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SUMMARY APPRAISAL OF TECHNICAL INFORMATION SITUATION IN LATIN AMERICA IN RELATION TO POSSIBLE INTERNATIONAL NETWORKS

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FOREWORD

The terms of reference for this four week study were:

1. To explore the feasibility of creating a Latin American technical information network;
2. To assess the current technical information supply and demand situation in Latin America, and
3. To formulate guidelines for the development of information linkages and international networks.

The methodology employed in this study was a series of 14 personal interviews and several telephone interviews with knowledgeable technical information people in Mexico and Canada, between June 14 and June 28, 1977. They are identified in Annex A.

In addition, a small number of United Nations, Organization of American States, and other documents dealing with the Latin American technical information situation were examined. They are listed in Annex B.

The cooperation of those interviewed, and the support of the CEPAL,Mexico Office staff is very much appreciated, given the short time period and the need for fast, accurate typing. However, the opinions, recommendations and shortcomings of this report are the author's alone.

This report is presented in three parts and four annexes, following an introduction.

Part I is Summary, Conclusions, and Recommendations, in two sections.

Part II is a discussion of the supply and demand for technical information in Latin America, in three sections:

A. Characteristics and problems of demand for technical information in Latin America;

B. Characteristics and problems of supply of technical information in Latin America, and

C. Summary of two major 1976 conferences on the supply and demand of technical information in Latin America.

/Part III

Part III is a discussion of definitions and relationships between information systems and networks, in four sections:

A. Schematic, description and discussion of information creation, publication, distribution and use - supply and demand;

B. Types of Technical Information Networks;

C. Some comments and questions on "International Networks", and

D. An outline for the Design of International Technical Information Networks (ITIN).

Annex A: Persons Interviewed June 14-28, 1977, Mexico, D.F.

Annex B: Bibliography

Annex C: Sample "Noticias Técnicas" (Technical News Announcements) of INFOTEC-CONACYT, Mexico, D. F.

- Industria alimentaria
- Contaminación
- Industria eléctrica
- Industria farmacéutica
- Ingeniería industrial
- Industria metalmecánica
- Industria química

Annex D: Technical Information and Assistance to Industry Program of the Organization of American States, Regional Program of Scientific and Technical Development, Special Projects of the Mar del Plata Program, March, 1977 (in Spanish).

INTRODUCTION

What information problem is trying to be solved, and who has this problem?

The basic problem is to make readily available the information required for the appropriate solution of production and related technical problems.

The user and requestor of this information is a technical planner, public or private, or a manufacturing manager, supervisor, engineer, research and development investigator, cost analyst, quality control technician, product or process designer, teacher or student of engineering, technical marketer, investor, etc.

Technical problems exist, primarily at the micro, or plant and laboratory level, may or not be widespread or common nationally or internationally, and can only be solved at the plant level, with or without external technical assistance.

Technical information systems, services and networks must be designed to start and to end at the plant or laboratory level - that is where the problems are and where the solutions must be applied (technical solutions may be developed externally, but they must be applied locally).

The phrase "international technical information network" in its formal denotation and connotations may be more misleading and confusing than helpful. It may indeed be artificial, spurious, or even metaphysical. What is needed in the international technical information arena is the cooperative exchange of information - as directly, cheaply and quickly as possible. Whether "formal networks" are necessary or desirable is not clear.

Individual and institutional users of technical information need to know where to go for information. They do not necessarily need a formal international network" for this.

/What they

What they do need is training and easy access to complete, continuously updated directories and guides to information sources, plus the services of an information delivery system which includes industrial extension agents to assist in the selection, adaptation and application of appropriate information. These directories, guides, delivery systems and extension agents are national responsibilities. The existence of any sort of useful or responsive "international network" should not be used as a substitute for, or as an excuse not to develop, effective national technical information systems. National resources should be devoted to national information system development first.

I. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. Summary of Findings and Conclusions

1. Existing sources of information and information centers throughout the world and in Latin America are now exchanging information and responding to questions from individuals, institutions and other organizations. Much of this is more or less voluntary and is done on the basis of friendship, good will, professionalism and public service. The use of commercial information services, publications, indexes, and data banks is also growing.

2. While these systems can no doubt be improved in many respects and in many specific subject fields, the way to do it is not to impose some sort of super-structure on top. There is no way to make such a superstructure work - it could not be legislated, it could not be enforced and there would never be enough resources, human and financial, available to apply to such a task. Rather, what is necessary - and is possible, feasible and practical - is to improve the quality, sensitivity and capability of existing national information systems on both the supply and demand sides. As the performance of national information systems improves, so will their international exchange and collaboration. One starts from the bottom up, not from the top down, and then proceeds incrementally.

3. In the long run, the cheapest - and the most effective - way to build an information system is to start with a small group of users, satisfy their common needs (not the needs of the system builders, operators and overseers), and then carefully enlarge the group(s) of users by offering and supplying them with the information and related services that they want and can use.

4. If one goes too fast in expanding information services, beyond the (current) capacity of the users to absorb them, it is not only a waste of money and resources, but it can easily confuse users, and potential users, and alienate them from the system. Information systems must crawl before they walk and stand before they run.

/5. National

5. National information center systems and network can profit tremendously from the international exchange of ideas and techniques and the sharing of experiences, problems, failures and successes in the handling and solving of information problems. The professional journals are one vehicle for this, but there is no substitute for face to face contact with fellow practitioners of all kinds at all levels. Continuous support of international meetings, and training at all user and supplier levels, is the easiest, quickest and cheapest way to promote the kind of informal international information exchange "networks" and "invisible colleges" that are successful in practice and are created on the basis of personal contact, friendship, mutual help, support, and professional development. Such natural growth of interest and communication serves as one indicator and basis for the development of formal international networks.

6. So far as international networks go - how long does it take to get a letter or telex answered from one country to another in Latin America? Latin American networks will be no better than the will and interest of a specific group of information users, information suppliers, and information centers to voluntarily cooperate to share information needs and resources. Their interaction to develop a successful international network - in any field (petro-chemicals, iron, rice, foundry operation, cost reduction in canning, etc.) must follow the same gradual growth patterns mentioned in 3 and 4 above, or it will fail.

7. National information referral centers, technical or otherwise, are lacking in Latin American countries. If useful information exists within a country, a person should be able to find it, but first he must be aware of it. One cannot use what one is not aware of, cannot find or cannot contact. Only if it does not exist, or cannot be found locally, should one then proceed to go outside to look for it.

8. The kind of "information on information" that would be used by a National Information Referral Center is largely absent, obsolete, incomplete and/or poorly organized in most Latin American countries.

/This explains

This explains in part the lack of many such centers - they cannot operate without proper information materials. (The lack of Latin American technical information is indicated by the fact that of some 3, 500 technical journals abstracted by Engineering Index Monthly (New York) only four are printed in Spanish.) The development and maintenance of current, correct and complete information guides and directories is an expensive, time consuming and complex task. Trade, professional and service associations in the private sector do excellent work in providing documentation in certain areas in some countries, but the government sector has responsibilities to document its own activities and sources of information, as well as to coordinate and support national information systems and a National Referral Center. (See Part III, A., for description of these centers.)

9. National switching/referral centers and national specialized information centers, where they exist, are the logical components of formal international technical information exchange networks. A general international information network could be composed of National Information Referral Centers. Specialized subject international information networks (agriculture, industry, food technology, chemicals, etc.) would be composed of national specialized information centers.

10. The INFOTEC-CONACYT, Mexico, D.F., technical information network while operating informally and at a low volume, is perhaps the most highly developed information network in Latin America. It deserves close study by those interested in developing and improving technical information centers and programs.

11. Hasty investigation has revealed three other networks in Latin America either in partial operation or in various phases of start-up. One is BIREME (Biblioteca Regional da Medicina) in Sao Paulo, Brazil, under Pan American Health Organization and United States National Library of Medicine auspices. Another is AGRIS/AGRINTER (Inter-American System of Information in the Agricultural Sciences) in Turrialba, Costa Rica, under FAO and OAS auspices, and now being reorganized.

/The third

The third is an inter-american network for transmitting bibliographic information - between libraries and documentation centers - under OAS auspices. Information on these three networks was gathered from second and third party sources and is no doubt out-of-date. Their exact status and prospects could best be determined by on-site visits and interviews.

The Caribbean Development and Cooperation Committee, organized in 1975 by CEPAL, has also expressed interest in establishing a subregional information system. However, this effort is still in its early planning stages.

12. SELA (Sistema Económico Latinoamericano) is considering developing a network tentatively called RITLA (Red de Información Técnica de Latinoamérica) but it is only in the early discussion stages.

13. Professor Armando Sandoval, Director of the Centro de Información Científica at Universidad Nacional Autónoma de México (UNAM), has been compiling, publishing and disseminating scientific announcements in Mexico, and perhaps elsewhere in Latin America. After one brief telephone conversation, further contact was impossible due to a strike at the University.

14. The International Development Research Center (IDRC), Ottawa, Canada, has been assisting the development of TECHNONET-ASIA for the past five years. TECHNONET started with six countries and now includes eleven. A description of this international technical information network was requested from Canada, but was not received before this paper was completed.

15. The nucleus of a formal Latin American technical information exchange network is now operating. For the past several years, INFOTEC-CONACYT (Mexican Information Service for Industry), Mexico City, has been publishing a monthly series of "Technical News" (Noticias Técnicas). (See annex C). These list the titles of articles of interest selected from some 450 technical and trade journals that

INFOTEC suscribes to. Technical News is sent to some 3 000 Mexican subscribers. In addition, six Latin American countries subscribe to Noticias Técnicas plus other services for a fee of INFOTEC. These six countries are Bolivia, Colombia, Ecuador, Guatemala, Honduras and Nicaragua. Five other countries receive Noticias Técnicas for casual information purposes only. These countries are Costa Rica, Cuba, Perú, Trinidad and Tobago, and Venezuela. INFOTEC has operated an "informal question and answer service" with these countries and has supplied literature searches to some of them.

All of these activities have been conducted on an informal and ad hoc basis. These information exchange activities could no doubt be expanded if more resources were available in and to each country. They take time, money and people. There is no need for a "formal network" here. There is a need for more resources to be invested in the eleven national information systems involved with emphasis on training and with some resources earmarked for international information exchange activities.

The list of subscribers to INFOTEC-CONACYT Technical Notices follows. The institutions which receive additional services, for a fee, are indicated with an asterisk (*).

The table which follows next lists twenty four National Technical Information Centers that could participate in a Latin American Technical Information Network.

This list is not intended to be complete, but includes centers most likely to cooperate effectively.

/Table 1

Table 1

NATIONAL TECHNICAL INFORMATION CENTERS THAT COULD PARTICIPATE IN A LATIN AMERICAN TECHNICAL INFORMATION NETWORK

Country	Organization	Technical Library	Publish Technical Bulletin	Publish other technical information	Industrial extension service
Argentina	INTI (Centro de Investigación Documentaria, Instituto Nacional de Tecnología Industrial)	x	x	x	x
Bolivia	DGNT (Dirección General de Normas y Tecnología)	x	x	x	x
Brazil	INT (National Institute of Technology)	Formerly supplied these services, and is being reorganized			
	IBICT (Brazilian Institute of Scientific Information - formerly IBBD)	Being reorganized to supply these services, with emphasis on bibliographic information			
	Note: Depending on final organizational structure, one of these institutions could function as the formal link with national and international information systems and networks.				
Colombia	COLCIENCIAS (Fondo Colombiano de Investigaciones Científicas y Proyectos Especiales "Francisco José de Caldas")	x	x		
Colombia	IIT (Instituto de Investigaciones Tecnológicas)	x	x	x	x
Costa Rica	CONICIT (Consejo Nacional de Investigaciones Científicas y Tecnológicas)	x	-	-	-
Chile	CONACYT (Consejo Nacional de Investigaciones Científicas y Tecnológicas)	x	x	x	-
Chile	INTEC/CORFO (Instituto de Investigaciones Tecnológicas)	x	x	x	x
Ecuador	EPN (Escuela Politécnica Nacional)	x	x	-	-
Ecuador	CENDES (Centro de Desarrollo Industrial del Ecuador)	x	x	x	x
Honduras	BCH/DII (Banco Central de Honduras, Departamento de Investigaciones Industriales)	x	-	-	-
Guatemala	INTECAP (Instituto Técnico de Capacitación y Productividad)	x	-	-	-
Guatemala	ICAITI (Instituto Centroamericano de Investigación y Tecnología Industrial)	x	x	x	x
México	INFOTEC/CONACYT (Información para la Industria)	x	x	x	x

Country	Organization	Technical Library	Publish Technical Bulletin	Publish other technical information	Industrial extension service
Nicaragua	CENIT (Banco Central de Nicaragua)	x	-	-	-
Perú	CONI (Consejo Nacional de Investigación)	x	x	-	-
Perú	INDUPERU (Industria del Perú)	x	x	-	-
Perú	ELECTROPERU (Electricidad del Perú)	x	x	-	-
Perú	PETROPERU (Petróleos del Perú)	x	x	-	-
Perú	PESCAPERU (	x	-	-	-
Perú	MINEROPERU	x	-	-	-
Dominican Rep.	INDOTEC (Instituto Dominicano de Tecnología Industrial)	x	-	-	-
Venezuela	CONICIT (Centro Nacional de Información Científica y Tecnológica)	x	x	x	x

Sources: CAS, Proyectos Especiales Cuenta Mar del Plata y Programa Regional de Desarrollo Científico y Tecnológico, marzo de 1977, and personal knowledge of author.

x = supplies service indicated
- = indicates incomplete information

/SUSCRIBERS

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B. Recommendations

1. Resources for technical information system development should be concentrated at the national level. The development of national capabilities to create, publish, index/abstract, distribute, and systematically collect, store, and retrieve technical information, should have high priority in national development plans and programs. Training requirements are implicit in these capabilities, especially training in the acquisition, analysis, adaptation and application of information at the user level.

