USE OF ON-LINE DATA BASES BY DEVELOPING COUNTRIES

PROSPECTS AND PROBLEMS

THE CASE OF MEXICO

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BACKGROUND

The use of on-line bibliographic data bases is provided in Mexico through SECOBI (Servicio de Consulta a Bancos de Informacion-Consultation Service to Information Banks), a service operated by CONACYT (National Council for Science and Technology), since 1976.

CONACYT is the agency of the Mexican Government, responsible for the development of science and technology in the country. Among other responsibilities, the law that created the institution in 1971, assigns to the Council that of creating a national information and documentation service.

The main motivations for the initiation of the service, came from the need to develop a national information system for science and technology [1,2]. The activities were triggered by several visits to different countries in 1974-75, and by studying some experiences developed at international organizations [3]. Some commercial experiences were also taken into account [4,5].

Among the objectives foreseen at the creation of SECOBI, were the following:

a) Providing greater facilities to access international information
b) Developing a fast and effective service
c) To generate local experience in modern technologies
d) Establishing the basis for development of local data bases
e) To explore possibilities of avoiding excessive dependency from abroad
f) Promoting the development of the national information system for science and technology
g) Offering information support to the scientific and technological community at affordable prices

These objectives, with some adjustments in priorities, could still be considered effective at the present time.

SITUATION IN 1975

The first discussions for establishing an on-line service in Mexico, faced different problems and points of view.

On one side were the technology enthusiasts, arguing that this technology could solve the information and documentation problems of the country, usually without clear understanding of the issues. They were in general, technical specialists.

Another view was held by many librarians and documentalists, with very limited understanding of the technology, and worried about the difficulties of learning new techniques and about the possibilities of losing their jobs.

A more rational opinion was held by other people, stating that this was a good opportunity for the country to enter a new technological field, acquire experience, and provide additional services.

Some arguments were related to the priorities for developing a national information system. Many people felt that in a country such as Mexico, the maximum priority should go to the development of collections, education and training, and other traditional aspects. These points caused some concern and were duly considered; however, it became clear after the preliminary discussions and feasibility study [6], that it was possible to create SECOBI without significantly interfering with more conventional activities.

Other important problems in developing SECOBI were the legal aspects for the organization of the telecommunications facilities. A presidential decree of 1972 [7], defines public data transmission services as an exclusive monopoly of the Ministry of Transportation and Communications (SCT). This implied several aspects.

The Ministry of Communications, at that time, did not have the necessary facilities for packet switching data transmission. Further, this was a new technology for telecommunications specialists, and they were not willing to make policy decisions on these issues without a deeper knowledge of the long term implications.

A supplementary problem derived from the fact that SCT was applying to data transmission services, some of the policies and concepts from more traditional services, such as TELEX. This included regulations against the use of dial-up telephone lines.

This issue was finally settled on a temporary basis, through an agreement between SCT and CONACYT. This became possible by appointing CONACYT as an agent acting on behalf of the Ministry, and on the ground that the Ministry did not have the necessary facilities at the time. It was also taken into account, the non

commercial nature of the proposed service, and its relevance in the support of scientific and technological activities of the country.

The training aspects were also an important problem that had to be tackled. There was no one available with even a minor experience in on-line searching. The vendors were too far, in a different country, and the most knowledgeable people had only seen some demonstration. Therefore, for the first several months, learning had to be based on trial and error, through telephone consultation, and when the mail finally delivered them, by reading the manuals. Some courses by vendors were organized after the initial tests, to supplement the training of local searchers and trainers.

After getting acquainted with the systems and gaining some experience, the promotion and the training for users were considered.

However, an important effort and a long time were required to convince the most prestigious libraries to subscribe to the service. The most readily interested organizations were not usually libraries, but research centers, new and specialized information centers, government organizations, and private enterprises.

Also necessary was the acquisition of terminals and of a node for an efficient connection to TYMNET (the only convenient network at that time). This imposed a necessary delay, and forced the very first users to operate through long distance calls to the network in the United States, for several months.

Early in 1976, all the required elements were ready, and the service was formally opened.

PRESENT STATUS

At the present time, SECOBI covers the most important cities of the country, providing access to researchers, professors, students, professionals, entrepreneurs, government officials, and the general public.

