**CAP GEMINI SOGETI**

1979 ANNUAL REPORT

# CONTENTS
## OF THE 1979 ANNUAL REPORT

There is no doubt that the closing year of the 1970-1979 period provides us with more incentive to prepare for a fresh and promising decade than to look back nostalgically over a past bearing the imprint of a job well done.

There are many reasons for this feeling; two of them, however, would seem essential:
● the first is the large volume of business being handled by computer service companies worlwide — 19 billion dollars'worth in 1979 — and the reality reflected by this volume: these companies have become the natural and esteemed partners of users of data processing resources and of hardware manufacturers.
● the second, better-known reason is that the technologies of microelectronics and telecommunications are opening the way toward apparently-limitless expansion in the use of data processing, thus confronting both users and service firms with a twin problem: how to make the best use of the new technical resources now available, and how to succeed in designing the software necessary in order not to brake this spread of information technology.

For CAP GEMINI SOGETI, the most important thing is not that it achieved satisfactory results between 1970 and 1979, but that it is tackling the 1980-1989 period with a new organization, designed to facilitate fresh development and endowed with the necessary technical, financial and managerial resources.

The first part of this Annual Report has been constructed to introduce the new applications made possible by modern techniques in selected, particularly significant sectors, as well as the work already carried out by CAP GEMINI SOGETI for the implementation of these applications.

These sectors are the following:

The second and final portion of this 1979 Annual Report provides a wrap-up of the year's results, and of CAP GEMINI SOGETI's organization and human resources at the dawning of the '80s.

In this section, the reader will find:

# LETTER FROM
# THE EXECUTIVE CHAIRMAN

Taking advantage of a quiet year whose results promised to match up to forecasts, CAP GEMINI SOGETI undertook a far-reaching restructuring of its French activities during 1979, an operation whose most significant effects are today:
• consolidation of its French «software services» activities into two companies, instead of the previous five,
• transfer of responsibility for management (and a majority of the capital) of Groupe Bossard to a new team of managers. These are the two most striking events of 1979 for CAP GEMINI SOGETI, concerning which I believe it useful to add some further observations:

## SOFTWARE SERVICES FRANCE

The structure adopted in France for CAP GEMINI SOGETI's «software services» activity in 1974 was a direct offshoot of the merger of CAP and SoGETI, at a time when these two companies had combined French revenues of about 100 million francs and an average workforce of 800. In 1980, these same «software services» revenues are projected at 320 million francs, with a workforce of 1,600: it is easy to understand that a given structure must be completely transformed when the volumes on which it has been based double or triple in magnitude. But this purely mechanical reason was accompanied by a number of others, notably the fact that the market has changed considerably over the past five years: it has developed - and we have developed apace - and, above all, it has become diversified. It should be remembered that there was not even a mention of «office automation» back in 1974; that the upcoming revolution in the distribution of services fomented by the use of satellites was anticipated only by a small circle of insiders; that minicomputers and microcomputers had not yet invaded the market to the extent that both manufacturer' industrial strategies and the expression of users' needs were turned upside down; that no one yet imagined that, on some not-too-distant day, hardware would represent only 20%, 10% or even 5% of a user's total data processing spending; that certain prophets were saying - sometimes at the risk of recanting their earlier prophecies - that we would soon be faced with a glut of data processing professionals, and so on. Measure the path travelled in five years: five short years, at the end of which we have considered it both necessary and healthy to recast the structures inherited from a situation having undergone so much change, i.e., to concentrate our forces in two companies specialized by market*, big enough:
• to place either one among the largest French computer service companies (CAP SOGETI SYSTEMES alone will number nearly 1,000 employees at the end of this year)
• to provide them with the resources to individually undertake the major investment needed by service companies for adaptation to a changing market and to the new tasks requested by their customers,
• to enable them to independently assume responsibility for the increasingly-numerous large projects coming their way in France and abroad.

Given the go-ahead in october, this new organization commenced operation on 1 january of this year; three months later it already appears that the risk taken - because it is a daring feat, sometimes accompanied by certain hazards, to make changes in a smoothly-running organization without being by any means obliged to do so - was worth it, and that the two new companies form a genuine «structure of development» for CAP GEMINI SOGETI. Thanks go out to those - too numerous to be mentioned here by name - who have redoubled their effort during the past six months to make this reorganization a success.

## GROUPE BOSSARD

A number of measures were agreed upon at the time we joined forces with Messrs. Jean and Yves Bossard, application of which was to facilitate cooperation between two activities looked upon as irreconcilable but which we, on the contrary, considered extremely complementary: management consultancy and computer services. It quickly became apparent, however, that Groupe Bossard was more concerned with resolving its internal contradictions («generation gap», conflict between its two main activities of organization and advertising, etc.) than with developing its synergy with CAP GEMINI SOGETI, whose entry into the picture had the primary effect of a catalyst and which, last january, was the helpless onlooker to a sedition which snatched the holding company's management consultancy subsidiary, Bossard Consultants, from its control. This is why, at the end of complicated proceedings whose ends justify the laborious means employed, CAP GEMINI SOGETI decided to reduce its investment in Groupe Bossard from 51% to 48%, but this in a completely transformed Groupe Bossard where:
• the holding company would have 100% control over all of its subsidiaries (including Bossard Consultants),
• capital would be increased from 1,7 to 10 million francs,
• the average age of the management team would be virtually halved,
• the remaining half of the capital stock would be held by managers who had proved themselves in the leadership of Bossard Consultants: Jean-René Fourtou, Jean-Pierre Auzimour, Georges Goury...

We are many who believe - now that all of this has actually been set up - that opportunities for cooperation and synergy are far more abundant today, when we hold 48% of a rejuvenated, restructured and revitalized Groupe Bossard, than they were yesterday with 51% of an entity whose only claim to being a «groupe» was in its title. The paradox of all this is that I.A.S.C.* standards are such that, if you hold 51% of a company's capital, you consolidate its revenues 100% whereas if you hold 48% you don't consolidate a thing. Thus it is that, at a moment when hopes are highest for cooperation between the two Groups, CAP GEMINI SOGETI's consolidated revenues have lost the 150 million francs that would have enabled it to pass the 600 million mark it had vowed to reach before the end of the decade. Even if this

---

*Public and semi-public sectors, computer industry and software products for CAP SOGETI LOGICIEL, private sector, banking and insurance for CAP SOGETI SYSTEMES.*

---

*International Accounting Standards Committee, whose standards have been adopted and applied by CAP GEMINI SOGETI since 1 january 1977.*

## Summary CAP GEMINI SOGETI consolidated results for fiscal year 1979

|  | US $, in millions |
| --- | --- |
| CONSOLIDATED REVENUES (Bossard excluded) | 113 |
| Gross CASH FLOW | 16.2 |
| NET INCOME after taxes | 5.5 |
| SHARE CAPITAL AND RESERVES | 16.2 |
| TOTAL OF BALANCE SHEET | 73 |
| TOTAL NUMBER OF EMPLOYEES as at 31 December 1979 (Bossard excluded) | 2 725 |
| NUMBER OF PROFESSIONAL STAFF | 2 332 |

CAP GEMINI SOGETI is a group of some thirty computer service companies providing a range of professional services: consulting in the use of data processing resources, developing software that enables corporations and government agencies to make use of these facilities; designing and implementing complex data processing systems; giving assistance to computer operations; training; and doing management consulting.

CAP GEMINI SOGETI also offers computer-based and data entry services, although these operations account for less than 9% of gross revenues.

Active throughout Europe, in the USA and Africa, CAP GEMINI SOGETI is one of the world leaders in computer services.

3

■ The French General
Telecommunications
Directorate plans to issue a
simple terminal, fitted
with a black-and-white
screen, to the 240,000
subscribers in the Ile-et-
Villaine Department. To
be distributed in 1982,
these terminals will replace
the present book-type
directory. If the
experiment is a success,
this electronic directory
will be installed on 4
million subscriber lines in
1985, and 30 million in
1992. The economic
justification for an
investment of this scope
lies in the fact that the
cost of producing a paper
directory rises as the
square of the number of
subscribers: if it doubles, the
directory will be twice as
thick, and it will have to
be distributed to twice as
many telephone users.

## INFORMATION DISTRIBUTORS

The «distributor», tasked with dissemination of information and connection of users to the system, is the link between the information user and the information provider.

CAP GEMINI SOGETI has performed a study to classify these distributors, ranking them by manufacturer, language, application type, sector of activity, etc.

This classification drew a distinction between three classes of information distributor:

• *small distributors*
While obviously the most numerous, these are also the most difficult to sensitize to new information techniques. Examples are small businessmen having little information to be made available to users, with a consequently low information throughput. The hardware and software system installed must therefore be highly integrated and inexpensive, and the traffic generated will remain local in scope.