2. Technical information systems should be developed on a sectoral basis for specific sets of users for reasons of effectiveness, efficiency and economy and concentrate on those most in need - the small and medium-sized manufacturers.

3. Each Latin American country should develop a National Information Referral Center. While this Referral Center may have branches in several locations in a country, there should be one entity in each country where a person can go for advice as to where and how he can obtain the specific information he seeks. The Referral Center contains only "information on information". It does not provide substantive information or bibliographic services but directs the requestor to those individuals or institutions that can, or should be able to provide the desired information or service. It would include guides to information available on both the public and private sector and on all professional trade, technical academic and service organizations and associations in the country. (Referral Center operations are discussed in Part III A below.) The existence and development of a National Referral Center does not preclude, but complements, the development of specialized referral centers elsewhere in the country which would be concerned with specific fields -- industry, health, agriculture, etc.

/4. The

4. The existing, informal technical information exchange network now being operated by INFOTEC-CONACYT of Mexico should be reinforced, improved and expanded by supplying increased resources to each of the countries involved. All of the countries in this informal network, with the exception of Cuba and Trinidad and Tobago, are participants in the OAS Proyectos Especiales Cuenta Mar del Plata, and are therefore in a strong position to accelerate this network's development if they so desire. (See Table 2 for specific countries and institutions participating and recent (1974-1977) technical information budgets. The Caribbean Developments and Cooperation Committee of CEPAL may also wish to provide additional support to the INFOTEC-CONACYT efforts in its subregion. Annex D presents summaries (in Spanish) of the recent activities of the twenty-one institutions participating in the Mar del Plata Technical Information and Assistance to Industry Program of the OAS.)

5. The historical evolution of the informal INFOTEC-CONACYT technical information exchange network should be studied and reported on as a case study, and, if recommendation number 4 above is put into effect, the further development of this network should also be studied and reported on to supply guidelines for the development of similar networks in Latin America and elsewhere.

/Table 2

Table 2

PROYECTOS ESPECIALES CUENTA MAR DEL PLATA

REGIONAL PLAN ON SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT, 1974/1975 TO 1976/1977

Programme on information and technical assistance for the industry

General objectives

Application of the existing technological knowledge to production. In order to obtain the best results, the technical information diffusion process is organized so as to guarantee its reaching the industrial system. It is also necessary to organize the stocking of information, its recovery and diffusion. To this effect, interchange agreements are being established, specialized lists published and automatic systems are being utilized.

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Participating institutions		Amount		
		1974/1975	1975/1976	1976/1977 a/
Bolivia	Dirección General de Normas y Tecnología, DGNT	55 000	11 200	31 700
Colombia	Fondo Colombiano de Investigaciones Científicas y Proyectos Especiales "Francisco José de Caldas", COLCIENCIAS	28 000	59 400	97 500
	Instituto de Investigaciones Tecnológicas, IIT	52 900	63 300	-
Costa Rica	Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT	-	30 000	10 000
Chile	Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT	52 000	30 000	10 000
	Instituto de Investigaciones Tecnológicas INTEC/CORFO	48 000	30 000	10 000
Ecuador	Junta Nacional de Planificación y Coordinación, JUNAPLAN	-	20 100	4 000
	Escuela Politécnica Nacional, EPN	10 000	18 000	14 000
	Centro de Desarrollo Industrial del Ecuador, CENDES	10 000	31 000	15 260

/(continues)

Table 2 (Conclusion)

Participating institutions		Amount 1974/1975	1975/1976	1976/1977[a/]
Honduras	Banco Central de Honduras, Departamento de Investigaciones Industriales	-	29 900	37 900
Guatemala	Instituto Técnico de Capacitación y Productividad, INTECAP	-	15 000	65 000
México	Información para la Industria, INFOTEC/CONACYT	100 000	120 000	63 000
Nicaragua	Banco Central de Nicaragua	-	18 200	42 000
Perú	Consejo Nacional de Investigación, CONI	32 000	21 000	-
	Industria del Perú, INDUPERU	24 500	16 000	-
	Electricidad del Perú, ELECTROPERU	20 000	16 000	-
	Petróleos del Perú, PETROPERU	20 000	16 000	-
	PESCA PERU	-	6 000	-
	MINEROPERU	-	6 000	-
República Dominicana	Instituto Dominicano de Tecnología Industrial, INDOTEC	-	41 000	35 200
Venezuela	Centro Nacional de Información Científica y Tecnológica, CONICIT	360 000	262 900	70 000

a/ Preliminary.

II. DISCUSSION OF THE SUPPLY AND DEMAND FOR TECHNICAL INFORMATION IN LATIN AMERICA

A. Characteristics and problems of demand for technical Information in Latin America

The need for technical information exists in every manufacturing plant, laboratory and planning agency in Latin America.

A major problem is to translate these needs, however poorly or incompletely identified, defined or articulated they may be, into effective demand that can and will be responded to by appropriate public and private agencies and information services.

Information users must make their needs known loudly, clearly and continuously, individually and collectively through trade, technical and professional associations, to government agencies and other potential sources of information support. "The squeaky wheel gets the grease."

To assist this existing, but latent, demand make itself known, both public and private suppliers of information and technical assistance must also loudly, clearly and continuously broadcast (publicize) their existence, capability, availability and desire to serve the technical community.

Training and promotional activities are required on both sides. These requirements can be met through professional, trade and technical association training programs and publications preferably conducted with the support and participation of government agencies and information centers. The information needs of small and medium sized industry require special attention (state and large private enterprises generally take care of themselves).

Problems of supply and demand of technical information are largely marketing type problems that can be solved by marketing techniques such as market research (of user needs); product design (of information collections); distribution (delivery systems for information); and promotion (better utilization of information systems to solve technical problems and increase productivity).

/The major

The major concern is relevant, useful and appropriate technical information. How can it be established whether a given piece of information is relevant, useful and appropriate? One must determine whether it fits the technical requirements of a given problem in a specific context: an engineering design problem, a malfunctioning or excessively costly process, a broken down piece of equipment, or a poor quality product and disatisfied customers. The perceived nature of the technical problem determines the kind of information needed to solve it. One may know what information is needed and what questions are to be asked, but one cannot establish the relevance, usefulness and appropriateness of any piece of information until it is first acquired from some source, and secondly, reviewed, analyzed, compared and screened against the requirements of the specific problem-situation one is concerned with. This can only be a matter of trial and error, the use of the "experimental method". Of course, the better the questions are (specific, concrete, concise, etc.) the better the chances are of acquiring meaningful information the first time around.

Poor questions produce voluminous "answers", if any, that are costly to screen, time consuming and often confusing and misleading. They can overload and break-down information systems.

The effective, efficient and economical use of information systems requires experienced, trained, knowledgeable, pragmatic people.

Unlike science, the creation of technical information is only a by-product of a problem solving effort. Most technical problem solving activities in industry, and in many industrially oriented research institutions, do not create or require formal, written technical documentation. There the task is to produce solutions to problems, not to produce papers.

"Appropriate technical information" rarely exists per se and a priori. Information, most of the time, must be reformed, reshaped or restructured in order to become "appropriate" for specific application to a specific technical problem situation.

While access to technological data and information banks is important, that information must be analyzed, fittered, modified and repackaged before it is in a form suitable for use. This is a major function of Technical Information Centers. Such centers exist in most Latin American countries, but are well developed in only a few.

/B. Characteristics

B. Characteristics and problems of supply of technical information in Latin America

One must confine the discussion to published technical information; unpublished information exists, but is accessable only on a personal "invisible college" basis outside of formal information systems and networks. Its acquisition is subject to the initiative, ingeniousness and determination of the potential user and the grace and willingness of the author or possessor of the information to release it in any form. It is beyond formal control measures.

"Restricted information" may be for sale under certain conditions, as part of a license, equipment purchase, "know-how" agreement, management contract, or subscription to a hard copy, microfiche or computerized data base service. This type of information falls under the category of "intellectual property", is also beyond the scope of this paper and is the special concern of the World Intellectual Property Organization (WIPO).

There is comparatively little technical information created and published in Latin America, in both absolute and relative terms, in proportion to the amount of industrial activity. While comparative statistics could be assembled to support this statement, one fact should be sufficient for the moment: of some 3 500 technical journals published in the world that are abstracted by the Engineering Index Monthly (New York), only four are printed in Spanish. One of these is from Mexico on cement, the other three are from Spain, one on cement and the other two on metallurgy.

This means that most of the printed technical information in the world is not published in Latin America and is not printed in the Spanish language which raises basic problems of importing and distributing technical information and translating it into Spanish (and Portuguese). The more fundamental problem of increasing the quantity and quality of Latin American technical publications is not discussed further here. (In this connection, it should be pointed out that very few Latin American technical publications have annual indexes which would greatly simplify the task of searching the indigenous literature).

The lack of indexing and abstracting of indigenous Latin American technical information has thus forced reliance on extra-regional sources in the developed countries, such as the U.S. Engineering Index (derived from 3 500 journals from all over the world, 6 000 abstracts per month)

/and the

and the British INSPEC abstract services in the electronic, electrical, computer, mechanical engineering and engineering management fields, which publishes over 6 500 abstracts per month from the world's technical literature.

Technical information centers in many Latin American countries publish a variety of technical notice bulletins (see annex A for an example). These list titles and authors of articles judged to be of interest to their clientele, but this is done on a relatively small scale and rarely on a comprehensive and systematic basis. Some technical information centers do supply Selective Dissemination of Information (SDI) service to clients. However, this is not common as it is usually derived from a computerized data base. UNAM has been working in this field.

While the industrialized countries have developed technical information supply and distribution systems in both the public and private sectors, developing countries are having to rely on their governments to acquire technical information and make it available to potential users, public and private. In the private sector, larger companies often rely on their own resources and contacts to obtain technical information, but for small and medium size manufacturers, government agencies and government supported information centers are their primary, if not only, source. These sources are not widespread in Latin America, are in various stages of development, usually early stages, and are only capable of serving a small portion of manufacturers and researchers who could use their services.

A final point on the supply of technical information: very rarely is a given piece of printed technical information phrased or stated in a manner which permits its application to solve a problem without extensive analysis and adaptation. This is not the fault of the information which was created to solve someone else's problem. Further, the selection, analysis and adoption of information is an expensive and time consuming process which requires experienced, trained personnel - not only in the information selection/acquisition stage but also in the analytical, adaptation and application stages. Such people do not exist in large numbers and are just as much in demand in the industrialized countries as in the developing countries. These educational and training problems are quite severe, quite well known but not enough is being done about it.

C. Summary of two major 1976 conferences or the supply and demand for technical information in Latin America

The supply and demand situation of technical information in Latin America has been the subject of two recent conferences jointly sponsored by the Division of Science Information, US National Science Foundation; the FID (International Federation for Documentation) Latin American Committee for Information for Industry (FID/CIA/II); and the Bureau of Educational and Cultural Affairs, US Department of State. Denver Research Institute provided secretariat support in both conferences.

The first conference was held in Washington, D.C., 16-18 February 1976, and was on "The Role of Scientific and Technical Information Services in the Transfer of Technology in Latin America". Over one hundred people from the hemisphere attended this conference and represented both public and private interests in the supply, demand and use of scientific and technical information. The major result of the conference was a tentative "Agenda for Action". (See following pages.) This agenda was to be analyzed and discussed in depth by the participants in their home countries and then reviewed jointly with other countries at a follow-up meeting under the same sponsorship.