SERVICES

Six main services are provided at this time:

a) Information retrieval.
Aimed at the general public, it is provided by 13 public posts in several parts of the country, operated by searchers from SECOBI's staff. The user is charged for the direct costs, with special discounts for students, professors and researchers. From January to August 1984, a total number of 1983 searches were made under this service, for an average of 248 per month.

b) Documentation support.
Mainly oriented as a supplement of the previous service. At the user's request, the staff will locate, acquire and deliver a copy of the original document. The user is charged the direct costs. Requests for this service came to 981, for a monthly average of 123 from January to August 1984.

c) Translation.
When requested by the user, the documents can be translated into Spanish. This is done through outside translators. The user covers the direct costs. Statistics for this service from January to August 1984 are: 52 requests, averaging 7 per month.

d) Direct service.
This service is designed mainly for medium to high volume institutional users. A contract is signed, and the user receives a password to access the data bases. The necessary terminal equipment and MODEM can be rented from SECOBI, or purchased directly by the user. Microcomputers are beginning to be suggested as a good alternative, if the user is going to purchase the equipment.

For this service, the user pays an initial fee that covers manuals, training and technical support. The operational costs, including telecommunications, search time, etc., are billed monthly to the user, including the rental for equipment, if provided by SECOBI. A special discount financed by CONACYT is granted to research and educational non profit institutions. More than 170 terminals are operational under this service.

e) Support.
A continuing support and technical advice service is maintained. This covers maintenance of SECOBI's terminals and MODEMS, advice on the selection of equipment, connection problems, strategy formulation, command usage, procedures, data base characteristics, and other problems that a user may find using the service. These are usually provided without charge, when requested in reasonable volume.

f) Training.
A strong program of courses is regularly operated covering from basic aspects to specialized topics. Most of the courses are billed at nominal costs, while other are provided at no charge. From January to August 1984, 53 courses were held (7 per month), with an attendance of 429 participants.

A special arrengement is available to support the service offered by the Ministry of Health. In this case, SECOBI's infrastructure is used to provide access to the MEDLINE system, which is operated in Mexico by this Ministry for the biomedical users.

The total usage of SECOBI is well over 600 hours of connect time per month. This average for 1984 is above the figures of 1983, but below those of 1982. The reduction was due to the economic problems of the country at the end of 1982, but the demand is taking its regular growth pattern again.

INFRASTRUCTURE

The technical infrastructure is presently based on an old node connected to TYMNET. This is being substituted by a new node of the public packet switching network, which has been developed by the Ministry of Communications (TELEPAC), and has recently became operational. This will reduce costs and improve quality and effectiveness of service, specially to users far from Mexico City.

The legal aspects for using telecommunication facilities, have been solved with a new agreement signed between the Ministry and CONACYT last August. The agreement incorporates several important provisions, including: easier procedures to access TELEPAC for SECOBI users, through a special contract; connection to the network of the mainframes needed by CONACYT for local data bases; and provisions for a joint effort in the promotion and coordination of data base development and use within the country.

CONACYT has a Burroughs 5900 with 2000 MB of disk storage, acquired for administrative purposes. This machine has been connected to the network and is available to SECOBI users under controlled conditions. At this time it is used to access a data base on economic data, developed by the Bank of Mexico (SIE-BANXICO), containing more than 15,000 time series, updated weekly.

The human infrastructure of SECOBI is composed of 41 persons: 28 at the headquarters and 13 in the public service posts. Figure 1 shows the organizational structure of the Direction of Informatic Services, with details of SECOBI's organization.

Most of the technical people have received in-depth training and participate permanently in seminars, courses, demonstrations and other activities, both as instructors or as participants. However, the training of technical personnel is a never ending task, which requires more time and resources than presently available for this purpose.

The data bases are accessed through contracts with 9 organizations from 4 countries (U.S., France, U.K., and Mexico). Therefore the user can choose from more than 400 data bases in almost every field of knowledge.

Also available are some facilities such as classrooms, teaching materials, reference documents such as thesauri and catalogues, as well as other supporting elements.

PERSPECTIVES

The future projection of the services is being developed under the guidelines established by the National Program for Technological and Scientific Development 84-88 [8], a document recently approved by the Government of Mexico. This document includes a program for scientific and technological information, which encompass the services provided by SECOBI.

