirements and technology, the development of the various branches of data processing must be studied, planned and managed as a whole in order to achieve a better cost/benefit ratio. Moreover, a team of experts must be permanently available to assist and train data officers in the DGs and the central services (11).

TABLE 7 INFRASTRUCTURE DEVELOPMENT	In-house staff man / years				Contract staff man / years			
	82	83	84	85	82	83	84	85
1. Data networks	1.0	1.5	1.0	-	0.6	1.05	0.45	-
2. Equipment compatibility	1.2	1.2	1.0	1.0	0.45	1.96	3.90	3.00
3. Interinstitutional electronic mail (INSEM) (a)	-	1.4	2.0	3.0	-	1.05	10.07	12.92
4. Local configurations 84	6.1	4.5	4.0	-	0.6	4.05	7.96	-
5. Local configurations 86	-	0.2	2.0	7.0	-	0.60	3.15	6.01
6. INSIS experimental work (a)	2.3	5.8	4.0	2.0	-	-	-	-
7. Consolidation of statistics software	5.0	5.5	2.0	1.0	3.15	9.32	8.27	3.15
8. New statistics software	2.0	1.5	5.0	6.0	1.58	2.10	3.15	8.71
9. Data base support	4.5	4.5	4.5	4.5	0.90	2.70	2.10	5.26
10. Appl. Dev. productivity	2.5	2.7	3.0	3.0	1.05	3.00	4.50	4.50
11. General guidelines, studies, training, management, technical assistance	7.4	5.2	5.5	6.5	-	1.20	1.50	1.50
Totals	32.0	34.0	34.0	34.0	8.33	27.03	45.05	45.05
Expenditure (in '000 ECU) on contract staff and services - Article 214 (0.066 mECU per man/ year)					555	1800	3000	3000

(a) Contibution to INSIS programme

7. APPLICATIONS DEVELOPMENT

With no change in resources, the waiting period for new applications would be around five years, which would mean that no additional requests could be taken into consideration until 1988. Since this is unacceptable, the plan provides for a significant increase in external staff in order to reduce the delay to three and a half years (i.e. mid-1986 - see Tables 8 and 9).

The Directorates-General are expected, within the context of distributed data processing, to take increasing responsibility for the development of applications specific to their work. Certain DGs have set up local data processing structures which enable them to devise their own applications or to engage external teams to develop local projects. Special mention may be made of the following services: the SOEC, the Office for Official Publications, DGs II, VI, VII, XIV, XVII and the CUS (for the abbreviations see Annex IV). A rough estimate is that the DGs are currently expending 55 man-years on internal projects for applications development.

The department for applications development, which is responsible for devising inter-institutional applications or applications relevant to several Directorates-General, and the team from the SII division responsible for project design and management, are cooperating centrally in this effort.

Once they had successfully completed the applications conversion and transfer project described in Chapter 4, the services turned their attention to the development activities set out in Table 8. This table constitutes a balance sheet for the past year, a work plan for the current year, 1983, and a workload forecast for future years for the applications recorded in February 1983.

Among the new administration and staff management systems the rapid implementation of the MINI-SYSPER data base is worthy of note. With this the administrative departments responsible for staff management can quickly obtain the statistical or other specific information which they need to make their decisions. In the same way the SYSPER system, which is currently being developed, will give easy and rapid access to current and background information on posts. Decisions regarding staff management will be recorded, and many standard documents will be computerized, as will standard letters.

The SAFIR project is used to allocate interpreters to meetings. The Commission at present employs 400 established interpreters and may call upon approximately 1 200 freelance interpreters. In 1982 the allocation calculations were made for 8 100 meetings. The allocation of so many interpreters to meetings - the highest in the world - involves an operational search application which could not be carried out manually. In its present provisional state the system is already providing a useful service.

The monitoring of production and supply quotas for iron and steel products, as decided by the Council under Article 58 of the ECSC Treaty, has been continued and extended by the installation of a data base. Applications for the limitation of exports to the USA and the monitoring of steel trade within the Community are being prepared.

Development projects in the field of financial instruments have continued in several sectors, in particular the Regional Fund and the Social Fund, and within the Directorate-General for Credit and Investments.

As for statistical surveys, the salaries survey and the steel structure survey have been completed, and the development of the fishing accidents survey and the transport situation survey has begun.

The TARIC data base is designed to manage the integrated Community customs tariff set up within the context of the Customs Union.

The TEXTILES data base combines information on external trade in textiles and the management and analysis software used during the multifibre agreement negotiations.

The SIENA data base combines all information on external trade since 1976 and statistics processing software.

Within the external trade statistics sectors GTP statistics for import controls under the new Generalized Preferences system have been prepared, as have ACP statistics for which data provided by the United Nations Statistical Office are fed into the CRONOS data base.

Within the field of documentation applications, two developments which took place in 1982 should be mentioned:

reorganization of the CELEX data base for Community law and its extension beyond the parent French-language base to cover English and German;

the opening of two new data bases - the Community financial instruments data base (IFC), which provides information on the regional effect of financial instruments, and the surveys procedure management base (CERES), which covers events from the introduction of the request to submission of the final report.

For 1983 there are plans to open, within the context of the "documentation and information" data base (CEDIN), at least 2 satellite files.

In addition, a data base on demonstration projects for new energy forms (SESAME) will be opened, together with a management application concerning replies to parliamentary questions (ROGER).

It has been possible to convert DG XVII's "Fissile Materials Accounting" application (see Annex IV), previously run by a service bureau, to operation on a computer installed in 1982 which is operated directly by DG XVII staff.

The SAGAP system, which manages and addresses publications at the Publications Office, is to be transferred from the present computer, which has become too small, to a new computer capable of absorbing the future requirements of the Publications Office and suitable for integration into the Commission's data network. The expansion of the business management applications (recording of orders, invoices and accounting data) will continue on the new equipment.

Requests for new applications (see Table 9) from the Commission's departments are rapidly increasing. They frequently concern the setting up of information systems designed to assist the Commission in its tasks: surveillance systems, monitoring of the implementation of treaties and directives, fund management, back-up for statistical systems in the field of external trade. Problems of coordination are encountered during the development of such applications, either within a particular department or between departments with similar problems. The Directorate for Informatics therefore wants to see interdepartmental groups set up to coordinate scattered requests and to save resources, while at the same time respecting the responsibilities conferred by the Commission on the departments concerned. Moreover, the requesting departments must formally undertake to assume complete responsibility for the day-to-day management of an application once it becomes operational.

Among the new projects shown in Table 8 together with the estimated cost of development for the period 1983-1985, some are politically extremely important: extension of surveillance in the steel sector after June 1983, the management of state aids, fund management, the management and detection of irregularities and fraudulent practices detrimental to the Commission and energy data management. Detailed rules have been approved by the CDIC to decide the degree of priority for new applications (see Annex III). The most important criteria are contribution to meeting the Commission's objectives, a positive cost/benefit ratio and a level of preparation adequate to guarantee the success of a project.

Various projects listed in the upper part of Table 9 can be gradually developed between now and the end of 1985 on the basis of current budgetary allocations and present known demand. The lower part of the table shows the resources available between now and the end of 1985 and the deficit, expressed in man years, in accordance with the plans. This deficit could be absorbed during 1986, if no new demand arises between now and then, which seems highly unlikely. We can therefore conclude that our "order book" is full until 1986.