This later meeting was called the "Seminar on Industrial Information" and was held 1-2 October 1976 at Mexico City following the 38th World Congress of the FID. Its objectives were threefold:

"1. To achieve consensus on an updated Agenda for Action involving the various parties of interest;

2. To explore in detail the steps necessary to begin implementation of individual agenda items, and

3. To identify specific actions that can be undertaken in North America and Latin America to be responsive to items on the emergent agenda."

/Table 3

Table 3

A TENTATIVE AGENDA FOR ACTION

Action possibilities

Pilot projects

1. Initiate a pilot project to collect and desseminate "experiential" knowledge for small- to medium-scale industrial firms in a Latin American country. The Organization of American States should assist in monitoring, evaluating and publicizing the results of this project.

2. Initiate a pilot project between the governments of a Latin American country and the United States to exchange information of use to government and industry in mission-oriented areas such as the protection of the environment, energy, food, or population. Such a project could serve as a model for other bilateral Latin American mission-oriented information exchanges.

Institution-building activities

3. Initiate a promotional campaign for the establishment and strengthening of government-funded organizations in Latin American countries for technology transfer to small- to medium-scale industrial firms.

4. Extend the audience for U.S. technology and information directory services to include Latin America.

Training activities

5. Develop Latin American-based capability centers to provide training in the establishment and operation of technology transfer services, emphasizing information.

6. Develop and test a more selective curriculum for the education of information trainers in the use of STI services: a) design specific curriculum to cover new information tools, availability, places, search strategies, people involved, prices, subject areas, etc., and b) explore different format possibilities such as packages for training and instruction at remote locations.

/Research

Research possibilities

National or industry level studies

7. Develop national and industry level case studies in Latin America of successful technology transfer mechanisms for teaching and promotional purposes.

8. Conduct market segmentation studies in Latin America to identify potential information clients and their specific needs.

9. Explore the development of indigenous engineering and management consulting activities in Latin America, especially in the private sector.

10. Explore ways of serving the information requirements of an industrial receiver past the start-up phase of a technology transfer transaction.

11. Do more market research into the potential demand in Latin America for U.S. information services and products.

Broad policy studies

12. Conduct an inventory of technology transfer mechanisms, particularly those designed for small- to medium-scale industry.

13. Develop 1) basic criteria for evaluating and assessing technology transfer mechanisms and 2) channels for communicating the results of evaluations and assessments to decision-makers, clients, and other interested parties.

14. Analyze and evaluate information joint ventures between the U.S. and Latin America to determine types of ventures, types of organizations involved, costs, impacts, feedback, and implications of potential venture combinations.

15. Evaluate alternative communication technologies between and among Latin American and U.S. organizations on such factors as costs, impacts, and control.

16. Compare the agenda items from this conference with the outputs of other conferences or meetings concerned with technology transfer and/or information transfer to developing countries.

/The general

The general subject "The Use of Industrial Information in Latin America" was discussed in groups which covered the following eight topics:

1) Education/Training for Industrial Information Professional Development in Latin America;

2) Institutional Linkages between North American and Latin American Industrial Information Organizations;

3) Technical Assistance in Latin American Industrial Information Organizations;

4) Mechanisms for Regional Cooperation among Latin American Industrial Information Organizations;

5) Extension of Industrial Information from Latin American Industrial Information Organizations to Latin American Industry;

6) Development of Information on Sources of Industrial Information for Particular Use in Latin America;

7) Development of Knowledge about National Markets for Industrial Information in Latin America;

8) Development of Local Public and Political Support for Industrial Information in Latin America.

As might be expected, the discussion groups produced dozens of action recommendations and suggested programs and projects to be executed at the national and international level. A draft report of this October 1976 meeting was circulated to the participants in June 1977 by the Denver Research Institute. It is expected that the final report will be used as a basis for the participating countries to seek technical and financial support for action from their own governments and from international sources. Items 2 and 4 of the above list are obviously concerned with some form of regional information networks in the Western Hemisphere.

As indicated above, one of the co-sponsors of these conferences was the FID/CLA/II. The Information for Industry Section of the Latin American Committee of FID is an informal and unofficial group of individuals concerned with the information problems of industry. Its membership

/is voluntary

is voluntary and these individuals do not and cannot formally represent the institutions they work for or their governments. The "membership" based on attendance at two or three meetings may include as many as fifty members coming from a dozen or so Latin American countries plus the U.S. and Canada. The current President of FID/CLA/II is José Quevedo, Executive Director, INFOTEC/CONACYT, Mexico. FID/CLA/II and the institutions, its members represent informally, could be one basis for organizing a Latin American technical information exchange network.

The OAS "Group of Experts" (in Tech. doc 18, 21 April 1977) outlined the objectives of an Inter-American Program of Cooperation in the Creation, Adaptation and Transfer of Technology. A major area of regional cooperation to support this program is technical information. The OAS budget for Special Projects under the Mar del Plata Resolution for Technical Information and Assistance to Industry was $812 400 in 1974/1975, $861 000 in 1975/1976 and estimated to be $584 600 for 1976/1977. Other technical information projects of the OAS amount to about $300 000 per year. It is anticipated that the OAS General Assembly, which met in Grenada in June 1977, might approve a new program in science and technology and related information activities. A report on this is not available at this writing (July 7, 1977).

III. DISCUSSION OF DEFINITIONS AND RELATIONSHIPS BETWEEN INFORMATION SYSTEMS AND NETWORKS

A. Schematic, description and discussion of information creation, publication, distribution and use-supply and demand

1. Introductory Discussion of Exhibit I; Technical Information creation, publication, distribution and use-supply and demand

This schematic, with its seven components and eleven lettered connecting links, can be called an "information system". As a minimum, an information system has two components - the creator of information and the user - components 1 and 7. Components 2 through 6 may or may not exist in an information system and may or may not be available to creators or users of information. In many respects, if a user is not aware of the existence of any of the components 1 through 6, they may as well not exist. He cannot use what he is not aware of, cannot find or cannot contact.

Such an information system can be simple or complex, broad or narrow in substantive or geographic scope, and used by many people or by only a few specialists, depending upon its purpose, clientele, and the resources available to support its operation on both the supply and demand sides. The system may be formally or informally organized, but in either case depends largely on voluntary cooperation for its effectiveness given minimum financial resources.

Several, or many, such information systems may exist in a given country. They may be operated by universities, government agencies, research institutions, private companies, specialized information service organizations or by technical or professional associations. Some will be general in nature, such as public, government, and university libraries, while others will be specialized, tailored to the needs of an industry, profession, discipline, market, material, other specific interest or by geographic area.

When three or more information systems are connected or exchange information, either formally or informally, we can say that they form an "information network" (bilateral arrangements should hardly be

considered "networks"). Since each information system has between two and seven components, any of which may contact any component in the other system(s), we can see that combinatorially there are a very large number of interconnections or linkages possible within an information network. In practice, all of these linkages are used at one time or the other, especially on an informal basis.

When the volume of information exchanged or requests for information becomes large, "formal" relationships between information systems may become advisable for reasons of convenience, effectiveness, efficiency and economy. These formal relationships will not directly involve all components of each information/system but usually only the information centers and/or switching/referral centers. These in turn forward requests for information and the answers to the proper parties within their systems. Networks may be local, regional, national or international, and may be of a generalized or specialized nature, depending on their content, purpose and intended clientele.

(It must be pointed out that formal networks or systems are not necessary for the transfer of information. Users may, and do, obtain information by whatever means and channels available to them, formal, informal, legal or illegal.)

Formal information systems and networks are created as matters of policy, prudence, necessity or demand by public and private organizations, institutions, and associations for a variety of cost/benefit/effectiveness reasons. But formality is neither necessary or desireable in many situations, depending on the magnitude of effective demand for specific types of information, the availability of appropriate information and delivery systems, and the perceived necessity or mandate for the formal organization of information structures.

2. Description of the seven components and eleven links in the shematic of technical information creation, publication, distribution and use-supply and demand (Exhibit I)

a) Information Creation Component

Technical information is created by individuals in the process of solving technical problems. It is usually a by-product, especially in industry where problem-solving rather than publication is the primary task. Most technical information generated in industry is not in a publishable form and in many cases is proprietary for economic and marketing reasons. Technical information which may lead to a patent is usually highly confidential for obvious reasons. Companies and research agencies may or may not publish technical reports and data, or may restrict its distribution to licenses, special categories of customers or associates, or may release it on a contract or fee basis. The creation of information may be considered a voluntary action, hence not subject to production on command, except in certain academic or governmental environments.

An important category of unpublished information relates to so-called "appropriate" or "intermediate" technology. Unfortunately, much of this information has not, and will not, be reduced to writing as it exists only in practical form, personal skills or "know-how".

The identification of this type of information poses special problems which are receiving increased attention in both developing and developed countries. As it is developed, information on "appropriate technology" is finding its way into the formal literature and information systems.

b) Publication, Public Presentation or Reporting Component

As indicated above, a piece of technical information, data or patent may enter the public domain in several ways - through formal publication in a journal, monograph or proceeding, by presentation at a seminar or public speech, and/or by being reported on or written up in a journal, magazine, newsletter, or on teletype or a TV show.

/Link A.

Link A. The "publication" link. Once published, information may be available at some price, or with no charge. Formal publication of information may be at the discretion of the creator, may be a legal or academic requirement, or may be a matter of professionalism, promotion, public relations, commercialism, or to satisfy other individual or institutional ends.

Since publication is a discretionary action, some information of potential use never appears in public and thus is not indexed, abstracted or collected by information centers. For practical public purposes this information does not exist. It may be elicited on a personal basis, however, in an interview, for example, but this would not necessarily constitute "publication" of the information rendering it accessible to the public.

Other information is "restricted" - it exists and may be in published form, but it is not made available nor published (except sometimes for a price) because of legal, competitive, proprietary, security, economic, institutional or personal reasons. Access to such information presents a variety of issues and problems, as a function of its specific type, uses and purposes. Since this kind of information usually does not enter the public domain, is not available through conventional channels and information systems, and would require specialized treatment, it is not discussed further herein. WIPO (World Intellectual Property Organization) is specifically concerned with this problem.

Link B. The "collection" link. Information, once published, may be acquired, catalogued and stored in accessible form in one or more "information centers". Whether or not a given piece of published information finds its way into an information center or library may again be a discretionary matter - by design or by change. The purposes, resources and clientele of information centers determine criteria for the kind and quantity of information they attempt to collect. By design an information center will not collect certain kinds of information - by chance, or due to resource limitations, it may fail to find and add information within its assigned scope.

/C. Indexing

c) Indexing, Abstracting Services Component

Many technical items published in the open literature find their way into a variety of indexing and abstracting publications and services, including technical journals and trade publications. The criteria for inclusion in indexing/abstracting media are quite diverse and the time lag between initial publication, announcement or reporting may take many months.

Link C. The "indexing" link. Much published information is indexed and/or abstracted and published in specialized journals, in sections of other journals, in newsletters and in other publications, such as the Science Citation Index, which indexes cited papers and the published sources which cite them, or the Government Reports Announcements of the U.S. National Technical Information Service. The U.S. Engineering Index is a monthly publication of some 5 000 abstracts selected from 3 500 journals from all over the world. The magnetic tape version of this index is called COMPENDEX. There are several hundred indexing and abstracting services available in nearly every field of science and technology.

Indexing and abstracting publications are invaluable guides to general and specialized information and are the starting point for most literature searches. These services and publications are available on a fee or subscription basis, to individuals, corporations and institutions, public or private, and are in wide use in Latin America. In some instances there are restrictions on re-sale or re-distribution of publications or services, but these are largely administrative issues that can be resolved at the national level to assure user access to necessary technical information.

Link D. This is the same information "collecting" link as B above, but refers to the activities of a Specialized Information Center which concentrates on a specific technical subject, field, discipline, mission or other narrowly defined purpose. Examples include agriculture, food technology, electronics, petrochemicals, pollution, environmental control, metallurgy, mining, road construction, etc.