In addition to the mandate for providing, expanding and improving the service, a high priority has been established for the development of National Information Banks. This is particularly important since it should allow the country to organize its own information, and to gain easy access and better control of the information needed, or of strategical importance [9]. Therefore, this can be seen as an essential step towards a greater self-determination.

Additional benefits that can be gained through the availability of local data bases, are related to the ease of access, lower costs, savings in foreign currency, and better adaptation of the services to the local users. It is also worth mentioning, a better position for international negotiations, and the possibilities for regional developments.

As one of the initial steps for the implementation of this strategy, a committee for the development of National Information Banks has been appointed. More than 25 institutional representatives participate in the plenary sessions, and well known specialists cooperate in the technical work.

The committee has approved the following recommendations of technical task groups:

1.- To adopt ISO 2709 as the basis for magnetic tape format
2.- To adapt CCF [10] as the communications format for Mexico

Groups of experts have been appointed in the following subcommittees at the November meeting of the committee:

1.- Priorities and planning
2.- Promotion
3.- Training
4.- Indexing and abstracting
5.- Cataloging
6.- Software
7.- Referral activities
8.- Terminology

Some of the immediate activities derived from the committee, are the following:

1.- Several courses for data base producers are being planned for 1985, in order to develop the necessary human infrastructure.
2.- The translation of CCF into Spanish is under way.
3.- Several software guidelines are being developed.
4.- A survey of data bases is being designed, to cover existing, under development, and planned activities.

In addition, several negotiations are under way, to develop data bases, or to make them publicly available. Some examples include: Mexican patents, Trade marks, Internationally published Latin American articles, On-going research in Mexican Universities, Mexican journals, Directory of researchers, and several other.

Since the available computer capacity is limited, and the service must compete for resources with other applications, the aquisition of a dedicated machine is seen as an unavoidable need in the very immediate future.

NEW SERVICES

One of the most difficult aspects of dequate on-line information services in a developing country, is the access to the original document [11]. Therefore, one of the most needed features is the capability of locating journals within the country.

This problem is being addressed through the Union List of Serials. This is being compiled at present, and will be linked to the on-line service, so that after a search locates the relevant documents, the user can find the original document if it is available in a Mexican library.

Another important need [12], that could be seen as a second step, is the capability of ordering a copy of a document, or making an interlibrary loan request. This is being addressed through a specialized electronic mail system that can keep track of services provided, costs, and pending requests. The authorized users could link to this capability as a continuation of an information retrieval session. The service is scheduled to operate as soon as the necessary computer capacity is guaranteed.

In addition to the facilities for locating journals in participating libraries, it is also important to be able to locate monographic materials. However, such a service would require a Union List of Monographies, which would be extremely expensive to produce. Therefore, this is being planned as part of another system, aimed at facilitating the cataloging and processing.

This system will initiate with a fairly large collection of bibliographic information from one of the big library systems already in machine readable format. The participating libraries will add to this collection and use it for their own cataloging.

Therefore, the Union List of Monographs will grow gradually, providing in the process both cataloging support, and information on availability of materials. The organizational details are under study to assure the widest participation, and the best possible service.

Another service which will be developed for a pilot demonstration in early 1985, contemplates the use of satellite links for dissemination of information. This project is being developed in cooperation with the Intergovernmental Bureau for Informatics [13], using one-way broadcasting of information, and could provide new ways of supplying information, taking advantage of the capacity of the satellites purchased by the Mexican Government. The possibilities for information exchange among latin american countries look also very promising.

CONCLUSIONS

The development of on-line information services in Mexico has been both feasible and useful. It has provided the necessary background for the development of better services, and is being instrumental in the creation of local services and data bases.

The implied monetary costs are within the capabilities of most countries, both for the necessary investment in equipment (less than $50,000 USCY would be needed for a small node and several terminals), and for the operational expenditures (proportional to the size of the country).