• *medium-size distributors*
This will represent a sizeable body of distributors in the long term (some tens of thousands in Europe). In this case, we are talking about organizations still having a relatively modest volume of pages of information (between 300 and 10,000 pages), with simultaneous processing of only a few dozen communications. Municipal administration, local tourist boards and shopping centers are representative of this class.

• *large distributors*
Naturally, these are relatively few in number: major corporations, government agencies and computer service companies wishing to provide joint distribution services for multiple information providers (several hundreds of installations). The number of simultaneous communications is also substantial: of the order of one hundred. Heavily centralized or networking computer systems are a must.

## STAR

Developed at the Joint Television and Telecommunications Research Center (C.C.E.T.T) in Rennes, STAR is a set of modules designed for distribution of a very wide range of professional or consumer VIDEOTEX information, permitting consultation by a large number of subscribers (up to 600) simultaneously.

Now an industrial product, STAR is being marketed by CAP GEMINI SOGETI.

## THE MULTITEL RANGE

CAP GEMINI SOGETI has developed a range of products christened «MULTITEL», intended for large and medium-sized providers of information for distribution over broadcast VIDEOTEX. This range, developed in the Northwestern French city of RENNES, matches the ANTIOPE standard both in terms of transmission procedure (it incorporates a multi-service protocol for access to multiple information providers) and in terms of screen definition and format. Thanks to a multi-microprocessor architecture, MULTITEL offers upward compatibility for future hardware and software installations.

This product range provides a solution to match the needs both of non-computerized information providers and those already equipped with conventional DP hardware: in the latter case, MULTITEL takes over all specific VIDEOTEX processing operations, leaving the existing hardware to handle the dedicated application.

## INDIVIDUAL INFORMATION TECHNOLOGY FOR LEGISLATORS

A country's inventory of accumulated legal texts makes the «truth» - in the eyes of the law - a complex and evasive phenomenon: neither human reason nor human memory can keep it in their grasp. Nonetheless, many individuals must have access to the entire corpus of laws, beginning with those who actually make them: a nation's legislators.

CAP GEMINI SOGETI had these people in mind when it developed a professional VIDEOTEX system based upon the Group-developed MULTITEL architecture.

An experimental system is currently installed in the Dutch province of Limburg. The system supports about 500 «pages», accessible via three VIDEOTEX terminals and a compositor's terminal. It permits the retrieval of legal texts by date, author's name or subject. As a bonus feature, it provides information on the province's economic, cultural and social life.

Following the experimental phase, this system may be expanded to cover all of the laws of the province, with access from a larger number of terminals.

# THE COMPUTER IN THE HOME

One of the basic products of today's revolution in electronic information handling has already reached the stage of industrial development: the household computer terminal, standardized and - like the ubiquitous TV set - blended into the living-room decor, providing any household with direct access to a formidable array of databases.

«Broadcast VIDEOTEX» is already operational in Great Britain and France. In the latter country, for example, «ANTIOPE-BOURSE» broadcasts daily stock market quotations for stockbrokers (and, incidentally, for viewers of TF1, one of France's nationwide television channels).

«Interactive VIDEOTEX» (or TELETEL), launched by the French Telecommunications Authority, is soon to become a reality in the form of two pilot operations:
• the «Velizy experiment», in which 3 000 households will be equipped with terminals, enabling them to consult databases and perform transactions with some 200 public and private information providers.
• the «Electronic Directory», for which dedicated terminals will be issued to all 240,000 telephone subscribers in the Ille-et-Vilaine Department in 1982, allowing them to access the telephone information service, and subsequently other TELETEL services.

For many applications and for many businesses, VIDEOTEX is nothing more than a simple technical development which in no way implies any need for organizational change; after all, it is already possible to book a passage or order a refrigerator from a mail-order house with a mere telephone call. In such cases, VIDEOTEX only simplifies the operation and enhances the quality of service, even if the fact that it can take further steps already constitutes a meaningful evolution vis-à-vis the present system.

But VIDEOTEX is also going to encourage the development of new activities, and particularly the *sale of information,* whether economic, technical, legal or tourist-oriented. For it solves the main problem encountered by the promoters of these activities: the distribution of information. «Interactive VIDEOTEX» provides an effective solution to the problem of information transport by routing it to its end users at a reasonable price; in turn, optimum use of this information is assured by providing these users with free access to the host data banks.

From the technical standpoint, VIDEOTEX is more an evolution than a revolution. It makes use of the existing telephone infrastructure and the data transport network, and is workable only because increasingly numerous and powerful computers have been installed by companies which have gradually learned to master electronic information systems.

The true revolution lies in:
• *the collapse of prices*: the prototypes for the terminals used in France's Vélizy project cost about FF 20,000 each. Production-run Vélizy terminals will cost about FF 3,000, and the cost of the mass-manufactured «telephone directory» terminal should not exceed FF 500.
• *the diversification of consumer-type electronic information hardware*, such as facsimile machines, magnetic card readers, videodisk units, etc.: all of this equipment, whether in combination or in competition, is contributing to the take-off of personal information technology.
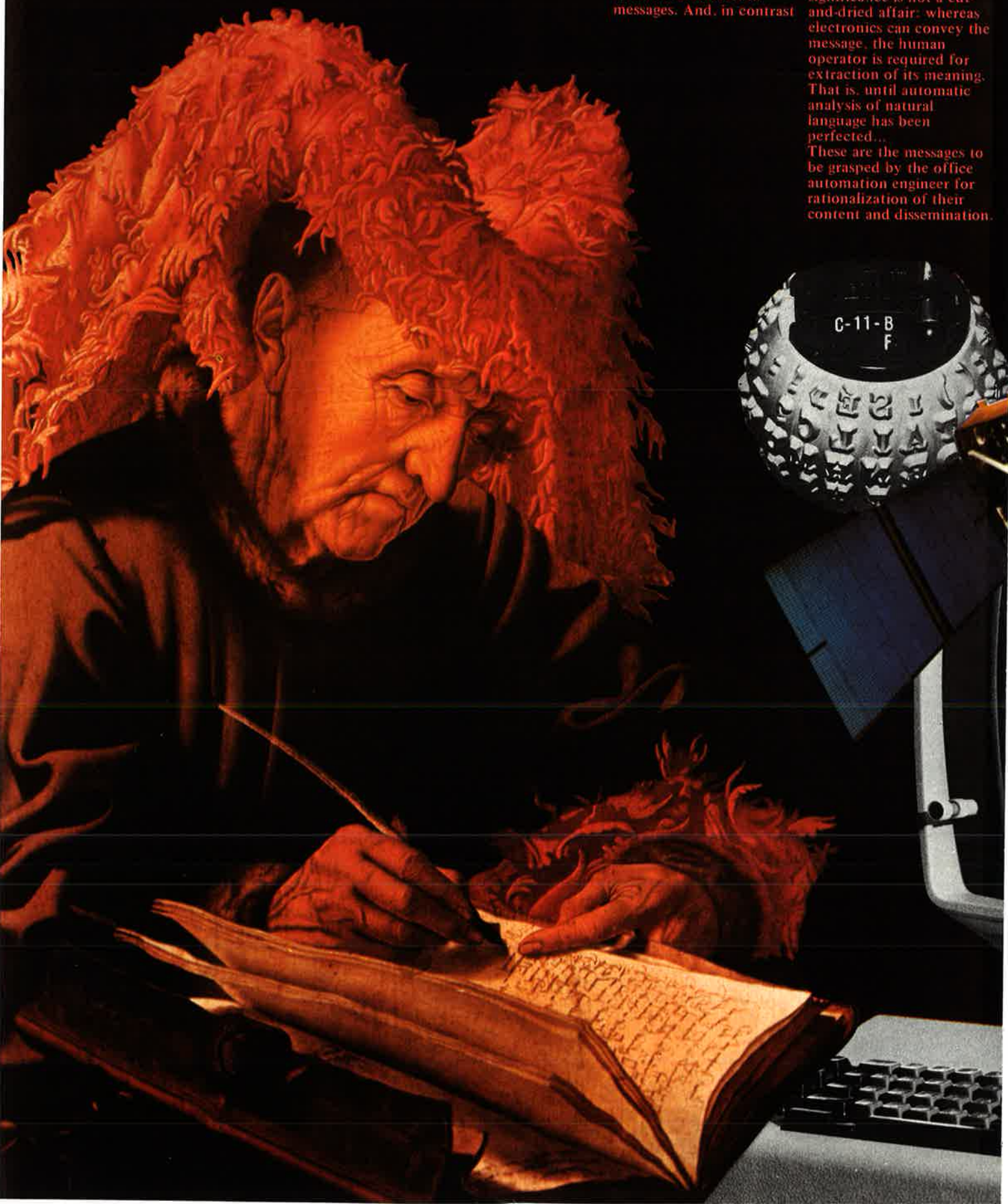
With regard to users, it must be acknowledged that they have readily assimilated the pocket calculator, the bank cash distributor, mass-transit ticket vending and validating machines, video games, etc.: the bet is on that the same will hold true for VIDEOTEX.