The applications development services try to follow developments in data processing technology. Within this context the applications make increasing use of data bases and of instant visual display equipment, which thus allows a man-machine dialogue. The quality of the service provided for users is thus improved. Further progress has been made in this direction by the use of data base interrogation languages which are relatively accessible to users.

The implementation of general data base software which meets the previous criterion has also made it possible to increase development productivity. The services intend to continue their work in this area and to continue to look for software tools suitable for increasing productivity. However, the variety of sources of data processing equipment does not make the task easy and tends to put up costs.

TABLE 8 APPLICATIONS DEVELOPMENT	In-house staff man / years				Contract staff man / years			
	82	83	84	85	82	83	84	85
MAINTENANCE, IMPROVEMENTS AND GENERAL SUPPORT								
Administrative systems	17.13	13.24	13.00	12.66	8.44	8.33	8.36	5.66
Financial systems	4.05	5.56	4.81	5.23	2.67	6.97	7.19	7.0
Statistical systems	6.52	2.35	2.74	4.13	3.74	5.63	5.76	5.60
Documentation systems	2.10	1.50	1.50	1.00	3.18	3.15	3.12	3.00
Monitoring systems	6.39	5.19	3.56	0.55	4.78	4.52	4.58	4.58
Totals	36.19	27.84	25.61	23.57	22.81	28.60	29.01	25.92
CURRENT PROJECTS								
Parliamentary questions (ROGER) (Inter-inst)	0.10	0.20	-	-	0.26	0.15	0.08	0.06
Directives base (ASMODEE II) (SG, general)	-	0.50	-	-	-	0.36	-	-
Publicly-available legal documentation (CELEX) (Inter-institutional)	1.00	1.00	-	-	2.25	3.03	1.11	1.26
Statistical surveys (SOEC, DGs VII, XI, XVII) Multiannual	0.81	1.73	0.94	-	0.92	2.43	4.43	3.09
External trade statistics and GATT negotiations (SOEC, DG I)	-	-	-	-	1.76	3.00	3.00	4.50
External trade data base (SIENA) (SOEC)	-	-	-	-	-	2.01	3.00	2.01
CCT management (TARIC II) (CUS)	-	-	-	-	0.56	2.51	1.76	-
Interpreters management (SAFIR) (JCIS)	1.08	0.75	0.67	0.95	6.66	9.01	9.67	3.33
Steel monitoring (DG III)	1.89	3.83	0.20	0.20	1.16	3.11	-	-
Textile monitoring (DG III)	1.89	0.90	-	-	1.20	3.32	1.94	-
Social Fund (Phase I) (DG V)	0.14	0.22	0.27	0.27	0.60	0.87	-	-
EAGGF - Guidance (DG VI)	0.54	-	-	-	1.43	1.62	0.35	-
Third countries development fund management (PICS) (DG VIII)	-	-	-	-	0.32	2.79	3.00	1.00
Fo aid programme management (DG VIII)	-	-	-	-	0.06	1.61	-	-
Personnel management (SYSPER) (DG IX)	1.34	3.30	3.81	6.05	4.70	2.01	4.68	4.85
Contract management (DIODON II, PROMAN) (DGs XII, XVII)	-	-	-	-	0.16	0.75	-	-
ERDF (Phase I) (DG XVI)	0.27	0.45	0.27	0.13	0.96	1.74	-	-
Energy and research documentation (SESAME) (DG XVII)	0.20	0.20	-	-	0.27	0.17	0.08	0.06
Credit and Investments accounting (CRIMSON) (DG XVIII)	0.95	1.68	0.94	0.67	1.82	1.41	0.86	0.86
Budget library (DG XIX)	0.60	0.60	-	-	-	0.58	-	-
Totals	10.81	15.36	7.10	8.27	25.09	42.48	33.96	21.02
RESOURCES FOR NEW PROJECTS	-	3.80	14.29	15.16	-	9.33	47.47	65.67
Grand totals	47.00	47.00	47.00	47.00	47.90	80.41	110.44	112.61
Expenditure on personnel and services (Article 214 (in '000 ECU)					3190	5355	7355	7500

(a) Staff from the various DGs are not included, since the organization set up in 1982 has not yet had time to evaluate development and identify all data processing activities in the DGs. The total effort is estimated at 55 man/years.

TABLE 9 NEW PROJECTS	Estimated development effort required in man / years
Management and detection of irregularities and fraud relating to Community regulations (DGs III, VI, XIX, XX; CUS and SG)	11.6
Management of infringements (SG, DGs III and VI)	3.0
Management of State aids (DGs IV, VI, XIV, XVII, SG) The number of State aids subject to Commission approval has now increased beyond the point where manual data management is possible	11.6
Credit management (CUC) (DGs XIX, XX, and general use) Modernization of credit management procedures	9.7
Community Law data base (CELEX) (general use) (consolidation of the present system)	6.0
Data base covering the information published by the European institutions and information published about the institutions (CEDIN) (Inter-institutional)	5.76
Energy data base (SIRENE) (DGs VI, XVII, SOEC)	12.0
Steel monitoring (DG III) Changes to the monitoring system following policy decisions taken from June 1983 onwards	9.4
Foreign trade statistics submitted by Member States	5.9
Social Fund management (Phase 2) (DG V) Development of the existing application	6.3
Regional Development Fund (Phase 2) (ERDF) (DG XVI) Development of the existing application	4.3
SIPA (DG IX Informatics) Integrated planning and administration system	6.0
New Pay (DG IX) Redesign of a system which is now too old to guarantee satisfactory reliability and normal running	10.3
EAGGF - Fisheries (DGs VI and XIV) Reconstruction of the existing application	3.0
Missions management (TAMIS 2) (DG IX) Reconstruction and modernization of an old application	6.8
Reconstruction and extension of agricultual accounting (RICA) (DG VI)	11.7
Bank funds management (Crimson trésorerie) (DG XVIII)	7.7
Staff regulations reference library (DGs IX, XX)	3.0
New documentation and management bases	15.0
Applications to be developed by DGs (several DGs)	30.0
TOTAL	179.0
Resources available until end 1985 (see Table 8) (in-house and outside staff)	155.0
Deficit for period 1983-1985	24.0

8. INTER-INSTITUTIONAL COOPERATION AND INSIS

At the instigation of the heads of administration in the various institutions, an Interinstitutional Informatics Committee (CII) has been set up to coordinate computerized projects in the different institutions and to make optimum use of the resources available.

In 1982 the institutions adopted a cooperation protocol consisting of three reciprocal undertakings regarding:

the transmission for information of any decision of significance from the interinstitutional point of view;

proposals for interinstitutional recommendations: once the CII has given a favourable opinion, the institution's representative on the committee seeks to obtain agreement at the appropriate level in his institution (8 recommendations in 1982);

the systematic distribution of any comprehensive document concerning the organization, activities or availability of data processing services in addition to any document dealing with interinstitutional recommendations.

One of the objectives at which these recommendations aim is the standardization of methods and the selection of hardware and software, more particularly for invitations to tender. Standards guaranteeing the compatibility of equipment in the various institutions (see Chapter 3) are their most important elements.

The committee will undertake for 1983 an in-depth analysis of the plans for data processing in the various institutions in order to achieve greater integration. The committee will stress to the heads of administration the need for a small documentation centre on data processing to provide regular back-up to interinstitutional cooperation. The Commission has been asked to run this centre, which would be available to the other institutions.

The CII also constitutes the necessary framework for the management of interinstitutional projects (users' committee): i.e. administrative management of staff, publication systems and interinstitutional data bases (CELEX, CEDIN: see Table 6), and more particularly projects for the INSIS programme.