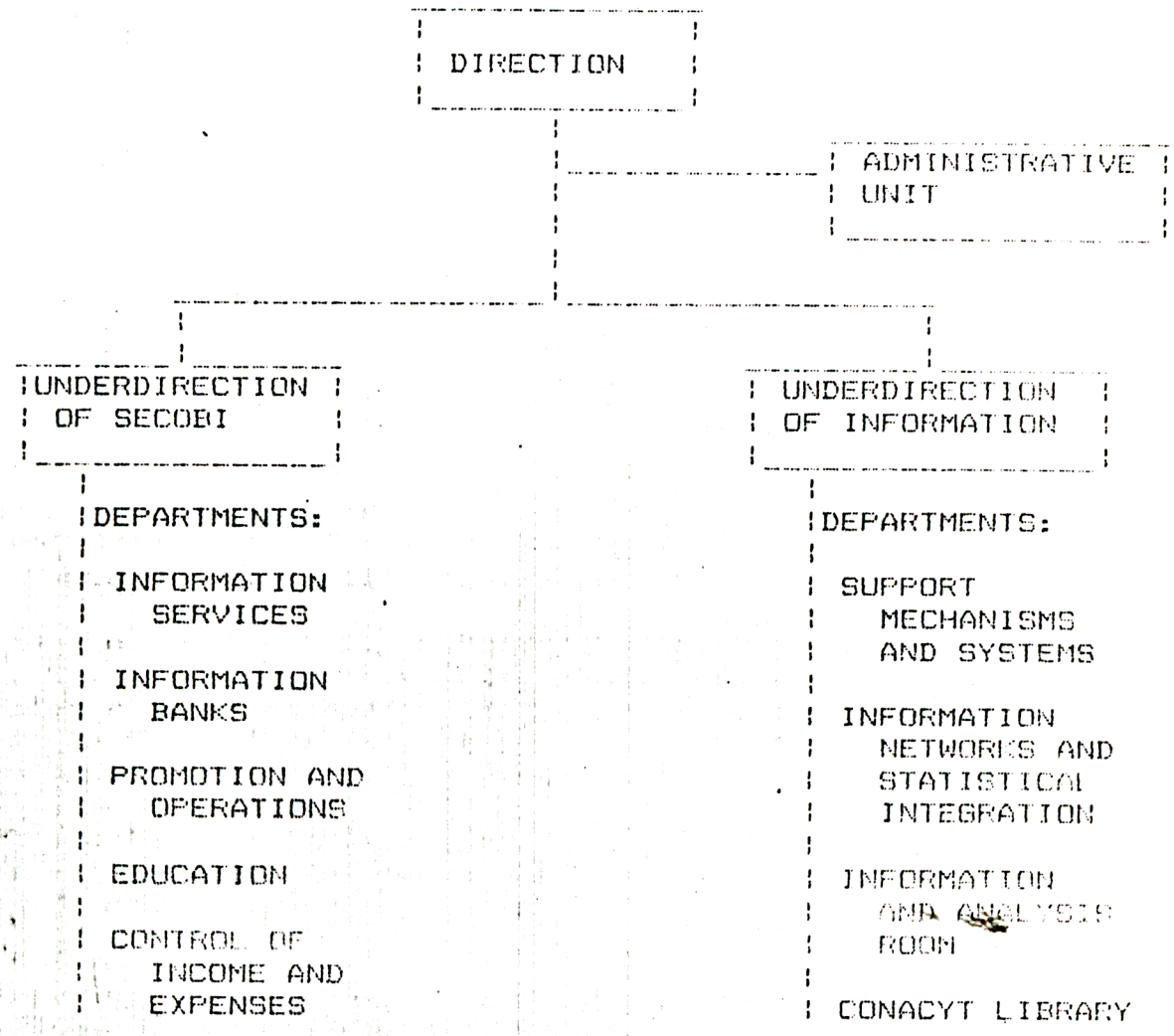
Telecommunication facilities or regulations [14], should be considered as a key element. For some countries, the existing links could be of insufficient quality or capacity. In other cases, the topology of current channels could be inadequate. Under these circumstances, it could become extremely difficult to set up a service.

It is also important to stress the need of trained specialists, and sufficient promotion. Also, some mechanisms for partial subsidy under a clear policy is highly desirable.

Considering the increasing importance of information as a tool for development, and the trends of the information industry in more developed countries, it could be said that the costs and problems encountered in the implementation and operation of on-line services, are a challenge that has to be met by developing countries, if they want to prevent a faster widening of the gap with industrialized nations.

FIGURE 1

ORGANIZATION OF THE DIRECTION
OF INFORMATIC SERVICES



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