The main thing, however, is the fact that the user will be able to converse with that tireless, endlessly-patient interlocutor: the computer. He will no longer be ashamed of his relative ignorance. At the risk of contradicting certain long-standing prejudices, it might even be suggested that, in the long run, man-machine dialogue will improve interpersonal communication, simply because it will help establish better foundations for this exchange.

■ Ninety percent of all office information circulates in message form (with «message» - oral or written - taken to mean a set of words, figures, phrases or paragraphs). Alphabetic characters clearly predominate over numeric characters in messages. And, in contrast to the areas handled by data processing, we encounter here every element of the wealth of natural language: redundancy, «filler» context-determined meanings, etc. Grasping of the information's significance is not a cut-and-dried affair: whereas electronics can convey the message, the human operator is required for extraction of its meaning. That is, until automatic analysis of natural language has been perfected...
These are the messages to be grasped by the office automation engineer for rationalization of their content and dissemination.

## SIP: OFFICE AUTOMATION PRINCIPLES APPLIED TO SOFTWARE DEVELOPMENT

The exponential growth of software requirements foreseen in the coming decade makes improvement in the productivity of software development one of the most important goals placed before the Western nations.



Designed by CAP GEMINI SOGETI, SIP takes a significant step in this direction, applying the principles of office automation.

SIP is an integrated combination of hardware and software organized around a workstation from which the programmer has direct access to the instruments and tools he needs, such as display screens, diskette units, written documentation, program debugging software, documentation software, etc.

Thanks to the convenience of its working environment and its automated methodology, SIP offers the following advantages to data processing professionals and users:
• a substantial reduction of development time, as a result of the immediate availability of all information concerning the software under development on a data processing medium,
• systematic generation of high-quality documentation,
• efficient project supervision, thanks to the permanent visibility of the actual state of progress of project documentation and programs.

## METHODS FOR INSTALLATION OF TEXT PROCESSING SYSTEMS IN GOVERNMENT AGENCIES

The increasing volume of texts to be handled, combined with forceful sales operations by hardware manufacturers, threatens to lead to relatively inefficient use of text processing equipment reminiscent of the halcyon days of data processing itself.

To avoid this sort of situation, the French Ministry of Industry's Data Processing Technical Center has decided to develop a method for design and implementation of text processing systems. CAP GEMINI SOGETI has defined the successive stages of the study, and has drawn up a guide for analysis of requirements leading to system selection.

The parameters examined in this guide are:
• nature and volume of texts handled by the agency,
• basic, machine-independent processing operations performed on these texts,
• relationships between processing operations and text-description information.

This method will permit a better match between text processing systems and users' needs, and more efficient use of the resources provided by the systems.

Obviously, however, this method is not applicable only to government agencies; it is of interest to any organization called upon to process a high volume of texts, whether in the industrial or service sector.

## TOMORROW'S OFFICE

The individual in charge of an office - whether manager, executive or technician - stands at the center of a sometimes-diffuse mesh network in which information is circulating in all directions and in all forms: letters, notes, reports, graphs, telex and other messages, exchanges during meetings, and so on.

As defined by the Association Française pour la Cybernétique Economique et Technique (AFCET), office automation « is the science of the individual information system as used to carry out all tasks of an administrative nature. Under this definition, office automation includes text processing, telecommunications, organization and modelling of administrative procedures, automated filing and archiving of documents and, generally speaking, all factors included in the logistics of the office and its environment».

The basic component of the «office of the future» is beginning to make its appearance on the office scene: the text processing machine, consisting of a display screen, a keyboard, a magnetic memory unit, a printer and a central processor similar to a small computer.

Although most frequently operating in a stand-alone environment, these text processing machines are - thanks to powerful software resources - already capable of communicating with other machines of the same type, or with all kinds of office equipment, such as photocopiers (and communicating directly, too, i.e., without an intervening paper «original»). They may also be connected to phototypesetters for generation of printer's proofs, or to machines which generate microfilms or microfiches, or to facsimile machines.

This gradual interconnection of machines which are still being used to perform separate, isolated functions within the office environment will terminate in the establishment of an automated office network destined for the office of the future. What is in store for tomorrow's office?
• electronic mail, with documentary retrieval, will permit automated, selective dissemination of information to users, eliminating the time lag for transmission of «hard copy».
• teleconferencing, with remote duplication of texts and graphic materials, will systematically free participants of the constraints imposed by distance, with exchanges becoming increasingly impromptu in nature.
• expansion of the videotex service will provide immediate access to numerous databases, which require tedious search when using today's conventional methods.
• satellites will make their contribution to a global business communications service, not only for telephone links between distant establishments, but also for high-speed facsimile, video teleconferencing, teletext and high-speed digital data transmission.
• work in the home will soon become an available option, as there is no technical obstacle to keep the network's node (i.e., the originator of the information) from shifting activities from his usual office to his residence.

Manufacturers under pressure to produce and market in volume will often find it advantageous to turn to independent service companies, experienced in hardware and software design and familiar with corporate mechanisms and customs. Likewise, users eager to modernize would be well advised to profit from the experience acquired by the major service companies in data processing management applications. Technological resources will thus serve to enhance the quality with which the human potential in our offices is used, free of useless collision and conflict.

## THE ELECTRONIC PAYMENT SYSTEM

*As illustrated here, specialized terminals linked to the banking system through a data switching network allow financial transactions to be made without using the present means of payment.*



Central bank

Clearing system

Bank A

Bank B

Bank C

TRANSPAC

| Automatic teller windows | Home terminals | Point-of-sale terminals | Financial terminals |
|---|---|---|---|
| Individual customers | Individual customers | Consumers and distributors of products and services | Corporations |
| Is helping major banks carry out experiments in provision of automatic teller windows enabling individual customers to perform ordinary banking transactions by themselves: withdrawals, checkbook ordering, etc. | Is investigating home information services that banking institutions can deliver to customers, and provides banks with videotex systems for preparation of the necessary infrastructure (see page 4 for information on videotex product lines). | Is implementing an experimental system ensuring the confidentiality of credit-card recognition algorithms for a financial institution. These cards, accepted by merchants, department stores or directly at the bank's own branch offices, offer a high degree of protection thanks to an identification system unintelligible to a potential swindler. | Is designing functional specifications and analyzing the impact of installation of financial terminals on existing corporate data processing systems. |

# TOMORROW'S BANK

Always a jump ahead of the facts, the media are beating the drums for the advanced applications of data processing in the banking field. There is endless talk about electronic funds transfer, automatic teller windows, point-of-sale terminals, living-room transactions and so on. There is special reverence for Japan and the United States, where spectacular achievements are said to be made in this area. But all of this overlooks the fact that showmanship and efficiency are not inseparable partners.

Take electronic funds transfers, for example: these systems were first viewed as a necessity, on the macroeconomic level, for acceleration of inter-bank exchanges on the verge of paralysis. Initially, electronic movements of funds involved only large aggregate sums which, although exchanged between banks in relatively small quantities, required high-speed processing procedures. The subsequent appearance of new, fully-automated methods of bulk payment rapidly forces banks to set up new inter-bank processing centers, capable of handling high information throughputs and operating as true message switching centers.

In France, for example, installation of «clearinghouse computers» certainly takes its place among the most remarkable achievements in the field of inter-bank data processing. Another success has been the creation of Carte Bleue processing centers, which will be significant links in future electronic payment systems. Still in France, the leading banks are completing the installation of branch-office terminal networks which are substantially accelerating the recording of operations, while increasing their security.

Designed and based in Europe, the SWIFT network - operational since 1977 - links up 500 of the most important European, North American and Japanese banks. It implements funds transfers to cover international trade operations, to repatriate earnings and capital invested abroad and so on. These achievements are already making use of the most sophisticated techniques available; what is holding them back today is more a matter of market demand than potential for innovation.

The physical exchange of checks in clearing houses will soon be replaced by the mere passage (via the clearing computer) of their magnetic images; this will certainly constitute a decisive forward step in the development of electronic funds transfer, opening the practical path to electronic payment systems.

Also, continuing research into new customer services has already resulted in promising experiments:
● automatic teller windows permitting cash withdrawals, inspection of balances, transfers between an individual customer's accounts, cash or check deposits, etc.
● financial terminals enabling businesses to improve management of their funds, thanks to a more refined, «real-time» knowledge of their cash situation.
● terminals in department stores for recording of customer payments.