/Links E

Links E and G. These links represent the distribution, almost always for a price, of indexing and abstracting services and publications to information and referral centers. While the cost of some of these publications is relatively small - perhaps a hundred dollars a year - others, such as Chemical Abstracts and computer tape service cost thousands of dollars a year, plus mailing costs.

d) General Information Center Component

This refers to an institution that collects a rather broad assortment of technical information, such as a public, university or a national library. The scope of its services may be quite limited although it may provide referral and other services such as training in the use of information systems.

e) Specialized Information Center Component

This is an institution which is specifically designed to serve a well defined set of users. This set may be defined by subject, discipline, industry or industry sub-sector, or may be mission oriented, concerned with health, education, housing, the environment, communications, etc. Major functions performed by Specialized Information Centers include the following:

1) Acquisition of books, documents, audio-visual materials, patents, serials, theses, proceedings, patents, data, tapes, microforms (film, fiche, aperture cards), etc., according to established criteria.

2) Systematic identification of acquisitions, including indexing, cataloguing, cross-referencing, etc.

3) Systematic storage of acquisitions to ensure ease of access, reproducibility, protection, etc.

4) Reference and enquiry services - personal, phone, mail, telex, automated (batch or on-line).

5) Literature searches, manual, automated (batch or on-line).

6) Compilation of bibliographies, manual or automated.

7) Information analysis: this service is concerned with acquiring, selecting, storing, retrieving, evaluating, analyzing, and synthesizing a body of information and/or data in a clearly defined specialized field, or pertaining to a specified mission. This material is then compiled, consolidated, digested and repackaged or otherwise organized to present pertinent information and/or data in an authoritative, timely and useful form to a specified audience. State-of the art reviews are one product of information analysis centers, which are staffed by well qualified subject specialists.

8) Current awareness services by mission, subject, discipline, or sectorial emphasis.

9) Selective Dissemination of Information (SDI) - based on tailor made user profiles.

10) Collection and dissemination of technical or scientific data.

11) Translations.

12) Register of research activities and projects, programmes - past, present, planned.

13) Register of research and consulting organizations and areas of competence.

14) Register of researchers and areas of competence.

15) Technical assistance - diagnosis, trouble shooting, etc.

16) Reproduction services - documents, fiche, tape, card, etc.

17) Publications: promotional, accessions, bibliographies, technical meetings, reviews, state-or-art reports, indexes (KWIC) etc.

18) Exchange of publications, national and international.

19) Inter-library loans, national and international.

20) Training of information center staff, users, and at all levels in the educational system (these are the people who will need and use the information system in the future) in the use of information and of information systems.

The schematic which follows illustrates how a specialized information center could be organized to serve a specific user group. While users

would always have direct access to the various operational centers within the information center, members of the Extension Service Staff would always be available to supply technical assistance and to ensure the best utilization of center's resources and capabilities. It has been the experience of technical information systems throughout the world, in both advanced and developing countries, that active, aggressive and dynamic extension services are absolutely necessary in order for the technical information center to succeed. If the technical information center is passive, it will be ignored and its expensive resources will be under-utilized and wasted.

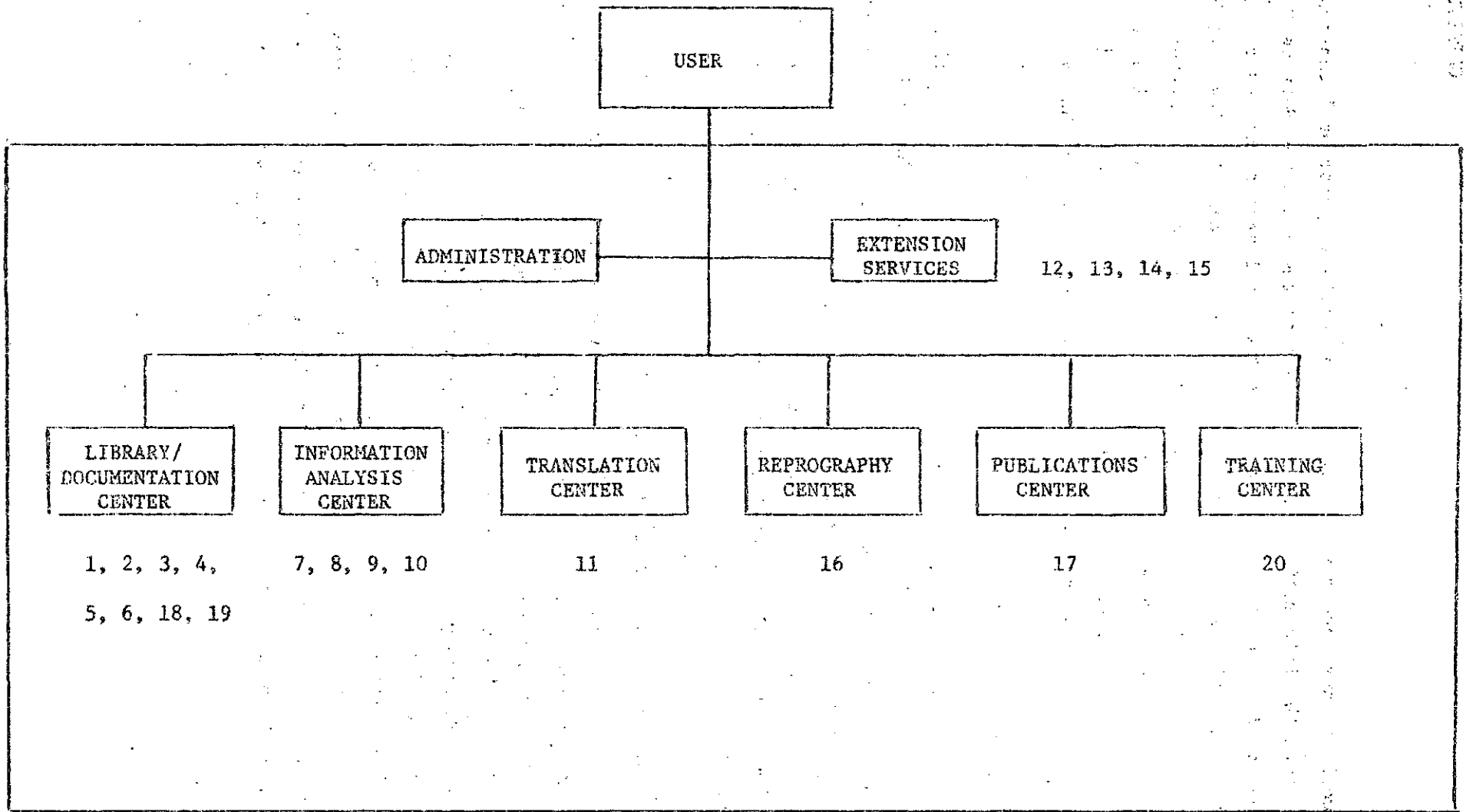
Links F, H and I. These links represent the communication, not of substantive technical information per se, but of descriptions of the kinds of information available in information centers and from indexing and abstracting services that is used by Switching or Referral Centers. This is "information about information". Of course, the referral sections of generalized and specialized information centers use similar source and directory material.

f) Switching/Referral Center Component

The purpose of switching or referral centers is not to solve technical problems, but to tell a person where to go, or who to ask, in order to obtain the technical information required. The referral center will tell a person to contact a specific individual, company, association, index, directory, academic or research institution, government agency, or information center which should have the technical information needed or leads thereto. Switching or referral centers primarily contain information about sources of technical information and are extremely useful if they are available and are well stocked with suitable directories, guides to ongoing research and other technical information sources.

/SCHEMATIC

SCHEMATIC OF INFORMATION SERVICES



/As a

As a minimum they should contain directories and similar guides to information sources covering:

- Products
- Processes and equipment
- Materials
- Industrial companies, manufacturers, suppliers, marketers, etc.
- Technical, trade and professional associations, and their membership
- Technical services and consultants, by subject: industrial management, quality control, engineering, cost analysis, materials handling, product and process design, operations research, marketing, training, packaging, etc.
- Directories of publications, periodicals, technical meetings, information centers, indexing and abstracting services, etc.
- Government directories and organization manuals.

g) Information Requestor/User Component

This component represents the demand for technical information. The requester/user is an individual who represents himself (as a student, researcher, teacher or investor) or represents a company, laboratory, university, government agency or other institution. The requestor/user may be well trained or unsophisticated in his field, and may have little or much experience in the effective use of technical information systems. These characteristics of the user are important in creating effective demand for information services and can strongly influence the development of useful and responsive information systems.

Link J. Links A through I, and the components they connect, describe the supply side of information creation, publication, distribution and availability. Link J is the channel which, hopefully, will connect a user with the information he needs to solve a specific technical problem. It is important to note that Link J has six possible alternative routes to obtain the desired information nationally.

The user/requestor can go directly to the creator of the desired information, if he knows who and where he is and how to reach him - by phone, mail, or personal contact. One advantage of this direct approach is that the information may be clarified, modified or expanded during the contact, and also unpublished, and sometimes, restricted information may also be obtained this way. Contacts by the user/requestor with any or all of the five other sources of information follow customary "question and answer" procedures, assuming these sources exist, are readily available, and potentially contain the kind of technical information desired.

Link K. Same as J except it is the channel through six possible alternative routes to obtain the desired information from international sources.

Thus a user has a total of twelve possible sources of technical information.

B. Types of Technical Information Networks

A useful typology of information systems and networks was developed by David Liston and Mary Schoene of Battelle Colombus Laboratories and presented in their May 1971 report to the OAS "Elementos Básicos de la Planificación y Concepción de los Sistemas de Información Regional" (see Exhibit II).

They posit four principal alternative forms for information organizations: the monolith, the "free-form" network, the coordinated network and the agglomerated network (which may be free-form or coordinated).

The monolith (Item a. in Exhibit II) is a system designed to satisfy the information needs of a specific group of users. It contains all the components and functions portrayed in Exhibit I: Technical Information creation, publication, distribution and use-supply and demand, with emphasis on the role of the Specialized Information Center.

The "free-form" network (Item b. in Exhibit II) illustrates the informal linking of information systems by all possible connections. Item c. in Exhibit II presents a "coordinated network" involving a central information function of some kind connecting the components of the network.

As shown in Exhibit II, agglomerated networks may be either "free-form" or coordinated. The former would be informal whereas the latter would be formally coordinated by agreement, convention or legislation. International networks take these latter two forms.

While Item a. in Exhibit II, the monolith, is essentially equivalent to the information system presented in Exhibit I with its seven components, ambiguity and confusion arises when one considers what the small circles or nodes in Items b, c, d, and e may represent. Depending on the emphasis of a particular discussion, the nodes in the items can represent any one of the seven components in Exhibit I. In other words, Items b, c, d and e can be networks: only of users; only of information creators - individuals, institutions, corporations; only of indexing services; only of information centers; or only of switching referral centers. "Networks" of these kinds exist - as professional associations, national information systems, inter-library loan services, etc.

/Items b,

Items b, c, d and e of Exhibit II can also represent combinations of different components from Exhibit I. For example, in Item b, each of the six nodes, could be a different information system component related in a "free-form" fashion. Item c could represent six Specialized Information Centers as the peripheral nodes, each connected to a Switching/Referral Center in the middle. In this case, the peripheral Information Centers could all be within one country or in different countries.

The five items in Exhibit II present the universe of network forms - but the nature and contents of each node with their diverse combinatorial possibilities expand this universe greatly.

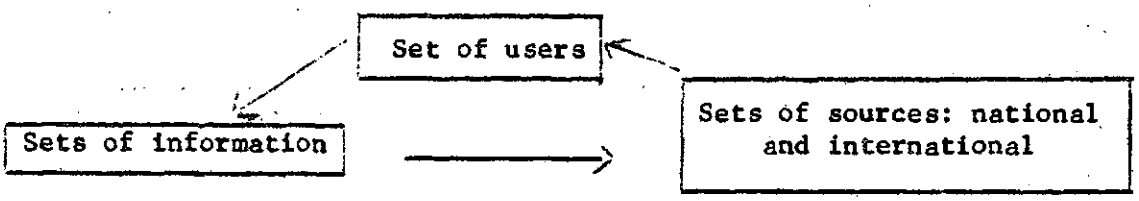
In practice, "free-form" unorganized "networks" exist whenever three or more individuals, institutions or other kind of organization communicate with each other. The "invisible colleges" of academic, professional and technical peers who regularly exchange ideas and information nationally and internationally is a common example of a "free-form" network. The membership of associations of all kinds also constitute a "free-form network". These are significant because they arise naturally from a common interest, often develop into more formal information systems, the American Chemical Society and its Chemical Abstracts for example, and also provide the basis, later, for more formal international networks, when justified by demand or other considerations.

/C. Some

C. Some Comments and Questions on "International Networks"

What is the United Nations referring to when it uses the phrase "international networks"? Since the United Nations wants to involve all sources of information and all users on a voluntary, cooperative basis, it must be referring to all possible kinds of networks and cannot exclude any formal, informal, free-form or what have you. (UN ECOSOC Report E/5839, 14 June 1976, paragraph 76 b.)