INSIS (Interinstitutional System of Integrated Services) is an ambitious programme which aims, by setting up communication systems and applications incorporating new information technologies of interest to the European institutions and administrations of Member States, to stimulate innovation on the data processing market in Europe, while at the same time encouraging the development of international standards for the compatibility of hardware and software.

The Commission's contribution to this programme depends on cooperation among DG III, DG IX, DG XII, DG XIII and the SG (for abbreviations see Annex IV). In view of its responsibility to users, the Directorate for Informatics is very much involved in this programme and takes account of the INSIS programme in setting out its General Guidelines (Chapter 3) and its proposals on infrastructure (Chapter 6). The first projects with an important interinstitutional content include the construction of an inter-institutional electronic mail network (INSEM) (see Chapter 6, Table 7) and video conference tests. In the short term the setting-up of experimental projects should prepare the ground for technical decisions on medium-and long-term policy.

9. QUALITY AND AUDIT

The quality of any data processing service may be assessed in terms of user satisfaction. Good programming of an application does not necessarily guarantee satisfactory quality. Certain criteria must, moreover, be respected as regards reliability, security, ergonomics, comfort and assistance.

Users everywhere are constantly demanding better quality from data processing applications, which in time will be expected to reach the level achieved in other branches of human activity (trains, cars, aeroplanes etc). A special effort is required in the Commission in view, on the one hand, of the successive conversions in recent years (c.f. Chapter 1, section 4) and, on the other hand, of the great variety of hardware and software.

For this reason, the Commission decided to set up a "Quality management and internal audit" department, which came into being in the second half of 1982. This department operates with a small permanent staff but with a budget enabling it to call in outside consultants.

Its main tasks are:

to devise plans to ensure quality and reliability, and to monitor their implementation by the data processing services. These plans include ergonomic factors, which are regarded as one aspect of quality, and are considered in close collaboration with the staff representatives and the Health and Safety Committee;

to carry out internal audits (audits on organization, projects under development, existing applications, etc).

For 1983 the programme will concentrate on:

cost/benefit analysis (methodology and audits) to indicate priorities for new projects;

quality and reliability standards;

audits;

ergonomic analyses of work stations.

10. DATA PROCESSING BUDGET

In 1982 new short and medium-term planning methods for data processing activities were introduced. These form the basis for the estimates of expenditure given in the various Chapters of this report. Table 10 summarizes the figures and distinguishes between the sums allocated and the expenditure arising out of the data processing plan. The difference between the two is due to the carrying-over of sums for contracts for work carried out over two financial years and also to appropriations carried forward.

1982 was also the first full budgetary financial year in which the operational integration of the various aspects of data processing (data processing proper, text processing, reprography and telecommunications) was fully achieved. This initial experience made it clear that the budgetary nomenclature required redefinition in order to harmonize it with the expenditure on data processing, as the tables in this report also indicate.

For 1983 the gradual introduction of analytical accounting will make it possible to extend the concept of total cost of data processing activities. The first results will be published in the 1983 annual report.

An analysis of Table 10 reveals three features of the data processing budget, which has to finance an expansion of between 25 and 30% per annum in services provided for users:

- Decrease (in constant ECU) in appropriations for items 210, 212 and 213, despite the rapid expansion of the corresponding services. This is due to rationalization and negotiation with suppliers, but above all to investment (item 210) making it possible to reduce the volume of expenditure on external services (items 212 and 213);

- Rapid growth in appropriations for distributed networks and equipment (items 211 and 222), since this sector requires an injection of investment in the form of infrastructure equipment (data network and electronic mail) in order to reach its normal operating rhythm.

- Rapid increase in funds for infrastructure development (Chapter 6) and in particular for applications (Chapter 7). This sector has suffered from an abnormally low level of financial resources (9% of the total budget in 1982) which has prevented it from making up past delays.

This analysis shows clearly that it is essential to increase the volume of appropriations available for data processing to a critical minimum threshold of approximately 33.2 million ECU (constant at 1983 rates) for Chapter 21 (see Table 10).

The investments made will then make it possible to maintain the expansion of services for an almost unchanged cost (in constant ECUs) by means of rationalization programmes, but also in view of the gradual reduction in price of data processing equipment (see Table 10 - 1985 funds for (Chapter 21). These conclusions have already been brought to the attention of the budgetary authorities for the 1982 and 1983 budgets following an experts' report in 1981 presented by three outside consultants (a DIEBOLD company executive, a French civil servant and the informatics director of a large German company). It is important to understand that spreading the increase funds over a period in order to achieve this critical level would simply delay the rationalization programmes which will make it possible to stabilize the budget.

Since expenditure under items 210, 212, 213, 215 and 231 is by its very nature inevitable, a reduction in the budgetary appropriations requested would have a direct effect on the following actions:

- progress with electronic office equipment and distributed data processing equipment, and the corresponding productivity benefits (items 211 and 222);

- the implementation of an interinstitutional electronic mail service (item 214 - see also Table 7, project 3);

- the implementation of new projects (see Table 9) and the work undertaken to reduce the waiting period from five to three and a half years (item 214) (see Chapter 7).

TABLE 10
APPROPRIATIONS FOR DATA PROCESSING (IN ECU)

Article	Description	C = Commitments E = Expenditure	82	83	84(a)	85(a)
210	Operation of Computer Centre	C	9.53	8.16	9.12	9.12
		E	9.30	9.70	9.40	9.40
211	Data processing networks	C	4.38	6.78	8.10	8.32
		E	4.38	6.94	8.93	9.42
212	Data Processing operating staff costs	C	2.49	2.22	2.28	2.10
		E	3.20	2.40	2.30	2.10
213	Data processing operations carried out by outside contactors	C	3.80	3.87	3.14	2.89
		E	3.80	4.00	3.11	2.89
214	Analysis and programming, pre-analyis and special projects carried out by outside contractors	C	3.95	6.31	9.71	10.12
		E	3.75	7.20	10.36	10.49
215	Documentary analysis carried out by outside contractors	C	0.85	0.66	0.85	0.85
		E	0.73	0.80	0.85	0.85
21	TOTAL CHAPTER 21	C	25.00	28.00	33.20	33.40
		E	25.20	31.00	35.00	35.20
220	Office machinery	C	0.65	0.75	0.85	1.10
		E	0.65	0.75	0.85	1.10
222	Technical equipment and installations (c)	C	3.75	3.75	5.10	5.27
		E	3.75	3.75	5.10	5.27
223	Services and telecommunications (d)	C	7.60	7.70	7.90	8.50
		E	7.60	7.70	7.90	8.43
	TOTALS CHAPTERS 21, 22 and 23	C	37.00	40.20	47.05	48.30
		E	37.20	43.20	48.85	50.00

(a) In constant '000 ECU (mECU) (1983)

(b) Appropriations requested totalled 30.50 mECU in 1982 and 32.50 mECU in 1983

(c) These figures do not include the non-data processing appropriations included in the same Article

(d) These figures show only appropriations for telephone rentals

11. CONCLUSIONS AND FUTURE PROSPECTS

The objectives set out in Chapter 1 will be achieved insofar as, on the one hand, a critical minimum threshold of funds (see Chapter 10) is granted and, on the other hand, 20 extra posts are obtained. These posts are intended to put an end to our dependence upon staff under contract in areas where such dependence is regarded as dangerous for the Commission (Chapter 2). This is particularly true as regards the managerial staff required to supervise the large number of outside staff engaged in the applications development.