It is thanks to the banking profession's continuing concern for progress that its institutions are able to take advantage of new technological possibilities such as the improvement of database management techniques, the operation of information-conveying networks, the development of microprocessors capable of creating «smart» remote terminals, etc.

And innovation is not about to stop there: the credit card with built-in microprocessor - a veritable «theft-proof billfold» - is already in the experimental stage; and videotex is soon to undergo large-scale experimentation in ordinary homes, initially enabling subscribers to obtain personalized information from their banks, and subsequently to perform certain transactions from their living-room terminals.
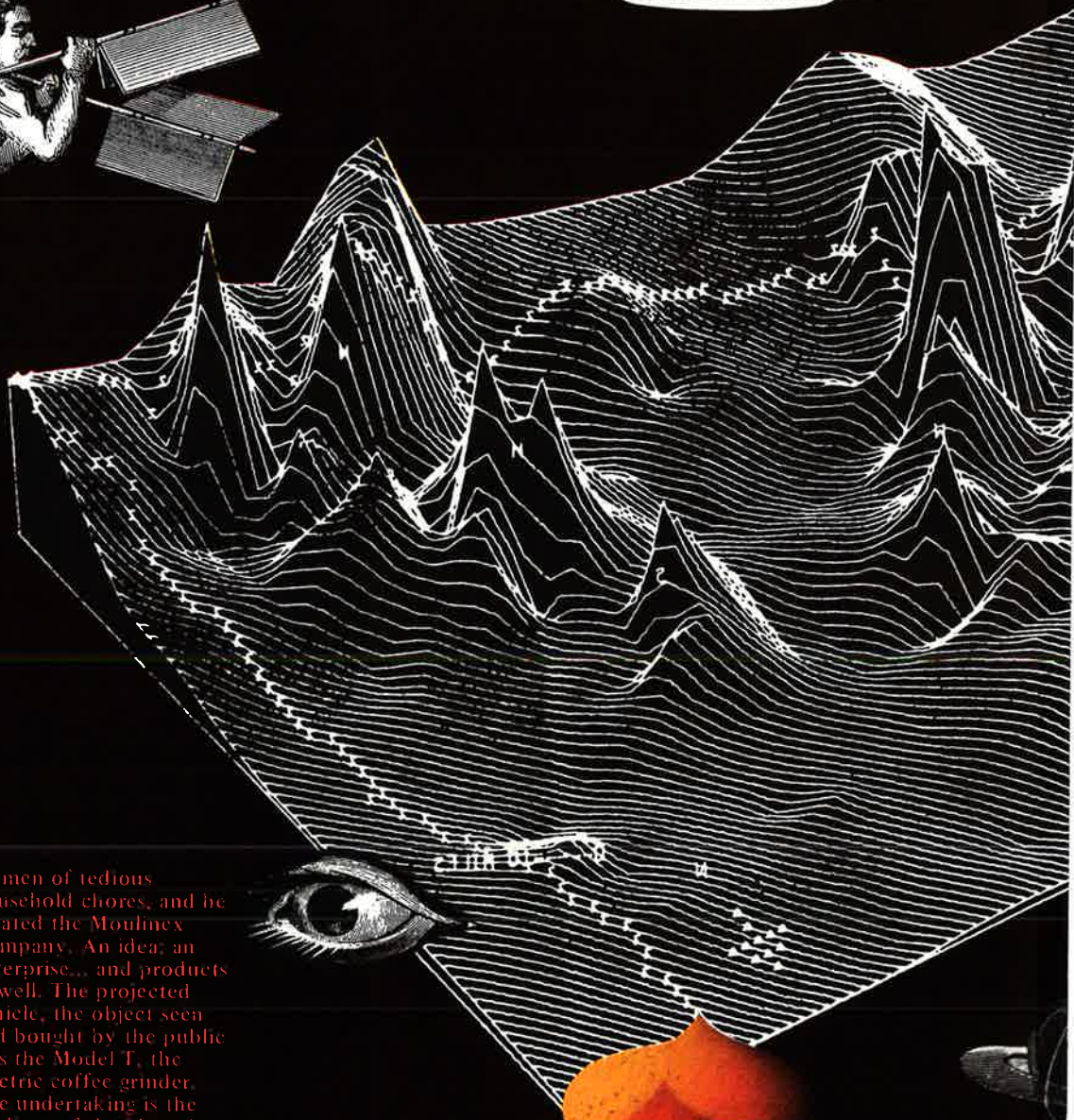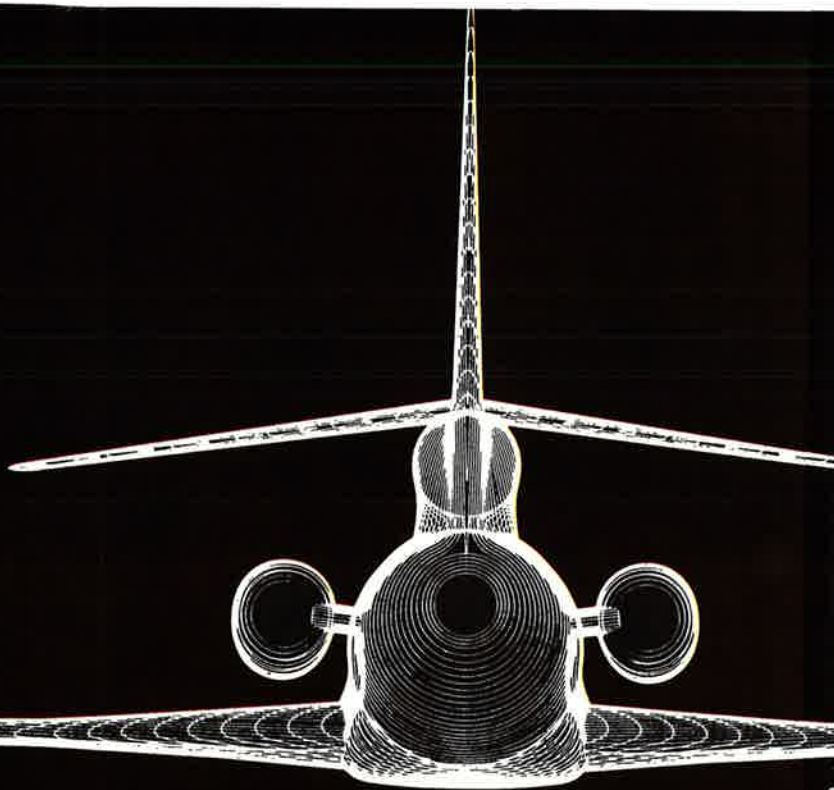
■ Open a dictionary to the word «enterprise» and you'll find: «Execution of an idea». In other words, an enterprise is a project which has assumed concrete form.

Thus Henry Ford had the idea to «build a car for the masses», and created the Ford Motor Company, to carry it out. It was Jean Mantelet's plan to free women of tedious household chores, and he created the Moulinex Company. An idea: an enterprise... and products as well. The projected vehicle, the object seen and bought by the public was the Model T, the electric coffee grinder. The undertaking is the medium of the idea; the product, its consummation.

André TEISSIER DU CROS

*The Earth isn't always easily recognizable in satellite-transmitted pictures, and millions of television viewers have faced the problem of making out the continents beneath a veil of clouds and of picking out familiar points in order to get their directions straight. The computer, however, makes corrections for the chromatic aberration of the Earth's atmosphere, turbulence and errors of perspective, and the photo is overlaid on a world map outline, easily recognizable by everyone with the rudiments of elementary-school geography.*



*Certain problems raised by freeway routing (estimate of cut and fill cubage, the famed evaluation of the optimum profile for a curve, limitation of shoulder slopes, matching of profiles and vehicle speeds, etc.) involve long and tedious calculations. Their solution under CAD enables the operator to «drive» that stretch of roadway and judge exactly how it has integrated the requirements that he himself has indicated. This puts the designer in a position to make detailed modifications in this project, avoiding expensive changes on the construction site.*

# INDUSTRIAL DESIGN AND DEVELOPMENT

«As a rule, the drawings required for the design of a ship, for construction of its hull and superstructure, weigh as much as the ship itself». This is obviously stretching things a bit, but is perhaps more expressive than any sales pitch in explaining industry's enthusiasm for the new techniques of Computer-Aided Design (CAD).

The design engineer now has a new working tool: the interactive graphic console hooked up to a CAD system. In this configuration, the console's screen takes the place of the drawing board, while the light pen replaces the drafting pen and ink eraser.

The characteristics of the object under development - whether machine part or electric diagram, civil engineering structure or aircraft hull - are stored in the computer memory. The object can be instantaneously displayed on the screen, in any requested form (projection, reduced section, perspective, etc.) by means of a command entered on the keyboard.