The guidelines for information system and network development are provided for by identifying the demand of a specific set of users for specific sets of technical information from more or less specific sets of sources, and then designing, organizing and/or coordinating a system to supply and deliver that information. If some sources are international, then you have an "international" system or "network".



It would seem that the phrase "international network is being used as a substitute for the phrase "information service".

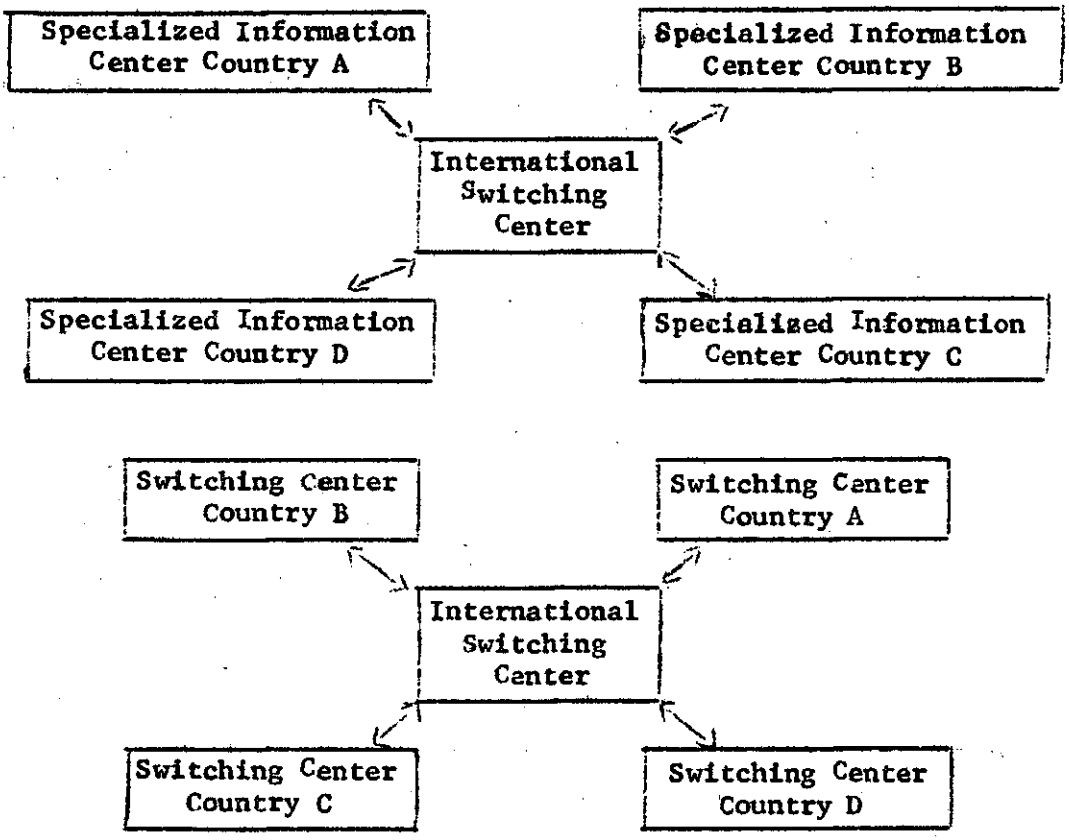
If an "information service" has been collecting information on information and making it available to requestors on an international scale, is one justified in calling this service a "network"? This adds confusion rather than clarity. UNIDO has been providing technical information services for years. What is gained by calling it a "network"?

What could "international information networks" consist of? They could consist of sets of components from Exhibit I.

Many such sets exist today. They are international publishing firms, international indexing and abstracting companies, computer based information supply systems, and a variety of international associations and organizations that publish technical information. Each of these has components operating in several countries and therefore can be considered "international networks".

/But the

But the United Nations is seeking something else. I believe what the United Nations is looking for in its approach to "international information networks" are sets of national Specialized Information Centers or sets of national Switching Referral Centers organized on a coordinated basis as illustrated in Items c) and e) of Exhibit II.



(Section III. D. which follows presents an outline for the Design of International Technical Information Networks (ITIN). This outline may be useful in further discussions of issues and problems in the development of "formal" international information networks.)

/What questions

What questions or requests would we not ask of a network?

We would not ask an international network for information that was available nationally - we would always exhaust national information resources before going outside.

(The existence of a useful and responsive international network should not be used as a substitute for, or as an excuse not to develop, national information systems and networks.)

We would not ask an international network for information that was available directly from a known source, i.e. for a specific document, bibliography, state of the cost study, etc., available from a publisher, reprint service, lending library, or other kind of information center or service.

(The less developed, equipped and experienced a national information center is, the more likely it is to ask a network this kind of question.)

What kind of questions should one ask of a network?

- For a copy of a specific document, publication, book, patent, etc. giving the complete citation (title, author, publication name, issue, number, date, page numbers, etc.). (It is assumed that this information is not available in the questioner's network or country, which fact he has verified, and that it is not available directly from other sources.)

- For suggested sources of information (documents, companies, research institutions, etc.) in order to answer a very specific technical question. If the question is broad, vague or non-specific, it may not be responded to, or will generate too much documentation which may be too expensive to send out and may require entirely too much time and expense to analyze, if it is received.

- The network could be asked to contact a specific type of company or research institution to obtain the answer (or leads) to a very specific technical question. In this instance, the questioner has a very good idea as to the type of organization that is doing relevant production or technical research/development work and is likely to have the kind of information sought.

- The network could be asked if there were any recent literature searches or bibliographies, or state-of-the-act studies available on a specific subject.

/A formal

A formal network is the "court of lost resort" - the place where one would go only after exhausting all other possible sources of the desired information.

The international network is therefore a form of "super switching/referral center".

It would not contain the reference material and directories common to national switching/referral centers, for this would be wasteful redundancy.

What it would, or should contain then is the very newest, freshest information on information that could be of use to its members. While this kind of information would sooner or later find its way into national information and switching/referral centers, the network's "super switching referral center" would attempt to capture this information as quickly as possible after its creation. In practice, this would only happen if its members voluntarily sent such information to the network headquarters immediately after it is published or announced. The network headquarter would then pass it on to the other members.

In a very real sense, such a network headquarters would rarely be asked for information because its members would receive new information continuously and be kept up-to-date, except for the lag and delay of the mail. This assumes telecommunications to be too expensive initially - later, if demand and volume warranted it, and resources were available, a variety of telecommunication links could be considered.

As a matter of fact, there are a handful of documentation, library and information journals that perform this function on a regular basis. They routinely announce and/or review reference material, sources and programs that supply or create new information in all fields of human endeavor. It is the responsibility of information center to obtain this material, carefully review it, and advise their clientele of its existence and availability.

/D. An Outline

D. An Outline for the Design of International Technical Information Networks (ITIN)

1. Organization of the ITIN Task Force

a) ITIN Steering Committee

To oversee and guide the planning, development, coordination and implementation of ITIN activities, a high level, broadly based International ITIN Steering Committee should be established. The Committee will represent the countries and the major groups of users, public and private, as well as the institutions and agencies, that will be concerned with the supply of STI (scientific and technical information) from national and international sources, with its dissemination, and with the administration of ITIN operations. The ITIN Steering Committee will:

1) define the scope, purposes, goals, and major policies of the ITIN Development Program;

2) arrange for required institutional, personnel, material and financial support; and

3) monitor and evaluate the progress of the ITIN Development Program.

b) Responsible ITIN Agency

The ITIN Steering Committee will select or create, and appropriate organization that will be responsible for the design and execution of ITIN Development Program. The Steering Committee will assure the availability of necessary resources and authority to the responsible agency that are fully commensurate with the assigned responsibilities.

c) Responsible ITIN Agent

The responsible ITIN agency will designate, or employ, a well qualified, dedicated, highly motivated, experienced manager who will be personally accountable for planning, developing and implementing the ITIN Development Program. Since major difficulties in the development

/and operation

and operation of STI systems and networks are more often institutional and behavioural rather than technical, an important personal characteristic of the Responsible Agent is demonstrated human relation skills.

d) ITIN Consultants

The Responsible Agent should be authorized to employ the services of qualified STI and network contultants to assist in any aspect of ITIN activities.

2. Suggested Plan for the ITIN Development Program

The plan for the ITIN Development Program can be divided into six phases:

1) Organization of the ITIN task force,
2) Selection of sector(s) for ITIN development,
3) Design of ITIN network(s),
4) Development and installation of network(s),
5) Start-up and operation of network(s),
6) Evaluation and modification of network(s).

The specific content of each phase will be dependent upon the actual state and conditions of national STI and network situations:

a) at international, national, regional and local levels;

b) within and between the public and private institutions concerned with STI and its supply; and

c) as a function of the stage of maturity of effective demand for STI and network services by various user groups, the degree of user satisfaction, and relevant cost/effectiveness considerations.

3. Phase 1: Organization of the ITIN Task Force

a) Tasks to be accomplished for and by the ITIN Steering Committee:

i) Identify appropriate institutions, public and private as well as individuals, who should be considered as members of the ITIN Steering Committee. Substantive rather than formal, participation is a necessity if an effective ITIN Development Program is to be designed and implemented.

/ii) Select

ii) Select the ITIN Steering Committee and obtain necessary government and institutional agreements and approvals. The Responsible Agency should be represented on the Steering Committee.

iii) Convene working meetings of the ITIN Steering Committee in order to:

1) Organize the Committee;

2) Define the scope, purpose, goals, timing and major policies of the ITIN Development Program, with special emphasis on the coordination of existing STI institutions, programs and operations (this activity should include the participation of the Responsible Agency);

3) Arrange for necessary institutional, personnel, material and financial support;

4) Select or create a Responsible ITIN Agency that will be responsible for the design and execution of the ITIN Development Program;

5) Assure the availability of necessary resources and authority to the Responsible Agency that are fully commensurate with the scopes and nature of the ITIN Development Program;

6) Communicate the formal statement and description of the ITIN Development Program to the Responsible Agency, and the Responsible Agent (if he has been selected), for action.

7) Schedule periodic review meetings, and written progress re report due dates, with the Responsible Agency. It is to be understood that the ITIN Steering Committee, and/or designated sub-committees, will be available for ad-hoc meetings whenever necessary.

iv) Monitor and evaluate the progress of the ITIN Development Program.

b) Tasks to be accomplished by the Responsible Agency:

i) Participate in the meetings of the Steering Committee which define the scope, purpose, goals, timing and major policies of the ITIN Development Program;

ii) Organize Agency resources, internal as well as those made available by the Steering Committee, to support the ITIN Development Program.

/iii) Appoint

iii) Appoint a well qualified, experienced manager, the Responsible Agent, who will be personally accountable for planning, developing and implementing the ITIN Development Program;

iv) Provide administrative, technical and intellectual support to the Responsible Agent, including use of consultants as required;

v) Collaborate with the Responsible Agent in preparing working plans and reporting schedules consistent with ITIN Development Programs and policies as defined by the ITIN Steering Committee,

vi) Monitor and evaluate the progress of the Responsible Agent and make periodic reports to the ITIN Steering Committee.

c) Tasks to be accomplished by the Responsible Agent:

i) Prepare a working plan and reporting schedule consistent with the resources available and with the ITIN Development Program and policies as stated by the ITIN Steering Committee. The plan may include the use of Agency Staff, international and national government personnel, and consultants. The plan is to be spproved by the Responsible Agency and the ITIN Steering Committee.

ii) Execute the approved working plan and reporting schedule. The Working plan will provide for:

1) Utilization of prior studies of networks and national STI Situations

2) Determination of current status of international networks and of national STI recources and systems;

3) Selection of sector(s) for ITIN development;

4) Design of ITIN system(s);

5) Development and installation of ITIN system(s)

6) Start-up and operation of ITIN system(s)

7) Evaluation and modification of ITIN system(s), and will include

8) Cost and time estimates (budgets and schedules).

/4. Phase 2:

4. Phase 2: Selection of Sector(s) for ITIN Development

(As indicated in Section 2 above, the specific content of each phase is dependent upon the actual state and conditions of national STI and network situations:

a) At international, national, regional and local levels;

b) Within and between the public and private institutions concerned with STI and its supply; and

c) As a function of the stage of maturity of effective demand for STI and network services by various user groups, the degree of user satisfaction, and relevant cost/effectiveness considerations.