Applications development is in fact the sector in which the lack of resources gives most cause for concern. After the years of conversion there is a considerable backlog to be worked off. But even taking account of the significant increase in funds for development envisaged in the data processing plan, existing resources will be fully committed until mid-1986. The result is that it will not be possible to start any projects which might subsequently be added to the list shown in Table 9 (Chapter 7) before that date.

Savings are, of course, planned (see Chapter 4, Chapter 6 - project 10 and Chapter 7), but it is difficult to maintain a rate of expansion of between 25 and 30% per annum with a constant work force. But it is precisely this expansion in data processing application which will enable the Commission to increase its production and thus to accept the additional tasks requested by the Community. This will require far-reaching changes in administrative tasks, and success will depend on a major training scheme and close cooperation with staff.

At the technical level hardware and software manufacturers in Europe must be encouraged to increase their efforts to improve the compatibility of their equipment. The integration of heterogeneous equipment is a costly exercise in the Commission (see Chapter 6, Table 7 - projects 2, 4, 5 and 6) and in many organizations in Europe, which are increasingly finding themselves in the same situation. The Commission certainly has a role to play here as champion of European data processing users - a role which is fully compatible with its task of promoting the data processing industry. A suitable beginning would be to work more closely together with similar administrative bodies (see Chapter 8).

Finally, it is clear that it is essential to strengthen cooperation between the European institutions in order to improve communications and to economize on the data processing resources of each institution.

PART B

DATA PROCESSING IN THE JOINT RESEARCH CENTRE

INTRODUCTION

The main requirements of the Ispra establishment in respect of the processing of scientific, technical and administrative data are met by the Computing Centre.

In addition, a number of laboratories possess dedicated minicomputers which are used either in the capture or pre-processing of experimental data or in the processing of highly-specialized data such as images.

The developments in data processing are in line with a plan established during 1979-80 for the JRC's 1980-83 programme.

In addition to its activities relating to data processing projects, the Informatics Division of Department A is responsible for management of the Computing Centre, and the head of Division is head of the Computing Centre.

A Users' Committee, whose members are designated by the Director of the Establishment, and which comprises mainly the heads of Departments and Directorates, together with any advisers they consider appropriate, meets from time to time at the request of the Director of Department A and under his chairmanship to draw up general guidelines for the head of the Computing Centre which will ensure that users' requests are optimally met.

Moreover, each head of Division has appointed a data-processing assistant whose role is to maintain contact between the staff of the division and the head of the Computing Centre.

The budget of the Computing Centre consists of an Appropriation Account (1.30.2) funded from the various programmes in proportion to the services rendered to each programme. This implies invoicing of services to each user.

The activity of the Computing Centre covers:

- operation of the computers, including the internal data transmission network;
- the establishment and maintenance of the basic software;
- the establishment and maintenance of technical and scientific libraries, including very large general utility programs, relating in particular to engineering;
- user support consisting of

  direct oral information;

  organization of courses and seminars;

  written distribution of detailed information (10 annual publications);

  drafting of concise manuals on technical subjects.

The need for data processing hardware and software is determined periodically by user surveys supplementing the information available from Computing Centre development experience and from actual trends in the use of the data processing facilities.

The Computing Centre obtains its equipment by invitation to tender, following approval by the ACPC-JRC (Advisory Committee on Procurement and Contracts) and the Management Committee for Data Processing in the Commission.

Supplies to the Computing Centre have to meet the requirements of the Standard Implementation Committee (SIC) recommendations.

The contract with Amdahl Italia was amended during the course of the year by the addition of an annex relating to norms and standards.

1. INSTALLATIONS, DEVELOPMENT, SHORT AND LONG-TERM FORECASTS

The current equipment was selected following invitations to tender in 1979 and 1980.

Installation began in August 1980 and continued during 1981 and 1982 as need arose.

However, the installed computing capacity is becoming inadequate for users' needs.

In this context it should be noted that the statistics covering a period of more than 10 years show that every year the demand for processing on the CPU has increased by practically 30 % over the previous year. This is normal, given that an annual increase of 25-35% has been general in the research centres.

With regard to the need for random access peripheral memory, the useful statistics cover fewer years but also give a growth rate of 1.3 per annum.

In addition, users have asked for a diversification of computing facilities to allow them to run their programs on the type of computer for which they were designed, thus avoiding conversion problems which can in certain cases be tricky.

2. EQUIPMENT CURRENTLY IN THE COMPUTING CENTRE

The Computing Centre hardware consists principally of one Amdahl 470/VB mainframe computer supplying 6.5 Mips, a wide range of peripherals and a network of seven Solar 16 computers.

The hardware was significantly augmented in 1982 by extension of the central and peripheral memories.

Some 160 VDUs and about 20 minicomputers provide RJE facilities around the Ispra establishment.

Details of the current configuration are given in Table C.

Access to the computer is further facilitated by an internal network of seven French-manufactured Solar 16/65 computers (SEMS) which, in addition to being used in the Teleinformatics project, allow access to the central computer via Euronet.

With the agreement of the Management Committee one of these minicomputers was installed in DG XII at the end of 1982 with the aim of encouraging co-operation between the Commission departments and those of the JRC.

This project was carried out with the aid of DG IX and DG XII Brussels.

3. STAFF, BASIC SOFTWARE AND OPERATION

STAFF

In January 1982 the staff of the Computing Centre was 27 units and reached 30 units in December 1982, while remaining below the envisaged budget complement of 36.

The staff is made up as follows:

	JANUARY	DECEMBER
General management	2	2
Operation	10	10
Data capture	3	3
Basic software	5	8
Networks	2	2
User support	5	5
	27	30

During the course of the year the staff took part in a series of specialization courses and seminars, with the aim also of preparing for new developments.

BASIC SOFTWARE

Until December 1982 the computer was operated using a totally obsolete system (MVT).

It became possible to move up to another system only when a more recent generation of computer was installed.

When the new computer became available the need to prepare carefully for the changeover to the new system without inconveniencing users either during the installation or during the changeover itself required a long period of organization and preparation.

The new operating system (MVS) came into service on 1 January 1983 and the two systems will be operated in parallel for six months so as to allow users to convert their applications gradually and painlessly.

Whilst MVS is being run in, and until MVT is taken out of service, the two systems will be run under the control of a third, VM, which will ensure an equitable apportionment of resources between the two operating systems.

Virtually all installation and maintenance of the operating systems is carried out by Computing Centre staff.

OPERATION

The computer is operated in three shifts:

- 2 shifts with operator control from 07.00 h to 24.00 h
- 1 unattended shift from 24.00 h to 07.00 h

In addition, Saturday mornings are devoted to the maintenance of files recorded on disks. This work is done in overtime.

Unattended operation (without operators) allows sequences of very long programs to be executed without the need for additional posts which are in any event not available.

4. SERVICES PROVIDED

DATA PROCESSING

During 1982, use of the Computing Centre was as follows:

CPU hours in problem mode invoiced:	2402
including batch processing:	2018
and conversational mode (TSO):	384

covering 99 100 batch operations
and 76 600 time sharing operations.

The increase in productivity as compared to 1981 is approximately:

38 % for batch processing

65 % for time sharing

These services are allocated between the various programmes and Appropriation Accounts (Administration) as shown in Table A.

Some 90 % of the activity of the Computing Centre is directed towards service to research programmes, 9 % is support to General Services and a little less than 1 % results from external contracts, some of which benefit other departments of the Commission.