Using an evaluation program, the designer compares the technical characteristics of the object which he has just defined, calculated by the computer, with a set of target characteristics. If the results are not satisfactory, he changes certain parameters and repeats the process as many times as is necessary. In just a few moments the computer will have solved his calculation problems, whether for structural design, fluid flow, matching of two profiles for assembly and so on.

The system then automatically prints out the corresponding detail drawings on a plotting table, together with instructions required for actual implementation of the part or the design. In the case of a part which is to be machined, the system will directly supply the tape which will drive the numerical-control machine tool.

Behind the material components of a CAD system (graphic devices for information entry and retrieval, computers for calculations and picture handling), a highly sophisticated software array activates the functions implicitly called by the operator:
• pattern management and storage in a library through which the designer may browse at his convenience, supplementing a design or making use of already-catalogued intermediate structures,
• interactive graphic screen display, meeting the laws of perspective and the standards of industrial draftsmanship while indicating external constraints (supports, interfaces),
• application of calculations to the components described (fluid flow, tensor calculations of strength, volumes of materials to be employed, machining tolerances, etc.). Obviously, this latter portion of the software is specialized for individual branches of industrial design.

Besides the tool offered by CAD, the design engineer will soon also enjoy immediate, inexpensive access to technical and scientific data banks. Impressive resources are currently being poured into the rational distribution, via data communications networks, of the virtually-inexhaustable supply of existing technical information.

Beyond their purely quantitative aspects - increases in productivity - the essential advantage offered by these new techniques lies in the design of products which are better matched to requirements. These techniques make it possible:
• to improve the quality of the product under design, through a more extensive investigation of variants and higher reliability in transmission of information between the various technicians involved,
• to generate active participation by customers or marketing managers during actual development of products, (e.g., footwear, textiles, glassware, etc., particularly when esthetic factors are involved),
• to rapidly adapt or transform an existing product to meet a special demand.

Both data banks and CAD are already available as springboards to modernization, and they will become a significant competitive factor in the hands of the most dynamic manufacturers.
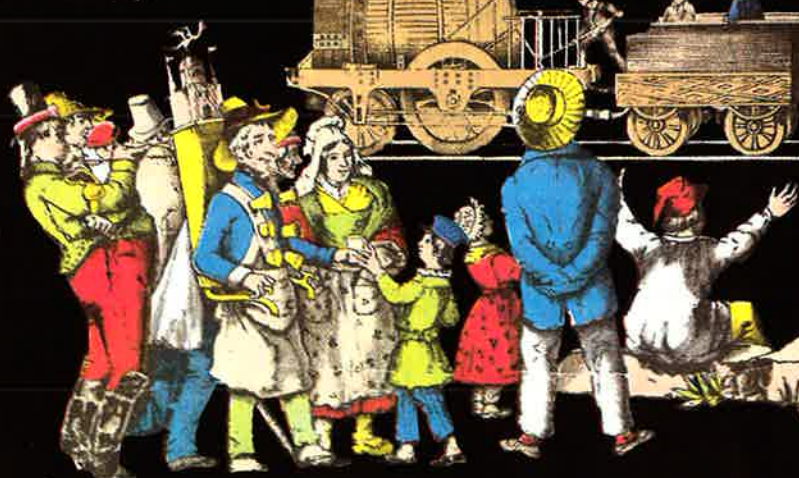
### THE ELECTRONIC TOURIST-INFORMATION SERVICE (STT)

The French General Telecommunications Directorate has entrusted CAP GEMINI SOGETI, in partnership with Télésystèmes, with the promotion of the new Electronic Tourist-Information Service (STT) and with the definition of the distributional structures between providers of services, public agencies and travel agents.

The great value of the service soon to be offered to travel agencies by STT lies in the possibility of access to multiple reservation systems from a single terminal. A switching system will adapt the various procedures between the TRANSPAC network and the reservation system offered by air, sea and rail carriers, travel organizers, rent-a-car firms, regional tourist reservation centers, hotels, tour operators, etc.

The range of services offered to system users covers all of a travel agency's sales and management requirements:
• reservation, on all connected reservation systems,
• issue of tickets,
• recording of information for immediate or off-line processing,
• management of the agency itself for which CAP GEMINI SOGETI has developed an invoicing, accounting and statistical processing system.

This system has already met with lively interest among travel agents, who view it as a means towards diversifying their suppliers; simplifying and standardizing their procedures; integrating and automating their management routines.

Subsequent expansion of this service will follow three major thrusts:
• new leisure and tourist organizations will be connected to STT,
• geographical coverage will expand to France's neighbouring countries by means of EURONET and telecommunications satellites,
• new facilities will be offered to users: for example, plans already call for development of a common reservation language which will greatly simplify the work of travel agencies.

The members of the leisure and tourist industries have been compelled to optimize management of their resources in order to keep abreast with ever-growing demand and competition. Carriers and hoteliers have thus been faced with the task of simultaneously cutting down on expenses, obtaining exact information on space availability, reducing overbooking and offering improved service to their customers.

Historically, the big air, sea and rail transportation companies were the first to equip themselves with centralized systems, specifically designed for their space-reservation requirements.

Directly or indirectly, these carriers subsequently expanded their activities to related services (e.g., hotels, car rentals, etc.), but quite naturally applied their original reservation systems to these new services, if only to improve the profit ratios of their data processing equipment.

Today's falloff in hardware costs, the availability of domestic communications networks and the substantial effort invested in reservation-system software now enables small and medium-sized companies to gain access to systems comparable to those used by the major carriers. This potential for expansion is far from negligible in light of the fact that, even today, barely 15% of air carriers have their own reservation systems. This is not the only possible area of expansion:
• reservation systems are being used in an ever-increasing number of fields: the entertainment industry (theater and movie seat reservations), accommodations in vacation villages or tourist resorts, convention centers (conference-room reservations), shipping (freight, containers) and even real estate (allocation of apartments, building sites, etc.).
• the diversification of reservation systems, each with its array of dedicated terminals, makes the need for a further step obvious. Currently being undertaken in France, this phase involves the generalized use of compatible terminals and the possibility of connecting them to multiple reservation systems: this development has been made possible thanks to the «microprocessor revolution» and the existence of public transmission networks.

The presence of a single terminal with access to multiple reservation systems on a travel agent's counter will thus enable him to offer his customers a more comprehensive service, including - for example - flight, hotel, theater, car rental and restaurant reservations, producing the tickets to go with them. Agencies will also be able to computerize their own internal management using the same data processing resources.
• this tool is usable only if accompanied by a single language for dialogue between the operator and the entire range of systems accessible from his standardized terminal. Development of such a language is currently in the project stage in France, where the establishment of a nationwide service will make it feasible and profitable.