This phase has five steps:

i) Examination and utilization of prior studies of the ITIN situation;

ii) Determination of the current states of national and international STI resources and systems;

iii) Identification of basic ITIN services to be provided;

iv) Development of criteria for evaluating existing and potential needs, wants, costs, effectiveness, benefits, etc., of various national scientific, industrial, institutional or commercial sectors for ITIN services. These criteria will be developed in collaboration with the Responsible Agency, existing national and international STI institutions, and user groups;

v) Application of these criteria to select one or more sectors for which to design an ITIN system(s). The sector(s) selected may be oriented by mission (health, housing, environment, communication, etc.) or by subject, discipline, industry, depending on real user needs, potential benefits, costs, relative ease of implementation, and other criteria. An illustrative classification of 178 sectors follows. This phase may take anywhere from two to six months, depending on the current STI and network situation, amount of relevant prior work and information readily available, travel required, availability of personnel and material to be consulted, etc. The sector(s) selected for network design and development will be approved by the Responsible Agency and the ITIN Steering Committee before further efforts are begun.

/Illustrative

Illustrative Classification of Possible ITIN Sectors

Subject Category Fields and Groups

01 Aeronautics
- *01 01
- 01 02 Aeronautics
- 01 03 Aircraft
- 01 04 Aircraft flight instrumentation
- 01 05 Air facilities

02 Agriculture
- 02 01 Agricultural chemistry
- 02 02 Agricultural economics
- 02 03 Agricultural engineering
- 02 04 Agronomy and horticulture
- 02 05 Animal husbandry
- 02 06 Forestry

03 Astronomy and astrophysics
- 03 01 Astronomy
- 03 02 Astrophysics
- 03 03 Celestial mechanics

04 Atmospheric sciences
- 04 01 Atmospheric physics
- 04 02 Meteorology

05 Behavioral and social sciences
- 05 01 Administration and management
- *05 02 Information sciences
- 05 03 Economics
- 05 04 History, law, and political science
- 05 05 Human factors engineering
- 05 06 Humanities
- 05 07 Linguistics
- *05 08
- 05 09 Personnel selection, training, and evaluation
- *05 10 Psychology
- 05 11 Sociology

06 Biological and medical sciences
- 06 01 Biochemistry
- 06 02 Bioengineering
- 06 03 Biology
- 06 04 Bionics
- 06 05 Clinical medicine
- 06 06 Environmental biology
- 06 07 Escape, rescue, and survival
- 06 08 Food
- 06 09 Hygiene and sanitation
- *06 10
- 06 11 Life support
- *06 12 Medical equipment and supplies
- 06 13 Microbiology
- 06 14 Personnel selection and maintenance (medical)
- 06 15 Pharmacology
- 06 16 Physiology
- 06 17 Protective equipment
- 06 18 Radiobiology
- 06 19 Stress physiology
- 06 20 Toxicology
- 06 21 Weapon effects

07 Chemistry
- 07 01 Chemical engineering
- 07 02 Inorganic chemistry
- 07 03 Organic chemistry
- *07 04 Physical and general chemistry
- 07 05 Radio and radiation chemistry

08 Earth sciences and oceanography
- 08 01 Biological oceanography
- 08 02 Cartography
- 08 03 Dynamic oceanography
- 08 04 Geochemistry
- 08 05 Geodesy
- 08 06 Geography
- 08 07 Geology and mineralogy
- 08 08 Hydrology and limnology
- 08 09 Mining engineering
- 08 10 Physical oceanography
- 08 11 Seismology
- 08 12 Snow, ice and permafrost
- 08 13 Soil mechanics
- *08 14 Geomagnetism

09 Electronics and electrical engineering
- 09 01 Components
- 09 02 Computers
- 09 03 Electronic and electrical engineering
- 09 04 Information theory
- 09 05 Subsystems
- 09 06 Telemetry

*10 Nonpropulsive energy conversion
- 10 01 Conversion techniques
- 10 02 Power sources
- 10 03 Energy storage

11 Materials
- 11 01 Adhesives and seals
- 11 02 Ceramics, refractories, and glasses
- 11 03 Coatings, colorants, and finishes
- 11 04 Composite materials
- 11 05 Fibers and textiles
- *11 06 Metals
- 11 07 Miscellaneous materials
- 11 08 Oils, lubricants, and hydraulic fluids
- 11 09 Plastics

/11 10 Rubbers

11 10 Rubbers
11 11 Solvents, cleaners, and abrasives
11 12 Wood and paper products
*11 13 Corrosion and degradation

12 Mathematical sciences
12 01 Mathematics and statistics
12 02 Operations research

13 Mechanical, industrial, civil, and marine engineering
13 01 Air conditioning, heating, lighting, and ventilating
13 02 Civil engineering
13 03 Construction equipment, materials, and supplies
13 04 Containers and packaging
13 05 Couplings, fasteners, and joints
13 06 Ground transportation equipment
13 07 Hydraulic and pneumatic equipment
13 08 Industrial processes
*13 09 Machinery, tools, and industrial equipment
13 10 Marine engineering
13 11 Pumps, filters, pipes, tubing, and valves
13 12 Safety engineering
13 13 Structural engineering

14 Methods and equipment
14 01 Cost effectiveness
14 02 Laboratories, test facilities, and test equipment
14 03 Recording devices
14 04 Reliability
14 05 Reprography
*14 06 Research
*14 07 General concepts
*14 08
*14 09 Geometric forms

15 Military sciences
15 01 Antisubmarine warfare
*15 02 Chemical, biological, and radiological operations
15 03 Defense
15 04 Intelligence
15 05 Logistics
15 06 Nuclear warfare
15 07 Operations, strategy, and tactics

16 Missile technology
16 01 Missile launching and ground support
16 02 Missile trajectories
16 03 Missile warheads and fuzes
16 04 Missiles

17 Navigation, communications, detection, and countermeasures
17 01 Acoustic detection
17 02 Communications
17 03 Direction finding
17 04 Electromagnetic and acoustic countermeasures
17 05 Infrared and ultraviolet detection
17 06 Magnetic detection
17 07 Navigation and guidance
17 08 Optical detection
17 09 Radar detection
17 10 Seismic detection
*17 11 Miscellaneous detection

18 Nuclear science and technology
*18 01
18 02 Isotopes
18 03 Nuclear explosions
18 04 Nuclear instrumentation
*18 05
18 06 Radiation shielding and protection
18 07 Radioactive wastes and fission products
18 08 Radioactivity
*18 09 Reactor technology
18 10 Reactor materials
18 11 Reactor physics
*18 12
*18 13
*18 14

19 Ordnance
*19 01 Ammunition, explosives, and pyrotechnics
19 02 Bombs
19 03 Combat vehicles
19 04 Explosions, ballistics, and armor
19 05 Fire control and bombing systems
19 06 Guns
19 07 Rockets
19 08 Underwater ordnance

20 Physics
20 01 Acoustics
20 02 Crystallography
20 03 Electricity and magnetism
20 04 Fluid mechanics
20 05 Masers and lasers
20 06 Optics
20 07 Particle accelerators
*20 08 Particle physics and nuclear reactions
20 09 Plasma physics
*20 10 Quantum theory and relativity
*20 11 Mechanics
20 12 Solid state physics
20 13 Thermodynamics
20 14 Wave propagation

*21 Propulsion, engines, and fuels
*21 01
21 02 Combustion and ignition
21 03 Electric propulsion
21 04 Fuels
21 05 Jet and gas turbine engines

21 06 Nuclear propulsion
21 07 Reciprocating engines
*21 08 Rocket engines
21 09 Rocket propellants
*21 10 Engine components
*21 11 General engine concepts
*21 12 General propulsion concepts

22 Space technology
22 01 Astronautics
22 02 Spacecraft
22 03 Spacecraft trajectories and reentry
22 04 Spacecraft launch vehicles and ground support

*Indicates where changes were made to the present *COSATI Subject Category List.*

The 22 Subject Category Fields and 178 Groups listed above was prepared by the Committee on Scientific and Technical Information (COSATI) of the Federal Council of Sciences and Technology to index research and development projects and reports supported by the U.S. Government. The index is complemented by the Thesaurus of Engineering and Scientific Terms (TEST) which includes over 23 000 main entries covering all areas of science and technology. (TEST is published by the Engineers Joint Council, New York). The TEST vocabulary is used by the National Technical Information Service (NTIS) of the Department of Commerce in reporting and indexing U.S. Government research. NTIS has a collection of over 750 000 documents to which more than 60 000 reports are added every year.

5. Phase 3: Design of ITIN System(s)

a) The contents of this phase will be determined by the findings and selections made in Phase 2: Selection of sector(s) for ITIN development. The potential ITIN users within the selected sector(s) may be widely or narrowly dispersed geographically; may have a broad or narrow range of technological knowledge; may require extensive training in ITIN utilization; may need simple or complex technical assistance; may need many translations from several languages, etc. Thus the character of "profile" of the selected user groups and countries, as well as the state of development of, and degree of satisfaction with existing ITIN services to those countries and groups, will establish the design parameters for the ITIN supply system.

b) The ITIN system design phase has three major steps:

1) Survey ITIN and technical assistance needs (in terms of the basic ITIN services to be provided), short and long range, of the selected countries and user group(s) and ascertain what needs are (not) being met and to what degree they are considered satisfactory. This survey establishes estimates of ITIN system demand.

The survey may take three to six months, depending on the size, location and sophistication of the users, and on the scope, frequency, complexity and depth of ITIN services desired.

2) Determine the scope, content, and estimated cost of ITIN resources needed to supply and satisfy estimated country and user demands for each of the ITIN basic services, information materials (directories, guides, abstracts, subscriptions, tapes, etc.), equipment, number and qualifications of necessary staff, training, mail and communication costs, etc. This step will take 1 to 2 months and overlaps 1) above.

3) Prepare an ITIN organization plan which systematically structures the resources identified in 2) above. This plan will include a development schedule for procurement, staffing and training and an estimated budget for the first five years of operations. Possible cost sharing modes and sources of funds will be identified. This step will take one month.

/6. Phase 4:

6. Phase 4: Development and Installation of Network(s)

This phase will follow the plan laid out in the Design Phase 3. The duration of this phase cannot be determined a priori as it is a function of the scope, nature and content of the ITIN system design itself, including procurement, staffing and training lead-times.

7. Phase 5: Start-up and Operation of Network(s)

Since this phase begins at the end of Phase 4, its timing will be determined by Phase 4, and cannot be established a priori.

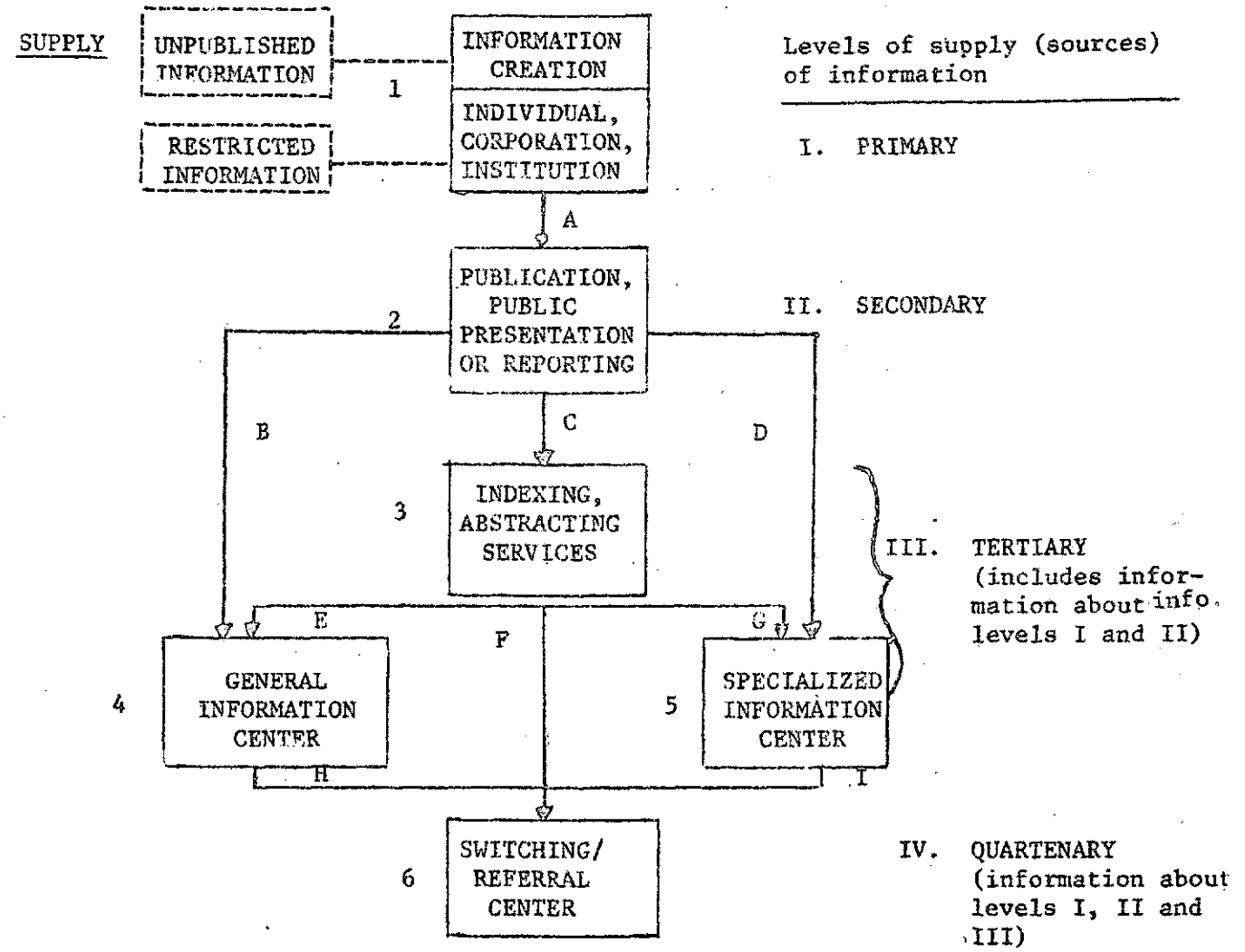
8. Phase 6: Evaluate and Modify Network(s)