USER SUPPORT

In addition to the oral consultations, which total approximately 30 daily, courses covering various subjects of interest in data processing were organized, and 10 numbers of "Computing Centre Newsletter" and the following four publications were published:

Converting CDC FTN4 to IBM FORTRAN IV	May 1982
JRC Computer graphics	May 1982
The Librarian	May 1982
The Computing Centre Program Library Vol 1: Program Descriptions	September 1982

Computing Centre staff also contribute to the JRC training programme, which includes a large number of data processing courses at different levels for Computing Centre users.

5. THE BUDGET

COST

In addition to the secondary budget relating to staff salaries, the Computing Centre has a primary budget covering all other expenditure such as hardware rental, software, purchases, maintenance, expendable items, etc.

In 1982, Computing Centre appropriations were as follows (in '000 ECU):

Primary	3 000
Secondary	1 038
TOTAL	4 038

The larger items of expenditure are broadly analysed in Table B.

PRICE AND PERFORMANCE

The Computing Centre is attentive to the price/performance ratio of its equipment.

For 1982 the figures are:

central processing unit performance:	6.5 Mips
annual cost:	840 000 ECU

1 Annual Mips = 129 200 ECU

disk capacity:	12.2 Gigabytes
annual cost:	396 000 ECU

1 Annual Gigabyte = 35 400 ECU

It should be noted in passing that the installation has approximately 2 Gigabytes of peripheral memory per Mips of central processing unit.

Taking the total cost of the Computing Centre, we can say that:

6.5 Mips + 11.2 Gigabytes cost 4 038 000 ECU in total

The annual cost of 1 Mips + 2 Gigabytes is about 621 000 ECU or Bfrs 28 million, i.e. 2 330 000 Bfrs/month.

In addition, each CPU hour produced (2 402 hours) costs 1 681 ECU, which amounts to 0.0718 ECU or approximately Bfrs 3.25 per million instructions produced.

This price is very favourable in comparison with the cost of services offered by service bureaux and others.

6. CONCLUSIONS

For the Computing Centre the year 1982 was marked by a high degree of hardware and software reliability, an increase of approximately 35% in use rate and a slight increase in computing capacity, principally in memory.

However, we consider that the central unit is reaching saturation point, and preliminary planning with users has already begun.

TABLE A

DISTRIBUTION OF SERVICES

OVER THE VARIOUS PROGRAMMES AND APPROPRIATION ACCOUNTS

73001	Reactor safety	43.16%	
73003	Safety of nuclear materials	0.67%	
73004	Fissile materials control and management	3.20%	
73005	Super-SARA Test Programme SSTP	22.31%	
Total			69.34%
73011	Solar energy	0.96%	
73012	Hydrogen production, energy storage and transport	0.06%	
73013	Theromonuclear fusion technology	3.22%	
73014	High temperature materials	0.61%	
Total			4.87%
73021	Protection of the environment	8.40%	
73022	Remote sensing from space	0.15%	
Total			8.55%
73041	Informatics	5.96%	
73043	Support to BCR	-.-	
73046	Training and education	1.16%	
Total			7.12%
1.20	General administrative and Technical Services - Ispra	7.89%	
1.30.3	Central workshop - Ispra	0.17%	
1.40.2	ESSOR	0.41%	
1.50.1	Scientific divisions	0.67%	
Total			9.14%
1.94.0	Services to external users		0.96%
			100.00%

TABLE B COST DISTRIBUTION

Leasing and maintenance of the main computer	840 000 ECU
Leasing and maintenance of random access peripherals	396 000 ECU
Other hardware leasing and maintenance	784 000 ECU
Leasing of software	390 000 ECU
Electricity	125 000 ECU
Maintenance of premises (fire protection, etc)	65 000 ECU
Expendable items	125 000 ECU
Minor expenditure (modems, racks, etc)	135 000 ECU
Sundry contracts	140 000 ECU
	3 000 000 ECU

TABLE C

COMPUTING CENTRE CONFIGURATION

1 Amdahl 470/V8 providing	6.5 Mips
20 moving arm interchangeable disk units providing	3.6 Gigabytes
24 moving arm fixed disk units providing	7.6 Gigabytes
1 fixed head disk unit providing	11.5 Gigabytes
1 random access peripheral providing	23 Megabytes
6 high-density magnetic tape units (6250/1600 bpi)	
3 medium-density magnetic tape units (1600/800 bpi)	
2 punched card readers	
1 punched tape reader	
3 impact printers with total print capacity of 4000 lines per minute	
2 telecommunication control units each handling 96 communication lines and connecting directly more than 160 conversational terminals and about ten RJE terminals (some RJE terminals can then connect to further conversational terminals or RJEs).	

A N N E X E S

ANNEX I

1981-86 GUIDELINES FOR DISTRIBUTED DATA PROCESSING IN THE COMMISSION AND OTHER COMMUNITY INSTITUTIONS

Introduction

On 7 May 1980, the Commission adopted the following decision:

> "The Commission adopts, in principle and as a long-term objective, its policy for the development of new information technology, with a view to guiding its own departments towards the integration of data-processing, office automation and telecommunications; the Commission furthermore agrees that such an objective may be achieved by the implementation of a distributed data processing network, which could take five or six years."
>
> (COM(80), P.V.558).

Pursuant to this decision, the Commission approved on 20 May 1981 a report of which the second Annex included "Guidelines for 1981-86 regarding distributed data processing within the Commission" (1). The essential contents of that text are given below, and it may be examined in full by referring to Document SEC 780-1, amendments 1, 2 and 3.

The document was extended on 27 July 1982 at the Meeting of the Inter-Institutional Committee for Informatics and given an inter-institutional dimension.

The aim of this document is to present:

- general trends in data processing (Chapter 1);
- factors specific to the Commission (Chapter 2);
- factors specific to the other Institutions (Chapter 3).

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(1) Doc. CII 81-08

In the remainder of this document, the term "data processing" will be used not in its original narrow sense, but in the broader sense of the gradual integration of data, text, image and voice, including office equipment (office automation) with the support of a telecommunications network (telematics).

By "distributed data processing" must be understood a network of data processing equipment, serving users at their place of work and in addition giving access to centralized data processing. Even when the word "distributed" is omitted, "data processing" retains this meaning, while central data-processing services will be always indicated by "computer centre".

1. GENERAL TRENDS

1.1. Fall in equipment costs and increase in staff costs

Continuing progress in the field of micro-electronics is resulting in falling equipment costs (memory 40% per annum, data processing logic 25% per annum, telecommunications 11% per annum).

The architecture of information systems has consequently to be redefined. Geographically, cheap computer capacity can be located wherever it is needed. Technical constraints thus being gradually eliminated, staff costs will constitute the principal factor in determining technical solutions. It will thus be possible to increase considerably the productive per capita investment in the tertiary sector, which at present is only Bfrs 0.1 million, compared with Bfrs 1.4 million in industry and Bfrs 2 million in agriculture.(*)

Distributed data processing will be an essential tool in improving human productivity and the decision-making process. These must be the primary criteria in selecting equipment or an organizational model for user service.

1.2. Users' data processing know-how is becoming a critical parameter

Computer training schemes, personal interest and the technical possibilities offered by data-processing equipment suppliers mean that many users no longer wait for the help of the central services in order to improve their productivity. They try to find their own solutions, using their own staff to design the tools they need, sometimes without taking account of established rules and priorities.