In any case, promoters of new services will have to make sure that each of these techniques will also go to strengthen and facilitate the agent's fundamental role of «consultant» to the person at the base of this pyramid: the customer.
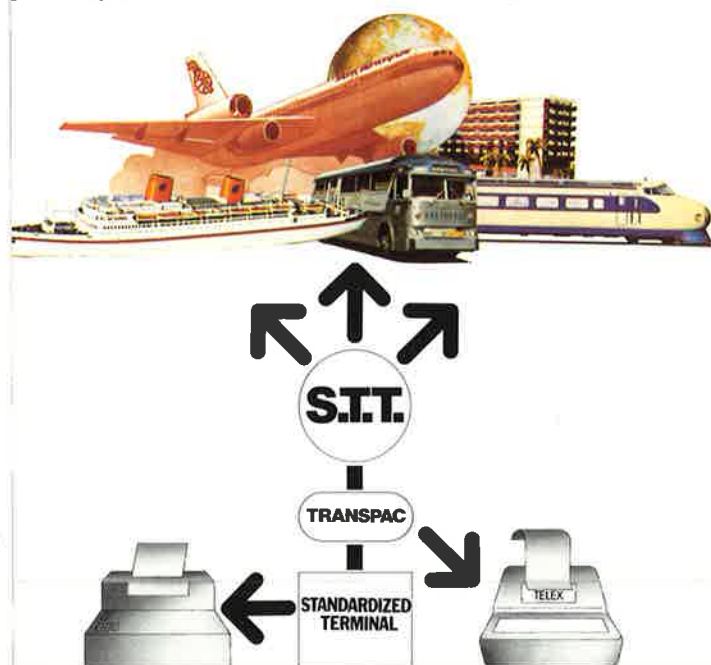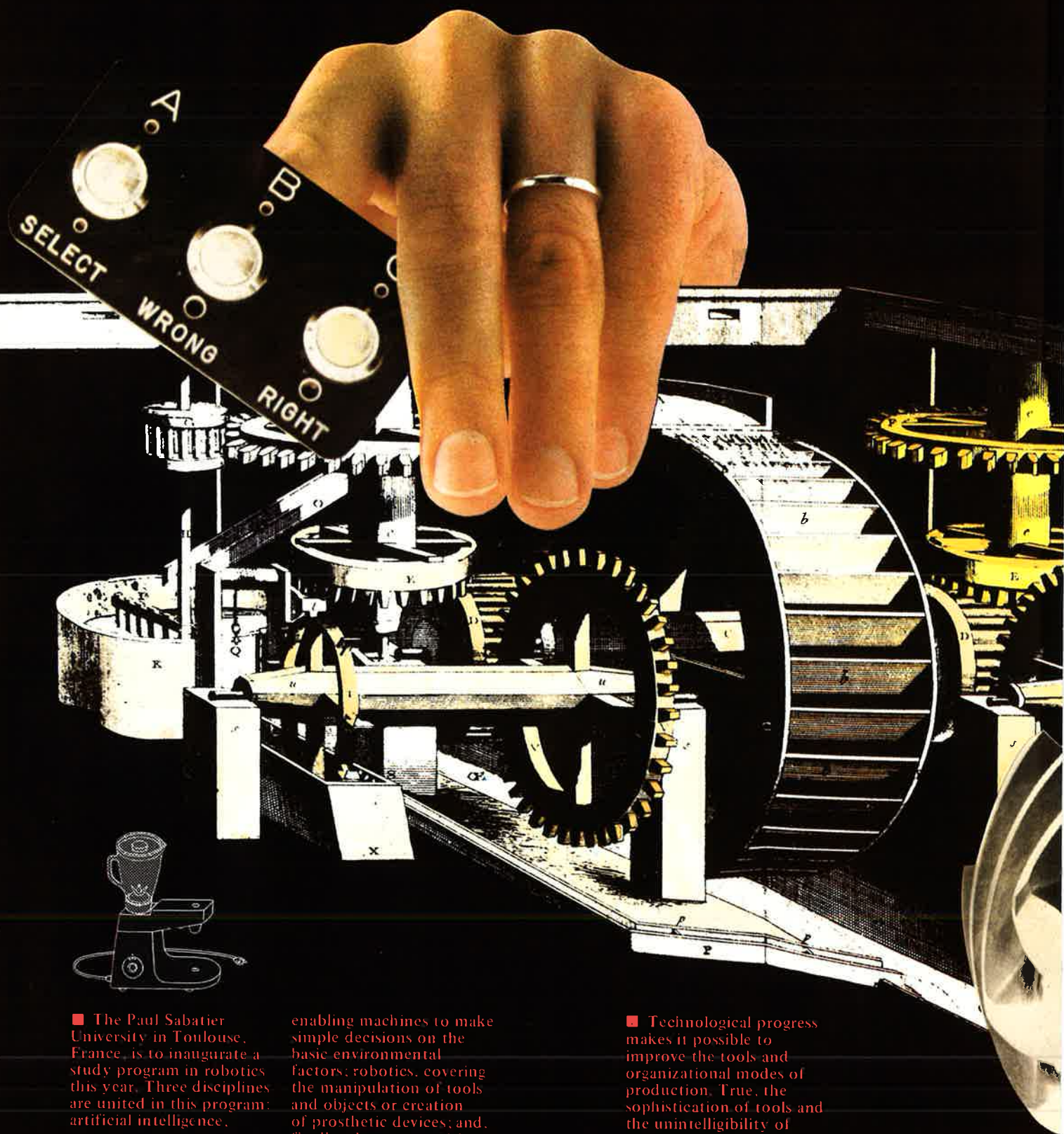
■ The Paul Sabatier University in Toulouse, France, is to inaugurate a study program in robotics this year. Three disciplines are united in this program: artificial intelligence, enabling machines to make simple decisions on the basic environmental factors; robotics, covering the manipulation of tools and objects or creation of prosthetic devices; and, finally, shape recognition, by which robots are fitted with tactile sensors, sensitive skins or television cameras. The one-year program is open to students holding a master's degree in a related field, and successful completion is rewarded by award of a regular French university diploma.

■ Technological progress makes it possible to improve the tools and organizational modes of production. True, the sophistication of tools and the unintelligibility of manufacturing processes may lead to the appearance of new Taylorisms, if care is not taken. It is necessary to sidestep these flaws and take advantage of innovations. Correctly exploited, they constitute a lever central for improvement of working conditions.

From «Options of the Eighth Plan», issued by the French government.

## PRODUCTION CONTROL

A British automobile manufacturer is developing an automatic testing system - the first of its type in the United Kingdom - to investigate the performance of its trucks without driving them out of its new assembly building.

CAP GEMINI SOGETI's British subsidiary is participating in development of the software for this system, which will be supported by two computers:
• one will process measurement results, delivered in analog form by the driving test rollers and dynamometers,
• the other will integrate test results, processed in digital form, to feed a database and permit detailed real-time use of this information.

This system creates an accelerated vehicle test on an «artifical highway», and should yield a rapid enhancement in production of main vehicle components.

## ENGINE TEST PLATFORMS

The Belgian subsidiary of CAP GEMINI SOGETI, working in cooperation with an engineering firm, has implemented a real-time data acquisition system on twelve engine test platforms for a manufacturer of special vehicles. This system, making use of a microprocessor and a conventional minicomputer, shows engine operating states on a display unit.

Entry of all significant parameters, such as speed, temperature of mechanical parts and fluids, fuel consumption, power, etc., provide a better understanding of the thermal and mechanical phenomena in action at various engine operating speeds.

This more refined, scientific knowledge is resulting in significant improvements in engine ruggedness and performance.

## QUALITY ASSURANCE IN THE SANDVIK PLANT

Fabrication of cemented carbides for industrial tooling is a complicated and tricky process. The times are gone when thermochemical metallurgical treatment was left to the discretion of shift foremen who estimated duration in terms of hours and metal temperatures by their color.

The need to deliver products with well-defined, reproducible mechanical properties has led Sweden's leading tool steel producer, Sandvik, to turn to the CAP GEMINI SOGETI subsidiary in that country for the design, implementation and installation of a computerized quality assurance system.

The purpose of this system is to guarantee constant finished-product quality, to rapidly detect the causes of any defects during the various production stages and to supply information useable in the development of new manufacturing processes.

The system acquires a substantial volume of data on products before, during and after fabrication, and provides users with ad hoc reports meeting selected criteria.

# THE PLANT OF THE FUTURE

With the '80s just beginning, automation of production is the number one priority target for all new data processing applications throughout the industrial sector. More than a simple economic need, this becomes a veritable necessity for survival at a time when increased competition from low-wage countries requires absolute control over costs in all phases of production.

At the current developmental rate of applications of automation in production, the bets are on that, within a period of 2 or 3 years, the majority of computer «management» experts in the industrial sector will be encountering projects for computer-aided manufacturing, production-tool automation (numerical control of machine tools, with robotics, etc.) or automated production management.

Of course, sometimes-spectacular achievements in the area of automatic production have been operational for many years now. In the process control field, for example, major refineries are equipped with data processing systems which perform a variety of functions:
• simple data monitoring through central acquisition of «on-off» states (remote alarms, remote signalling) and by measurement of physical magnitude: temperature, flow, etc.
• assistance to integrated installation management through the generation of operating directives, derived from sometimes-complex calculations, such as those bound up with quality criteria or a system's operating trend forecasts.
• production control, either by sequencing commands or by adjusting operating setpoints (a particularly useful function during transient or startup phases).
• optimization of operation on the basis of complex calculations, etc.

Production-line automation is also in a very advanced stage today among many auto manufacturers: new production lines are capable of simultaneously producing a number of vehicle types.

Operations are performed by robots, which adapt their movements to the various body types sent down the line; the numerous parts are retrieved from stock and conveyed to the right workstation at just the right time; output differentials between automated lines and manual second-operation lines are absorbed by buffer stocks, huge, multi-story «sorting yards», etc.

In short, the upswing of computerization in production is no novelty in itself. The true novelty in this area may be summed up in two words: integration and popularization.
• *Integration*: beyond the localized automation of an individual manufacturing task, the ultimate objective here is to computerize production in its entirety, from product design to delivery. Naturally, this involves the realm of design (the impact of Computer-Aided Design techniques is pointed out on page 10 of this Report), but also the «methods» department and work preparation (automated determination of manufacturing ranges, for example), manufacturing resources, control systems, workpiece positioning and inter-station transfer operations, quality control, supervision of distribution, etc. Not to mention production management systems which must be adapted for coordination of the new computerized activities.
• *Popularization*: long the preserve of large companies belonging to high-profitability economic sectors and faced with strong international competition, the use of these techniques will gradually filter down to the strata of a much more extensive industrial fabric. This popularization owes much not only to the falloff in prices of required materials, but also to the availability of specific skills developed by the large data processing service and consulting companies.