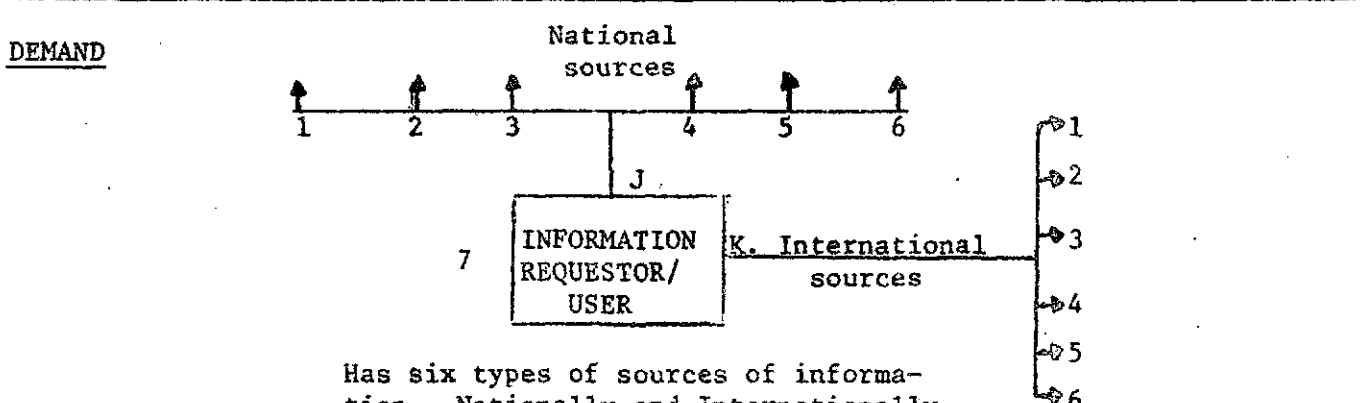
a) During the course of Phases 3, 4 and 5, the ITIN Development Program will be monitored by the ITIN Steering Committee and the Responsible Agency on a periodic basis, in addition to their review of the scheduled reports submitted by the Responsible Agent.

b) At specific times scheduled by the Responsible Agency, formal reviews and evaluations of the operation of the Network(s) will be conducted. These could be initially on a quarterly basis. Recommendations from all concerned, especially from the participating countries and user groups, should be promptly executed by the Responsible Agent or Agency.

Exhibit I

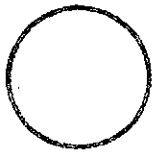
TECHNICAL INFORMATION CREATION, PUBLICATION, DISTRIBUTION AND USE-SUPPLY AND DEMAND



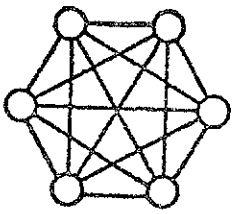


/Exhibit II

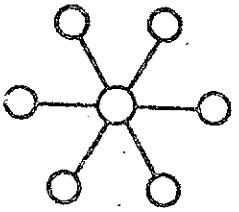
Exhibit II



a. Monolito

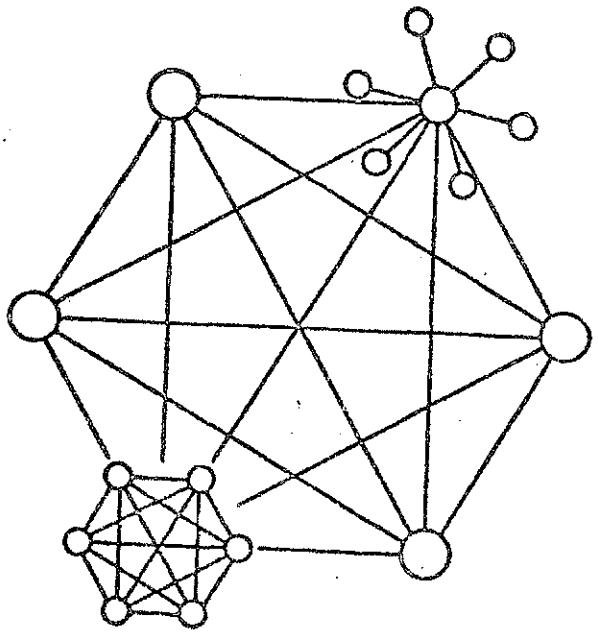


b. Libre no-organizada

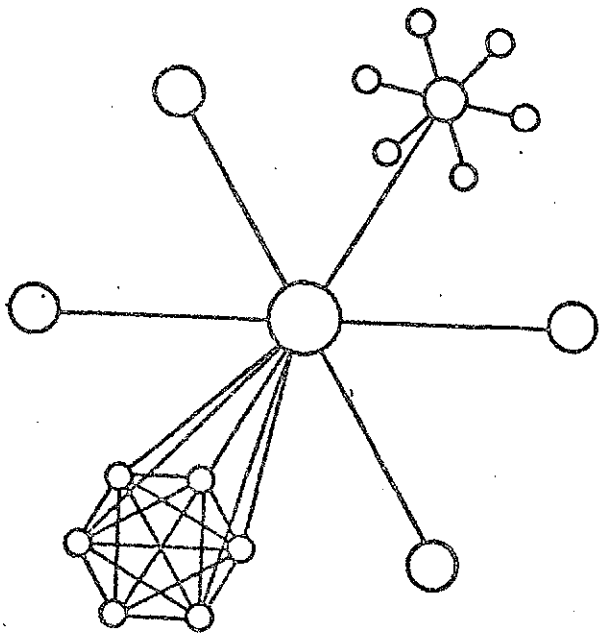


c. Coordinada

Redes Básicas



d. Libre no-organizada



e. Coordinada

Redes Aglomeradas

FIGURA 8. ORGANIZACION DE REDES

Fuente: OEA, Elementos Básicos de la Planificación y Concepción de los Sistemas de Información Regional, Mayo de 1971.

Annex A

PERSONS INTERVIEWED, JUNE 14-28, 1977, MEXICO, D.F.

INFOTEC-CONACYT Apartado Postal 19-194 México 19, D.F.	José Quevedo Procel Director Ejecutivo
	Joan Brodovsky Consejero Técnico
	Carlos Izaguirre Gerente de Información Interna
	Ricardo Martínez Montes de Oca Consejero Técnico
	Jorge Cepeda Coordinador del Servicio de Información Tecnológica
	Manuel Serdán Alvarez Consejero Técnico
	Alberto García Servicio de Información Interna
SECOBI-CONACYT Barranca del Muerto 310, Piso 3 México, D.F.	Carmen Castañedas Jefe del Departamento de Promoción y Servicios
CONACYT Insurgentes Sur 1814, Piso 9 México 20, D.F.	Guadalupe Carrión Coordinadora de la Dirección de Información y Documentación
Centro Nacional de Información y Documentación en Salud Secretaría de Salubridad y Asistencia Liverpool 54, Piso 3 México 6, D.F.	Francisco Bulnes Director Técnico, Investigación y Docencia
	Agustín Flandes C. Director Técnico de Información y Documentación
UNIDO Nacional Financiera, S.A. Reforma 136-7 México, D.F.	Edward Martindale

/Instituto

Instituto Nacional de Investigaciones Agrarias	Pablo Velásquez Library Director
Instituto de Investigaciones Eléctricas Apartado Postal 5-849 México 5, D.F.	Guillermo Fernández de la Garza Director Ejecutivo (Formerly Director at CONACYT)
Denver Research Institute University of Denver Denver, Colorado 80210 U.S.A.	Theodore W. Schlie Research Economist Office of International Programs
Centro de Información Científica UNAM México 20, D.F.	Armando Sandoval
International Development Research Centre Ottawa, Canada	John Woolston George Clement

/Annex B

Annex B

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D. Organizational Documents and Publications

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- Organization Chart

- 4 page description of services, resources and data bases.

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- Organization Chart

- Brochure on "Programa de Información Tecnológica"

- Noticias Técnicas. Monthly lists of technical reports of interest in the following industries or subjects: nutrition, contamination, electric industry, pharmaceutical industry, industrial engineering, metalmechanic, and chemistry.

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- Brochure describing SECOBI's organization, resources, services, available data banks, etc.

/Annex C

INFOTEC CONACYT

noticias técnicas industria alimentaria

San Lorenzo 153-11o. piso
México 12, D. F. Tel. 559-5211
Apartado postal 19-194

Fideicomiso en Nacional Financiero, S. A.

clave — Indique en el circulo los artículos de interes — idioma — págs.

)	L773207	Importancia de la toxicología en alimentos *Food Product Development Vol. 10, Núm. 8, Octubre 1976.*	Ing.	3
)	L773208	Procesamiento y control de calidad de productos del tomate: Pte. 2 de 3 *Indian Food Packer Vol. 30, Núm. 1, Febrero 1976.*	Ing.	13
)	L773209	Helados y postres congelados: Parte 3 de 5 *Industrias Lácteas Vol. 25, Núm. 6, Noviembre/Diciembre 1976.*	Esp.	6
)	L773210	Pastas alimenticias enriquecidas, elaboradas en varios países: Parte 2/3 *Tecnología Núm. 98, Diciembre 1975.*	Esp.	7
)	L773211	La industria alimentaria en México y las empresas extranjeras *Comercio Exterior Vol. 26, Núm. 12, Diciembre 1976.*	Esp.	15
	L773212	Normas de calidad de alimentos en México *Tecnología LANFI Vol. 2, Núm. 3, Julio/Septiembre 1976.*	Esp.	4
)	L773213	Limpieza y desinfección en la industria láctea *Vía Láctea Vol. 8, Núm. 29, Enero/Marzo 1976.*	Esp.	6
	L773214	Propiedades funcionales de las melazas *Baker's Digest Vol. 50, Núm. 5, Octubre 1976.*	Ing.	3
	L773215	Cambios físicos en carne de res empacada al vacío con varios materiales *J. of Mild and Food Tech. Vol. 39, Núm. 11, Noviembre 1976.*	Ing.	5
)	L773216	Evaluación de tortillas de maíz enriquecidas con harinolina de algodón *J. of Food Science Vol. 41, Núm. 6, Noviembre/Diciembre 1976.*	Ing.	4
)	L773217	Como ahorrar energía, usando intercambiadores de calor de placas *Food Engineering Vol. 1, Núm. 10, Octubre 1976.*	Ing.	3
)	L773218	La importancia de las enzimas en la industria alimentaria *Cereal Foods World Vol. 21, Núm. 11, Noviembre 1976.*	Ing.	3
)	L773219	Corrosión de la capa de estaño de las latas por mango y naranja *J. Food Sci. Tech. Vol. 13, Núm. 1, Enero/Febrero 1976.*	Ing.	7
	L773220	Monóxido de carbono como conservador en almacenamiento de carne fresca *Canadian I. of Food S. & T. Vol. 9, Núm. 3, Julio 1976.*	Ing.	4
	L773221	Empacado de alimentos que combina la esterilización a la flama y vacío *CSIRO Food Research Q. Vol. 36, Junio 1976.*	Ing.	4
	L773222	Empleo de las proteínas de soya en alimentos *Food Technology Vol. 30, Núm. 4, Abril 1976.*	Ing.	4
)	L773223	Determinación de los ácidos benzóico y sórbico en jugo de naranja *Analyst Vol. 101, Núm. 1198, Enero 1976.*	Ing.	6
)	L773224	Producción y preservación de los cultivos para yogurt *Dairy Industries Int. Vol. 41, Núm. 11, Noviembre 1976.*	Ing.	4

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" METODOS DE CONTROL "

- C773197 Combustión en lecho fluidizado reduce contaminación por hornos y calderas Esp.
  Spectrum, Núm. 142, 1976.
- C773198 Reglamentaciones de OSHA y su problemática sobre el control de ruido Ing.
  Ocupational Hazards, Julio 1976.
- C773199 Incineración de desechos acuosos con alto contenido de materia orgánica Ing.
  Int. Chem. Engineering Vol. 16, Núm. 4, Octubre 1976.
- C773200 Electrodialisis para eliminar sales en agua de torres de enfriamiento Ing.
  Combustion Vol. 48, Núm. 4, Octubre 1976.
- C773201 Daños ecológicos por la contaminación y utilización de contaminantes Esp.
  Folleto S/N, 1975.