This development should not in any way worry central data processing staff, for it is a healthy and progressive trend, even if it requires expensive training. It should, however, induce computer professionals to rethink their role, which must now be to concentrate on infrastructure, guidance and control, in order to protect the investment in user software from the conversion problems implicit in a technology under constant development. Henceforth, standards, method and firm control over the development of activities will be of primary importance.

1.3. From the terminal to the multifunction work-station

Traditionally a terminal formed an integral part of the computer configuration to which it belonged, resulting in a different terminal being used for each type of service.

For obvious reasons of productivity, no-one wants to have a series of terminals in his office. Consequently, in future the official will be given a multifunction work-station with the power of one of today's average computers, which will provide him with a full range of services: text preparation, editing and processing, telex, teletex, videotext, facsimile, electronic mail, individual document management, network access to computer centres, remote information bases and even conventional telephone facilities.

Of course, this integration of services by the multifunction work station will not occur overnight, and many stages of partial integration will be needed before integration is complete.

It is thus recommended that maximum flexibility be built into any new data-processing applications, so as to allow for future integration.

As for Europe, the development of multilingual services and work stations is an additional challenge which the vast English-language markets do not have to face, and European manufacturers may hope to transform this handicap into a market advantage.

1.4. Integration of the services in the network

With the rapid development of wide-band digital transmission, the integration on the same network of data, text, image and the spoken word will in the future be possible. This will lead to an integrated service digital network (ISDN); the speed at which it can be implemented will depend on many constraints other than the purely technical.
For this reason, progress can be appreciably slower in the case of the public networks than in that of the private local networks interconnecting work stations within the same organization. Fortunately, the integration of the full range of services on the network is not essential to the integration of services at the work station, provided that the station has access to the various networks available.

In the near future work stations and local archives will be interconnected using telephone pairs or coaxial cables, and later by local networks (of the ring or broadcast type, possibly with transmission by optical fibre), the architecture of which will depend on the possibility of connecting communities of users; interfaces with the public network will be available for external services.

1.5 Future of computer centres

With the falling prices of equipment, the cost of running a computer centre will depend increasingly on the cost of the personnel for the management, administration, operation and engineering of the system. The minimum organization of a computer centre will thus become a fixed cost which is so high that only centres with large computing capacity will be economically viable.

For this reason the majority of present-day computer centres of average size will disappear and be replaced by network connections with the large centres.

The large computers will specialize more and more in data bases and batch processing, to which they are best suited. If well designed they will be able to provide an excellent and rapid service in an environment of multiple applications.

Adding a major time-sharing service for individual users to the usual tasks of data bases and batch processing has always raised difficult problems of management with large computers. Individual work involves the appearance of workload peaks which are difficult to control and have a negative influence on response time for all the other applications. It is therefore preferable, where possible, to devolve this individual work onto interactive minicomputers serving a more restricted community of users.

If for some reason one application must be protected from interference by others, a dedicated computer is the ideal solution. This option does not exclude communication with the network. It is a further argument for adopting the general philosophy of distributed data processing.

1.6 Minicomputers

The interactive minicomputer in conversational mode will continue to play an important role in distributed data processing for some time. It can meet the internal needs of a small community of users and connect that community to the services available on the network. It can inter-connect groups of from 5 to 30 local terminals and printers and provide the functions which will at a later date be incorporated in the multifunction work stations (see 1.3). Minicomputers will soon have the power of present-day average size computers and specialize in interactive work: individual data processing, word processing and local electronic mail. They will also be able to hold files common to the members of the community served and to provide connection to the network, making it possible to reach data bases and remote batch processing.

It is essential that interactive minicomputers should not be small scale reproductions of a computer centre, for that would be far from economic in terms of operating staff (see 1.5). Interactive minicomputers should therefore be autonomous and not require operators other than the user at the work station.

1.7 Information management, files and data bases

Three important cost factors can be considered in information management: the cost of generating data (writing, keying, verification, correction), the cost of storing the information and the cost of access to the data.

The cost of creating data is 100 times greater than its access cost per annum and 1000 times greater that its storage cost per annum. The preparation of text and data is therefore by far the most expensive operation in an organization, for it consists almost exclusively of staff costs.

This will be even truer in the future. Any document which has to be re-keyed or recoded will represent a 100% loss. For this reason text processing at the points of entry to the network, together with file transfer facilities from one data base to another, are the most interesting stages in the development of distributed data processing.

Individual files can be available on work stations, the files belonging to a particular organisational unit being available on an interactive minicomputer or a local network, but data bases serving a complete organization, or even the outside world, will remain in the large computer centres, for it is there alone that profitable low-cost storage and management can be set up to allow control of large volumes of information.

1.8 Work suitable for distributed data processing

Distributed data processing is not synonymous with independent local data-processing applications. It is likely, moreover, that future applications will at the same time use local and remote facilities.

The functions best suited to distribution are those involving small quantities of data to which frequent access is necessary.

These functions include:

- work stations (VDU consoles, keyboards, printers, etc.) for access to telex, teletex, videotext, electronic mail and telecopy services;
- input preparation (including text and data input, text processing, data verification, etc);
- supply of ad hoc output in printed or graphic form;
- individual data processing on local files or extracts from central data bases;
- management of small and medium data bases serving a local user group.

1.9 Standards are essential for integration

Distributed data processing networks will certainly not be made up from equipment which is all from the same manufacturer. However, the interconnection of equipment from different sources is impossible without satisfactory compatibility standards. Since the current trend is for suppliers to promote only the compatibility of their own products, it is in the consumer's interest that international standards be made obligatory. Such international standards will thus define a market in which free competition can play its part to the benefit of the general economy.

The fundamental problem in the definition of standards is that on the one hand they are difficult to impose if they are defined too late, and on the other they hamper technological progress if they are imposed too early. This is why it is in fact standards, more than any other factor, which determine the industrial expansion of computer products.

1.10 Integration of the support organization must precede the technical integration of services

Integration of services for the user (see 1.3 on multifunction work stations) will also lead to the need for contact with a single support organization covering the full range of those services.

Distributed data processing services cannot be implemented merely by buying and installing the hardware. Detailed medium and long-term objectives must be set, in particular in terms of network development. These aims must be based on all known and foreseeable parameters, including user needs, as well as on strategies to achieve them.

The implementation itself must be in accordance with those strategies and make progress from day to day - by utilizing technical possibilities to improve connections, and by establishing compatibility links between new and existing equipment.

This will only be possible with a team capable of dealing with the day-to-day requests, the technical modifications and installations covering the entire community of users.

Nevertheless, distributed data processing is much more than a problem of technical integration; its main purpose is to offer assistance to the user, and this implies many changes in administrative methods and procedures. Distributed data processing cannot be implemented without adequate motivation, training, human support and follow-up. The know-how required here is not technical but multidisciplinary, and is based on commonsense, compromise and the understanding of user attitudes.

In short, distributed data processing will develop not merely as the result of technological possibilities, but only if it is founded on an integrated support organization.

2. FACTORS SPECIFIC TO THE COMMISSION

2.1. Demanding environment

The Commission is a demanding environment for distributed data processing: large volumes of data generation and mutilingual texts, large data bases for internal and external use, large volumes of statistical or other individual work, massive amounts of translation work, heavy inter-departmental document traffic, permanent inter-institutional contacts and, last but not least, the need for quick and efficient administrative procedures.