■ Today's medicine is confronted with an unusual paradox. On the one hand, its prospects for advancement are closely bound up with increasingly-sophisticated technical means for research, for patient surveillance, for transplantation of defective members and organs, for epidemiological research. On the other hand application of these advanced techniques is increasingly taking up the physician's time and attention, to the detriment of the relationship of understanding which he must establish with his patients.

For this relationship - the foundation of dialogue - is indispensable if the physician is to clarify the inductive reasoning which permits him to make a diagnosis by assembling all available information until he has identified a combination analogous to a known set of symptoms.

It is also true, however, that the increasing scope of technical resources for the measurement of physiological parameters is tending to encourage a predominantly mathematical type of deductive reasoning which ignores the psychological component masking or aggravating a large number of afflictions.

Modern medicine must therefore attempt to encourage ever-increasing scientific rigor in the investigation of patients' ailments without losing sight of the irrational and human aspects of each problem which it must solve.

# DATA PROCESSING IN MEDICINE

The advent of microprocessors and the spectacular fall off in hardware costs have resulted in a substantial improvement in medical apparatus, reinforcing the scientific aspect of the medical art. Microelectronics has blazed a trail for highly-sophisticated techniques multiplying the possibilities of patient examination and monitoring available to the physician, while submerging him in ever-increasing - and not easily digested - volumes of quantitative data. The data processing tool has been seized upon as an irreplaceable means of synthesizing this data and extracting its significance.

Testimonials to this include the computer which enables rapid interpretation of the complex X-ray pictures taken by the medical scanner, computer-assisted monitoring for continuous surveillance of patients' physiological parameters, continuous automatic electrocardiogram analysis and so on.

But today's data processing also means the capability of storing huge masses of information and ad hoc retrieval procedures. Gigantic data banks are thus being developed with the intention of gathering the totality of medical knowledge concerning specific subjects. Examples include:
- the MEDLINE documentary system, offering references in the worldwide medical literature,
- medication data banks, providing on-line information on counter-indications, equivalences between differently-named pharmaceuticals, possible secondary effects due to simultaneous use of multiple medications,
- computerized medical file systems, enabling researchers to carry out epidemiological studies facilitating government decisions on health policy or medical research priorities,
- large-scale statistical studies providing the physician with an incomparable research tool and permitting construction of decision trees as an aid to diagnosis.

The contribution made by today's data processing would thus already appear to be a positive one, as it relieves the physician of a heavy and tedious burden by synthesizing measurement results and placing increasingly-complete sources of information at his disposal. A substantial intensification of this contribution is already foreseen, however, and we might even imagine that, on some not-too-distant day:
- doctors' offices will be equipped with terminals for remote interrogation of patients' medical files, the medication safety data bank and the listing of available beds in neighbouring hospitals. The physician might even use his computer for initial questioning of the patient who, having a terminal in his home, will find it only natural to describe his health problems to his doctor's terminal device. The patient may in turn ask the doctor's terminal to suggest additional examinations or indicate the respective probabilities of various possible diagnoses.
- thanks to their ambulance-monitoring and automatic mapping systems, emergency-service control centers will be able to select the means of response most suited to the nature of a call, and to direct the paramedical team to the patient's location by the quickest possible route; the patient's microcircuit-controlled medical identification badge, containing vital data (blood type, chronic illnesses, etc.) will permit immediate access to his medical record.
- artificial limbs and organs will be implanted as a matter of course; these prosthetic devices - simulating the infinite complexity of the human organism as completely as possible, thanks to microprocessors - will transform information technology into a true instrument of medical care.

The increasing computerization of medicine will thus become «transparent», both for the patient and for the doctor, thanks to a systematic use of data processing raised to a new stage of development. The assistance to examination and diagnosis brought by this new information technology will permit a revaluation of the human relationship, an essential condition for any good practice of medicine.



- *Physiological monitoring of critically-ill patients requires a continuous knowledge of significant parameters, such as the heart rate, in order to plan out lifesaving therapy. This surveillance, beyond the capabilities of a human operator, has been implemented by «conventional» monitoring resources during the past; computer-aided monitoring adds the potential for following the direction of variation of these parameters, alone or in combination.*

## MEDICAL LABORATORIES AND NON-NUMERICAL PROCESSING

Medical test laboratories make daily use of data processing to solve their management problems or to process tests and print out numerical results. The computer is soon to provide them with test results in the form of texts containing explanations and comments as well as figures. The reason for this is that such tests, often performed repeatedly for a single patient, necessitate the compilation of a record file, accessible in real time and easily readable, in order to permit evaluation of changes in the patient's condition.

In France, CAP GEMINI SOGETI decided to meet this need by designing and implementing a system simultaneously performing all necessary functions: text processing for retrieval of results, laboratory management and, finally, archival filing.

## DENTIS

The DENTIS system, developed in Holland by CAP GEMINI SOGETI, provides the dentist with a management aid and simplifies his administrative tasks. It manages patient records, keeps tabs on current dental treatment, manages his appointment book and provides him with complete client statistics. The system itself prepares documents required by insurance organizations and, finally, keeps all of the office's books.

Following entry of basic information, such as the patient's identity and his insurance program, a «menu» listing possible treatment modules is displayed for selection by the dentist or his assistant. The system can display the patient's dental history as the patient is being prepared, or - as soon as treatment has been performed - print out reports on insurance forms, set a date for the next appointment, etc.

Implementation of the DENTIS system was made possible by the merger of two central factors: development of reliable, inexpensive equipment - such as microcomputers, diskette units and keyboard display consoles - and, above all, generation of software offering a high level of assistance to the user. CAP GEMINI SOGETI's broad experience permitted integration of the largest number of potentially-encountered situations thus providing the user with a system characterized by operating simplicity in spite of extreme internal complexity.

DENTIS thus frees the dentist to concentrate on his primary functions of diagnosis, treatment and advice.

# ORGANIZATIONAL CHART
# CAP GEMINI SOGETI
# AS OF MAY 1ST, 1980

## CAP GEMINI SOGETI



From left to right:
Standing: Francis BEHR: Associate Director; Michel JALABERT: Vice President;
Jean-Jack LOUDES: Director of Export Development; Serge KAMPF: Executive Chairman.
Seated: Daniel SETBON: Financial Director; Philippe DREYFUS: Vice Chairman;
Meinard DONKER de MARILLAC: Director of Communications; Jean Baptiste RENONDIN: Vice Chairman.

**48 %**

**GROUPE BOSSARD S.A.**

Jean René FOURTOU: Chairman
Jean Pierre AUZIMOUR: Vice Chairman
Georges GOURY: Financial Director

### MEMBERS OF THE BOARD OF DIRECTORS

| | | |
|---|---|---|
| Serge Kampf *Executive Chairman* | International Aeradio Limited | Patrick Nollet |
| José Bourboulon | Michel Jalabert | Jean B. Renondin *Vice Chairman* |
| Cisi s.a. | Michèle Kampf | Daniel Setbon |
| Philippe Dreyfus *Vice Chairman* | Jean-Charles Lignel | |

## CAP SOGETI LOGICIEL



From left to right: Gilbert ÉLOIRE: Deputy General Manager
Michel BERTY: President
Jean Paul FIGER: General Manager

## CAP SOGETI SYSTEMES



From left to right: Édouard BAZEILLE: Deputy General Manager
Alain LEMAIRE: President
Jean François DUBOURG: General Manager

## D.T.E.S.*



José BOURBOULON: President

## DIVISION EUROPE



From left to right: Peter DODDS: Human Relations Director;
Jean RONCERAY: Administrative Director; Christer UGANDER: President;
Harry KOELIKER: Financial Director; Jean PRADES: Marketing Director.