There is no question that the distributed data processing intended to support the functions described in paragraph 1.8 will involve the Commission and the other European institutions in major capital expenditure. It is generally recognized that with these investments general administrative productivity (production per capita) can be improved by approximately 20%, and obviously this can contribute to expansion of the Commission's activity without a proportional increase in personnel.

2.2 User participation

Many Commission users have taken steps on their own initiative as regards distributed data processing, not only for the reasons set out in 1.2, which apply to most modern organizations, but also because the central data processing staff have for many years been overburdened with conversion work. The budgetary and staff constraints have not hindered such initiatives, which is an indication of the urgent nature of the users' needs.

That is a positive and promising development, provided that it can be properly controlled. In a distributed network environment the uncontrolled proliferation of independent users would inevitably lead to chaos.

This is why the installation of a management and control structure covering the whole of the Commission was decided upon. Within this structure users and computer centre personnel can work together within a unified framework of rules and procedures where the responsibilities of all those involved are clearly defined.

2.3 Internal Commission network

For historical reasons, data-processing equipment from the top and bottom of the range was not supplied to the Commission by the same manufacturer, and this raises major compatibility problems. This is a handicap but also a challenge, for it brings us to the heart of the problem earlier than in other organizations where attempts are made to put off the moment when the problem must be faced.

In this environment, the planning and development of an internal network to link this broad range of equipment and provide users with integrated services become an urgent priority, to which suitable staff and financial resources must be allocated. The design and the planning of this network are of critical importance, for they constitute the framework for the next five years, during which new integrated services can be developed and new equipment and applications introduced in an organized manner. In this way urgent needs can be met without compromising future developments.

2.4 Industrial policy - research - innovation - internal service

The Commission's industrial policy on data processing and telematics in Europe inevitably requires its own departments to support that policy in practice. The Commission wishes to stimulate the postal and telecommunications administrations and European industry by launching research and innovation projects, the goal of which may well go beyond internal requirements, and for which the collaboration of the Commissions's own departments and users is necessary to ensure that these innovation projects really achieve their objectives. Furthermore, the integrated internal services should provide adequate and reliable tools to all users, including those who are not covered by the policy and innovation priorities. It is natural that the goals of the innovation policy and internal requirements should lead to practical differences in day-to-day management. It is therefore necessary to create organizations and mechanisms to reconcile those technical differences, and to monitor them at appropriate levels of authority. The most suitable instruments for this purpose are the definition of internal standards, procurement policy and innovation projects.

Adequate coordination aiming at harmonizing the diverse aims of data processing within the Commission require the cooperation of DGs III, IX, XII (JRC) and XIII.

2.5 Internal standards

The internal standards must conform to the international standards and, in the absence of approved standards, be supplemented by local agreements in accordance with the Commission's policy. Temporary deviations from internal standards must be justified by reasoned requests and approved and followed up from a central control point. Standardized interfaces must be provided to integrate non-compatible equipment.

2.6 Procurement policy

Procurement policy must be in accordance with the approved standards, and the contractual agreements with suppliers must be used to enforce those approved standards as well as the Commission's policy in this respect.

Supplies intended for the internal service will generally have to be guaranteed as being of a recognized quality, while supplies destined for innovation projects can be used as an incentive for European industry to develop new products meeting the specifications of the invitation to tender.

2.7 Innovation projects

If innovation projects sponsored by the Commission are to yield an internal service, the authority of the Director for Informatics must be recognized from the outset. In such cases, his organization has not only do all it can to assist the project, but also cope with the risks that an innovation project inevitably involves. It will thus be necessary to agree case by case on terms of responsibility before any project is delivered for operational use.

2.8 The Commission Computer Centre

The concentration of general computer capacity in one place is justified on economic grounds (see 1.5), particularly where large-scale information systems are concerned. The future of distributed data processing will make the Luxembourg establishment even more useful than in the past, provided that a suitable internal Commission network improves considerably its accessibility for each user. For the reasons indicated above (1.5), it is also preferable that where possible individual computing should be carried out on minicomputers, working in association with the Computer Centre in Luxembourg and serving a more restricted community of users.

2.9 Priority for the development of distributed data processing

The new central data processing organization which it was decided to set up on 1 August 1981 forms the basis of the structure which will coordinate, assist and monitor the development of distributed data processing. It is indeed essential that such an organization should exist, in order to channel and coodinate the local developments in data processing amongst users so as to avoid the uncontrolled development which would be prejudicial in the long term to the entire community of users within the Commission.

Moreover, collaboration between the institutions is now beginning to take shape, in particular through joint projects such as the inter-institutional network INSIS, and it will henceforth be necessary to ensure that the Commission's system of distributed data processing is compatible with INSIS.

3 FACTORS SPECIFIC TO THE OTHER INSTITUTIONS

3.1 Environment

The Commission constitutes a complex and varied environment with a total manpower of more than 10 000 officials; i.e. more than all the other institutions together.

As an institution it has operational sectors, but also industrial policy and standardization objectives, particularly in the data-processing sector.

The first studies undertaken for INSIS show that by 1990 the Commission could have several thousand work station users.

The other institutions represent a more restricted environment which does, however, total several thousand officials. The functions of these institutions are primarily operational and thus:

- have specific requirements connected with their role in the functioning of the Community (management of parliamentary procedures, follow-up of current business, meetings of experts, document preparation and production, etc)

- need to be connected to the Commission network, mainly for access to the large documentation data bases (with, in certain cases, cooperation on input to the data bases).

In all cases, data processing in the other institutions has to take place close to the user who is involved in each application.

3.2 Distributed data processing in the other institutions

The general remarks set out in Chapter 1 and more specifically in paragraphs 1.5 and 1.6 on the future of computer centres and the role of minicomputers apply to all the Community institutions.

For this reason it can be said that:

- first, the other institutions should not develop computer centres for batch processing or the operation of large documentation data bases. Indeed, such centres are not justified economically when they are on a small scale, because of the costs of management and applications development. Modern telecommunications eliminate most of the disadvantages of geographical distance from a host centre;

- in addition, a community of up to two or three thousand persons should be served by a small interactive computer. Indeed, such communities imply a time-sharing workload which would be neither economical nor effective on even one single large computer. As is explained on page 5, overconcentration of a computer centre and its workload can only result in general deterioration of the response time for all users. This observation has been confirmed in the Commission itself and applies a fortiori to the Community as a whole.

3.3 Integration of other institutions' data-processing facilities with those of the Commission

As is explained in 1.10, integration must be looked at from the point of view both of the support organization and of the technical aspects of the services.

(a) organizational integration

In addition to the management and control structures within each institution (see p. 11), the Inter-Institutional Committee for Informatics has a coordinating role at the inter-institutional level. However, this committee must have a minimum of full-time staff, in order to:

- keep up to date the unified framework of rules, procedures and Community policies in which all the partners must co-operate;

- collect and provide information and documentation on all the facilities, hardware and software available, as well as on all current projects.

(b) technical integration of facilities and services

In general, technical integration implies compatibility and even, frequently, identity of equipment. However, strict identity would reduce the openness of the market and in extreme cases could bind the institutions to a single supplier, which is not acceptable. This is why this integration must be achieved by:

(1) respecting the standards and norms approved by the C.I.I., as regards both the supply of equipment and the development of software;

(2) integrating the networks. Over the period 1981-1986 considered in this document this can be achieved by:

- the compatibility of terminal procedures and a move towards the "demystification" of terminals. The Commission has projects under study in this field (in particular LDH software and the RPP protocol);

- generalized exchange of files between computers. Until international standards are available, the Commission is implementing a standardized system, NIFTP (Network Independent File Transfer Protocol);

- direct interconnection of computers when justified (i.e. when the software burden of the interconnection is compensated by machine time savings);

- shared use of telecommunications resources, using in the short-term the Commission's package mode private network, and in the longer-term the inter-institutional network INSIS.

ANNEX II

PROCUREMENT GUIDELINES FOR COMPUTER SERVICES AND EQUIPMENT

FACTORS INFLUENCING EQUIPMENT PROCUREMENT

1. As a result of technological advance it is now necessary to modify the selection criteria for the replacement or procurement of informatics equipment (*).

   Hardware costs are decreasing all the time (they now represent less than 30% of total costs); manpower costs are increasing all the time (these account for the remaining 70% of total costs).

2. In evaluating equipment it is therefore necessary in future to take into account not only hardware prices but associated manpower costs:

   - the equipment of different manufacturers requires differing numbers of people to operate it (including users) - this influences total costs;
   - conversion costs (the direct manpower costs plus the disturbance factor - paralysis of new development while the conversion is taking place) are to be avoided whenever this is possible.

THE PROBLEM FACING THE COMMISSION AND OTHER EUROPEAN USERS

3. Considering the evolution towards distributed processing the Commission is faced with the same problem as other European users of informatics equipment. It does not want to depend on a single supplier and therefore has to work with different manufacturers and service companies

   For that reason hardware and software should not only satisfy user needs with competitive price/performance, but must also follow international and European standards so that equipment of different suppliers can be interconnected.

(*) By equipment is meant the hardware plus the software (e.g. operating system etc.) that has to go with the machine to make it function.

By informatics is meant not only data processing. Informatics is used in its widest sense to mean the progressive integration of textual data, image and voice, including office equipment, and is supported by a telecommunications network (telematics).

4. In addition, it wishes to avoid the cost of paralysing effect of conversion of programs when equipment of one manufacturer has to be replaced by equipment for cost/benefit reasons.

   Conversion costs tend to be underestimated because only one of the three components, the direct conversion cost, is tangible.

   a) The direct conversion cost includes the manpower (manyears) and expenses to undertake the conversion (e.g. software modifications, overlapping equipment rental, user training, etc.).

   b) The disturbance cost includes the productivity drop of the users during the changeover as well as the extra cost to compensate for lack of good service.

   c) The opportunity cost refers to the lost benefits when money of the informatics budget is deviated from profitable investment in application projects to conversion work. For well justified projects the benefits over the lifetime of the application are much more than the application investment.

   As far as possible it is necessary to attempt to estimate the weight of all the factors in the conversion exercise. Each of the indirect costs must be taken into account when evaluating the total cost. Where for some reason these can not be quantified it is likely that each is equal to the direct costs.

   Replacing computers by less expensive ones makes sense only if the resulting total conversion costs can be covered by a sufficient rental difference or by other benefits.

5. The Commission should be able to give an example and a lead to other users by defining a policy which, as far as possible, avoids the problems of conversion but does not put the Commission (or any other user) in a situation where he is a captive client of whom advantage can be taken.

PROCUREMENT POLICY

6. Regular invitations to tender will be issued covering additional equipment and services as well as replacement of equipment at the expiry date of contract. These invitations to tender will not only address potential suppliers but also allow present suppliers to improve the price/performance and quality of existing equipment by offering competitive extensions and/or replacements.

7. The criteria for deciding equipment or service modifications/extensions are based on total cost, taking into account:

   - the price/performance of the new installation;
   - the transportability of applications (easy transfer of software from this machine to another, if this becomes necessary) in order to avoid future conversion costs;
   - the cost of conversion to the new installation;
   - the number of people to operate it;
   - the services it provides to the user;
   - the quality of the equipment and associated services (software, support, etc.);
   - the interconnectability to other equipment (does it follow international and European standards);
   - availability of application packages.

   These criteria will not only be covered by invitations to tender but also checked against actual performance, in particular for existing suppliers (vendor-rating).

8. The Commission will also ensure competition between its existing suppliers by making an on-going evaluation against the criteria mentioned under paragraph 7. New or redesigned applications (work for the computer) will not be allocated to a supplier's equipment which does not meet the evaluation criteria satisfactorily.

   This will have the following effect:

   - the manufacturer best meeting the evaluation criteria will have an increasing share of the Commission's business;

   - The manufacturer least able to meet the criteria will have a diminishing share of the market. In fact, at the time an application had to be redesigned, the occasion will be taken to put it on one of the other machines. In the end, this can lead to the phasing out of this particular manufacturer's equipment when its remaining work-load no longer justified its retention.

   As a result of this, the conversion effort to abandon unsatisfactory equipment reaching the expiry date of contract will be reduced to a minimum. Where in spite of the actions taken, unsatisfactory equipment continues to carry applications which are difficult to transfer. the conversion to new equipment will be spread as smoothly as possible over time. This means that the invitation to tender must be issued well in advance of the contract expiry date (e.g. two years for large computers) to allow early start of conversion work, sufficient test time and parallel run on the new equipment. Existing contracts will be extended if this were necessary to complete the conversion exercise.

9. The Commission would therefore:

   - under normal conditions, convert to a new supplier's equipment if the price/performance of existing supplier's equipment (taking into account conversion costs) proved unsatisfactory;

   - avoid being a captive client by ensuring real competition between existing and potential suppliers.

CONCORDANCE BETWEEN COMMISSION INDUSTRIAL POLICY AND PROPOSED PROCUREMENT POLICY

10. Users in Europe (including the Commission) will be forced to adopt such a procurement policy in the years to come. It is right, therefore, that the Commission, as a User, gives a lead to other Users in Europe.

11. This is in complete concordance with Commission industrial policy which seeks to define the conditions of the European market (respect of norms and standards, portability, etc. to permit genuine competition - the interconnection of equipment from different manufacturer, the avoidance of captive markets/customers).

ANNEX III

DATA PROCESSING GUIDE

CONTENTS

ANNEX IV

LIST OF ABBREVIATIONS

CC	Computer centre
CDIC	Commission Steering Committee for Data Processing
CII	Inter-Institutional Committee for Informatics
CTI	Informatics Technology Committee
CU	Users' Committee
CUS	Customs Union Service
DA	Applications Development service
DI	Informatics Directorate
IE	Informatics Engineering Division
INSEM	Inter-institutional Service for Electronic Mail
INSIS	Inter-institutional System of Integrated Services
IPA	Informatics, Planning and Administration service
JCIS	Joint Conference and Interpretation Service
JRC	Joint Research Centre
QA	Quality Management and Internal Audit service
SG	Secretariat-General
SIC	Standard Implementation Committee
SII	Integrated Information Systems Division
SJ	Legal Service
SOEC	Statistical Office of the European Community

ANNEX V

DIRECTORATES-GENERAL

DG I	External relations
DG II	Economic and Financial affairs
DG III	Internal Market and Industrial Affairs
DG IV	Competition
DG V	Employment, Social Affairs and Education
DG VI	Agriculture
DG VII	Transport
DG VIII	Development
DG IX	Personnel and Administration
DG X	Information
DG XI	Environment, Consumer Protection and Nuclear Safety
DG XII	Science, Research and Development
DG XIII	Information Market and Innovation
DG XIV	Fisheries
DG XV	Financial Institutions and Taxation
DG XVI	Regional Policy
DG XVII	Energy
DG XVIII	Credit and investments
DG XIX	Budgets
DG XX	Financial control