## DIVISION USA

### CAP GEMINI USA



Léonard JACOBY
President

*Divison Traitement, Exploitation, saisie
(computer - based services)

### TELECOMMUNICATIONS



Rémy DESPRES
Division manager

### PARIS INDUSTRY



Jean Philippe GAILLARD
Division manager

### SORINFOR



Jacques FLEURY
Sales Manager

### PANDATA (HOLLAND)



Aad UIJTTENBROEK
General Manager

### BRA (SWEDEN)



Kaj GREEN
General Manager

# THE BRANCH
## CORNERSTONE OF
## CAP GEMINI SOGETI'S ORGANIZATION



| MAIN BRANCHES | | BRANCH MANAGERS AND CHIEFS |
|---|---|---|
| PARIS | Accounting data entry | Marc Deroubaix |
| | A.D.R. Products | Jean-Claude Huvet |
| | Banking 1 | Jean-Luc Château |
| | Banking 2 | Christian Chevallier |
| | C.G.S. Products | Jean-Louis Ziesch |
| | Chemicals ind. | Raymond Pawlowski |
| | Civilian government | Robert Dunand (acting) |
| | Contractors 1 | Denis Sergent |
| | Contractors 2 | Alexandre Lévy |
| | DATACOM products | Gérard Rombaut |
| | Electrical Manufacturing | André Woroniak |
| | General and industrial data entry | José Shoyaka |
| | Insurance | Josyane Muller |
| | Manufacturers 1 | Pierre Gillier |
| | Manufacturers 2 | François Vallet |
| | Mechanical industries | Jean-Pierre Rey |
| | Military | Christian Gallin |
| | Operations 1 | Georges Cohen (acting) |
| | Operations 2 | Jacques Mons |
| | Petroleum ind. | Jorge Monteiro de Oliveira |
| | Public-sector corporations 1 | Bruno Clery |
| | Public-sector corporations 2 | Jean-Marie Barre |
| | Services | Pierre Guillomon |
| | Telecommunications | Jean-Michel Conte |
| | Telephone terminals | Michel Combes |
| | Videotex data entry | Robert Duflos |
| RENNES | | André Renault |
| RIJSWIJK - East | | Ton Knoetschke |
| RIJSWIJK - West | | Piet Adriaanse |
| RIJSWIJK - Training and products | | Henk Oudshoorn |
| ROTTERDAM | | Hans Boom |
| ROUEN | | Philippe de Beauchamp |
| STOCKHOLM 1 | | Leif Sandberg |
| STOCKHOLM 2 | | Leif Bjordell |
| SUNDSVALL | | Lars Sundberg |
| TOULOUSE - Software | | Jean-Louis Boudineau |
| TOULOUSE - Systems | | Paul Chaffard |
| UTRECHT | | Rob Starreveld |
| WASHINGTON | | Len Jacoby (acting) |
| ZÜRICH 1 | | Arthur Holenweg |
| ZÜRICH 2 | | Erwin Esterman |

Any company's true field of application is situated where its operational units are in contact with the market. This is where the customer truly meets the company: not an economic concept, but the individual or team representing it, the work that it carries out, the project that it implements. And this is also where the company takes the pulse of the market and responds to its needs.

The importance of this point of contact has led CAP GEMINI SOGETI to make its highly-independent Branches the «lowest common denominator» of its organization. Consolidated into divisions (which in turn form companies), CAP GEMINI SOGETI's eighty Branches - whether in Switzerland or France, in Belgium or Great Britain - all have the following common features:
● a Branch covers a well-defined territory, whether an economic or geographic sector. Thus, for example, the Banking Branch of CAP SOGETI SYSTEMES'Service Sector Division is responsible for the financial sector in the Paris region, while CAP GEMINI DEUTSCHLAND's Berlin Branch handles a specific geographic zone.
● responsible for his resources and his results, each Branch Manager is tasked with implementing his organization's commercial operations, with getting its projects done, with management of his personnel and maintenance of the technical quality of jobs performed. He is answerable to his Division or country manager for the performance of these obligations.
● the Branch Manager knows every employee and every customer personally. This puts him in a position to receive the most direct possible information and to make the most balanced possible decisions with regard to - for example - employee assignment, career orientation, or solutions to be proposed for solving a problem raised by the customer. But this personal acquaintance implies that a Branch cannot grow beyond a limit of roughly fifty people. New Branches are thus created, leading to an increasingly-refined market coverage.

Under these circumstances, it is obvious that each Branch will have developed its own personality, reflecting its geographical situation, its history, its market and the character of its manager and its workforce.

A Swedish paper pulp manufacturer clearly will not be faced with the same projects nor employ the same working methods as a Paris bank. And it is characteristic of Europe that the various regions of a given country keep up their own customs and their own ways of doing things. The diversity of personalities of the Branches of CAP GEMINI SOGETI responds precisely to this diversity of national and local circumstances.

Branch Managers are provided with a technical staff and, depending on Branch size, they may be assisted by one or more Sales Engineers for market canvassing, drafting of proposals and contract negotiation. Several Branches - or even several Divisions - are generally involved in the case of very large projects. In such instances, proposals are drawn up and operations planned and managed at Company level. As autonomous legal entities, Companies retain responsibility for their financial and legal services, for organization and methods, for the development of special techniques, for general employee training courses and so on.

The «Branch» concept thus provides CAP GEMINI SOGETI's customers with sustained personal attention adapted to match their own personalities. Moreover, it enables Group Companies to grow «naturally» through the multiplication of their Branches. Finally, it provides CAP GEMINI SOGETI with a means of «real-time» acquaintance with the problems and requirements of data processing systems users, and to orient its medium-term development on the basis of this knowledge.

# CAP GEMINI SOGETI'S PLACE
# ON THE COMPUTER SERVICES MARKET

Closing the books on the final year of a decade quite naturally encourages us to do the same for the past ten years, and to attempt to disengage the major transformations to mark the ten years to come.

In the computer services field, this exercise leads us to characterize these two eras by two seemingly-contradictory words: MATURITY and CHANGE.

## MATURITY

Ten years ago, computer services companies were few, small and little-known. CAP (France's leading service firm at the time), GEMINI and SoGETI, still separate, accounted for combined total sales of 9 million dollars. In 1979 service-company business volume places them in the very leading ranks of the developed nations' economies: their market represents over 19 billion dollars. And the CAP GEMINI SOGETI Group showed consolidated 1979 sales of 113 million dollars for data processing services alone, for a twelvefold increase in ten years!

The inset (opposite) shows the size of major national computer service markets in 1978*, broken down - as is now customary - into:
●**software services:** consulting, systems design, standard and custom software implementation, technical assistance, training, etc...
●**turnkey systems:** implementation of turnkey systems, notably including both hardware and software.
●**computer-based services:** service-bureau batch processing (local or remote), timesharing, data bank operation, etc...

In particular, this table indicates that:
— the Western European market is now nearly 70% as large as the US market, in contrast to somewhat over 50% in 1974.
— while the French data processing service industry is still the European leader (27% of the total), it has lost its worldwide second rating to Japan: this country, having devoted the past 5 years to an intense effort to overcome its lag, has won back its domestic market and may be playing a significant international role in the near future.

*\* 1979 statistics were not yet available as this report went to press.*

## CHANGE

Change is evident, whether viewed from the technological, technical, economic and even sociological standpoints.

Among the numerous events attesting to this evolution, we might cite the following:
● the project management for very large projects is increasingly being placed in the hands of the leading service companies. These projects, involving contract amounts sometimes running into the tens of millions of dollars, generally imply the involvement of a number of subcontractors and a number of individual disciplines.
● the appearance of the microprocessor, with its impact on information technology, is opening up new markets at the same time as it significantly transforms the way in which traditional users are expressing their needs.
● hardware represents an increasingly small share of DP systems cost, making applications increasingly desirable and software increasingly vital, both from the standpoint of anticipated quality as well as from that of the quantity to be implemented.

Responding to the need for more rapid software development, CAP GEMINI SOGETI has implemented and will soon market SIP, the «computerized system for the programmer», a description of which is given on page 7 of this report.
● new information systems are making their appearance, in the wake of «trailblazing» services and of resounding successes such as SWIFT (worldwide interbank transaction management network) and SITA (international air traffic control network). On the international level, these new services involve:
— packet-switching data transmission networks (TRANSPAC, EURONET, PSS, etc...)
— hight-capacity satellite networks (SBS, XTEN, TELECOM 1,...)
— TELETEX, FACSIMILE and VIDEOTEX (PRESTEL, TELETEL,...)
— all dedicated services making use of the abovementioned basic techniques and designed for specific users such as news services, banks, hotel chains, stock exchanges, etc.
— office automation, the applications of which may be implemented on service centers, etc.

The common denominator of these services is the massive use of digital techniques and complex software products. Their launching and operation will require commercial, technical and financial management on a par with that exercised by the largest service firms.

Among the numerous functions which service companies can claim to carry out in the field of new information services, the following two deserve special mention:
● **network and system design and implementation:** on the 1985 horizon, the market opened by infrastructural investment in these new services should be on the order of half billion dollars in Europe;
● **operation and sales of services:** still on the 1985 horizon, this field will enjoy an annual European market in the neighborhood of 2 billion dollars.

The CAP GEMINI SOGETI companies are already very active in the area of information systems, as witnessed - for example - by their achievements in computer-based tourist reservation service (see pages 12 and 13) and videotex services (see pages 4 and 5).

The '80s should thus be a period of continuing development, in the image of the preceding ten years, for the computer services market. This development will take place in a ceaselessly-changing environment, one particularly marked by the applications of new information systems.

Catalogue et abonnement: INFORMATION-S.P.I. 77, rue Paul Clamorgan, 92200 Neuilly. Tel. 633.53.32, photos: B.Müller, Georges, Roth. S.E.F.P.A. Imprimé en France