" RECIRCULACION "

- C773202 Aprovechamiento de los desechos de la industria alimentaria: Parte 2/6 Ing.
  Advances in Food Research Vol. 17, 1969.
- C773203 Recuperación y recirculación de metales no ferrosos Ing.
  Eng. & Met. Eng., Julio 1975.
- C773204 Adelantos europeos en la recirculación de papeles de desecho Ing.
  Tappi Vol. 56, Núm. 10, Octubre 1973.
- C773205 Reutilización en continuo de agua por ósmosis inversa en fábricas de papel Ing.
  CEP Technical Manual Vol. 1, 1974.
- C773206 Obtención de dextrana a partir de mieles finales de caña y remolacha Esp.
  Bol. ICIDCA Vol. 3, Núm. 3, Marzo 1969.

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E773274	Diseño por computadora *Electronic Engineering Vol. 45, Núm. 547, Septiembre 1973.*	Ing.	4
E773275	Fusibles en el control de la presión en transformadores de pedestal *Electrical World, Vol. 185, Núm. 5, Marzo 1976.*	Ing.	4
E773276	Controles para motores de alto voltaje *Electrical Engineer Vol. 52, Núm. 8, Agosto 1975.*	Ing.	6
E773277	Pequeños motores C.D. con bobina en rotor sin núcleo de hierro *Philips Tech. Rev. Vol. 33, Núms. 8/9, 1973.*	Ing.	5
E773278	Energía I^2t en fusibles durante corto circuito y daño en el equipo: 1/3 *Electrical Const. & Maint Vol. 76, Núm. 1, Enero 1977.*	Ing.	4
E773279	Diseñando para mercados en el extranjero *Machine Design Vol. 46, Núm. 20, Agosto 1974.*	Ing.	6
E773280	¿Medidores digitales o de aguja? *Machine Design Vol. 46, Núm. 21, Septiembre 1974.*	Ing.	3
E773281	Ventajas de los relevadores transistorizados *Electrical Times, Junio 1976.*	Ing.	2
E773282	Resolviendo problemas eléctricos: parte 1/4 *Electrical Const. & Maint Vol. 75, Núm. 10, Octubre 1976.*	Ing.	9
E773283	Controles de frecuencia variable para velocidad de bombeo *Power Vol. 121, Núm. 1, Enero 1977.*	Ing.	5
E773284	Desarrollos en cables XLPE *Electrical Review Vol. 200, Núm. 1, Enero 1977.*	Ing.	3
E773285	Ultrasonido como herramienta de producción: parte 2 *Appliance Vol. 33, Núm. 11, Noviembre 1976.*	Ing.	7
E773286	Procedimientos para estimación de costos en instalaciones eléctricas:P.3 *Plant Engineering Library*	Ing.	9
E773287	Plan de requerimiento de material para manufactura de transformadores *Prodn. & Inventory Magt. 1976.*	Ing.	16
E773288	Indices de contenido de algunas revistas	Ing.	13
E773322	Preparación de elastómeros de uretano para usos eléctricos y electrónicos *Seminario Aislamientos Elec., Agosto 1970.*	Esp.	9

El artículo E773274 que aparece en este boletín lo forman las tablas de contenido de varias evistas. Por este medio usted podrá identificar otros artículos que no se han publicado en oticias Técnicas".

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clave — Indique en el circulo los articulos de interes — idioma p:

F773289 Avances en el empaque de medicamentos.-I.1/2: Uso de materiales plásticos Ing.
Drug Development Comms. Vol. 2, Núm. 2, 1976.

F773290 Equipo adecuado para la manufactura de parenterales de alta calidad: 3/3 Ing.
Drug Development Comms. Vol. 2, 1976.

F773291 Programación y análisis de las inversiones en la Industria Farmacéutica Ita.
Boll. Chimico Farm. Vol. 115, Núm. 4, Abril 1976.

F773292 Caracteristicas del licenciamiento de tecnologia farmacéutica Ing.
Les Nouvelles Vol. 11, Núm. 3, Septiembre 1976.

F773293 La solubilidad como indice de actividad de un principio activo Ing.
Can. J. Pharm. Sciences Vol. 11, Núm. 4, Octubre 1976.

F773294 Filtración de soluciones parenterales para evitar flebitis Ing.
Am. J. Hospital Pharmacy Vol. 33, Núm. 11, Noviembre 1976.

F773295 Titulación no acuosa de nafazolina y difenhidramina en colirios Ing.
Can. J. Pharm. Sciences Vol. 11, Núm. 2, Abril 1976.

F773296 Determinación de cafeina y codeina en medicamentos por cromatografia G-L Ing.
J. Pharm. Sciences Vol. 64, Núm. 10, Octubre 1975.

F773297 Evaluación y control de operaciones de maquiladores farmacéuticos Ing.
Drug and Cosmetic Ind. Vol. 119, Núm. 5, Noviembre 1976.

F773298 Caracteristicas de desintegración de 3 excipientes para tabletas Ing.
Drug Development Comm. Vol. 1, Núm. 4, 1974-1975.

F773299 Efecto del contenido de almidón aglutinante en la disolución de tabletas Ing.
Mfg. Chemist, Aer. News Vol. 47, Núm. 10, Octubre 1976.

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I773241	Estudio sobre la manufactura por grupos tecnológicos *Production Engineer Vol. 55, Núm. 9, Septiembre 1976.*	Ing.	4
I773242	Guía para mejorar los controles en producción y su bibliografía *Production and Inventory Vol. 14, Núm. 3, Julio-Septiembre 1973.*	Ing.	5
I773243	La planeación como un medio para lograr productividad *Industrial Engineering Vol. 8, Núm. 11, Noviembre 1976.*	Ing.	6
I773244	La asignación del trabajo y su relación con la salud mental *Alta Dirección Vol. 12, Núm. 65, Enero-Febrero 1976.*	Esp.	10
I773245	El departamento de ingeniería y su productividad: Parte 1 de 4 *Machine Design Vol. 47, Núm. 29, Diciembre 1975.*	Ing.	7
I773246	Consideraciones generales en la compra de equipo *Chemical Technology Vol. 6, Núm. 7, Julio 1976.*	Ing.	3
I773247	Como controlar su sistema de aire comprimido *Ingeniería de Fábricas Vol. 5, Núm. 5, Octubre 1976.*	Esp.	3
I773248	Los círculos de control de calidad y su importancia dentro de la empresa *Sistemas de Calidad Vol. 3, Núm. 18, Julio-Agosto 1976.*	Esp.	10
I773249	Como reducir su inventario sin perjudicar las entregas *Industrial Engineering Vol. 8, Núm. 11, Noviembre 1976.*	Ing.	5
I773250	Como proteger sus racks de los impactos con montacargas *Modern Materials Handling Vol. 31, Núm. 10, Octubre 1976.*	Ing.	3
I773251	Método para el balanceo de las cargas de trabajo en mantenimiento *Plant Engineering Vol. 30, Núm. 24, Noviembre 1976.*	Ing.	4
I773252	20 Prácticas de seguridad industrial en el manejo de materiales *Material Handling Engineering Vol. 28, Núm. 6, Junio 1973.*	Ing.	4
I773253	Sistemas industriales para detección de fuego *Electrical Time, Núm. 4389, Julio 1976.*	Ing.	4
I773254	Diseñe su empaque de acuerdo a su producto: Parte 2 de 3 *Modern Packaging Encyclop. Vol. 49, Núm. 12, Diciembre 1976.*	Ing.	13
I773255	Los efectos del adiestramiento en las relaciones humanas *Pedagogía para el Adiest. Vol. 5, Núm. 20, Julio/Septiembre 1975.*	Esp.	9
I773256	La disciplina llave para el éxito en la supervisión *Supervisor's Bulletin, Núm. 494, Mayo 1976.*	Ing.	3
I773257	El centro de cómputo como organización productiva *Administración de Empresas Vol. IV-B, Octubre-Marzo.*	Esp.	10

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M773258	Como seleccionar filtros hidráulicos para una mayor vida útil *Machine Design Vol. 48, Núm. 27, Noviembre 25 de 1976.*	Ing.
M773259	Limpieza de piezas metálicas por chorro de munición *IRON AGE Vol. 218, Núm. 7, Agosto 1976.*	Ing.
M773260	Ahorro de energía en el proceso de pintado *Manufacturing Engineering Vol. 77, Núm. 5, Noviembre 1976.*	Ing.
M773261	Uso de nuevos abrasivos en las operaciones de rectificado *Cutting Tool Engineering Vol. 28, Núm. 9-10, Octubre 1976.*	Ing.
M773262	Guía para seleccionar tornillos para ambientes corrosivos *IRON AGE Vol. 218, Núm. 2, Julio 1976.*	Ing.
M773263	Consideraciones prácticas sobre la fundición de hierro nodular *COLADA Vol. 9, Núm. 9, Septiembre 1976.*	Esp.
M773264	Como silenciar instalaciones hidráulicas *Machine Design Vol. 48, Núm. 24, Octubre 1976.*	Ing.
M773265	Ventajas y limitaciones de los lubricantes sólidos *Lubrication Engineering Vol. 32, Núm. 11, Noviembre 1976.*	Ing.
M773266	Propiedades, procesamiento y usos de la lámina de acero: Parte 2 de 2 *American Machinist Vol. 120, Núm. 5, Mayo 1976.*	Ing.
M773267	Ideas prácticas que aumentan la productividad de su taller #3 *American Machinist Vol. 120, Núm. 5-6, Mayo/Junio 1976.*	Ing.
M773268	Desarrollos recientes en el diseño de prensas mecánicas *Sheet Metal Industries Vol. 63, Núm. 9, Septiembre 1976.*	Ing.
M773269	Como seleccionar y probar máquinas herramientas: Parte 2 de 5 *1971, UNIDO.*	Ing.
M773270	Alineación radial de punzones de troquelado *Tooling Vol. 30, Núm. 2, Febrero 1976.*	Ing.
M773271	Recuperación de calor en hornos de calentamiento para forja *Met. & Metal Forming Vol. 43, Núm. 6, Junio 1976.*	Ing.
M773272	Control de calidad y uso de adhesivos "Hot melt"en fundición *Modern Casting Vol. 66, Núm. 10, Octubre 1976.*	Ing.
K773273	Diseño de moldes para plástico: Parte 7 y 8 de 14 *Tooling Vol. 29, Núm. 8-9, Agosto/Septiembre 1975.*	Ing.
K773317	Características normalizadas de los recipientes para manejo de cloro *Chemical Age of India Vol. 27, Núm. 5, Mayo 1976.*	Ing.

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○	Q773310	Aplicaciones industriales y características del cromo y sus derivados *Galvano-Organo Vol. 45, Núm. 463, Marzo 1976.*	Fra.	3
○	Q773311	El peróxido de hidrógeno y su aplicación en blanqueo de pulpa y papel *Tecnología LANFI Vol. 2, Núm. 4, Octubre-Diciembre 1976.*	Esp.	8
○	Q773312	Desarrollos recientes en el área de operaciones unitarias (1972-73) *Rep. Prog. Appl. Chem. Vol. 58, 1975.*	Ing.	10
○	Q773313	Consideraciones sobre la formulación y desarrollo de nuevos pesticidas *Afinidad Vol. 33, Núm. 1, Enero-Febrero 1976.*	Esp.	5
○	Q773314	Diseño de sistemas de agitación: Aplicación de agitadores de turbina *Chemical Engineering Vol. 83, Núm. 24, Noviembre 1976.*	Ing.	7
	Q773315	Evaluación de pigmentos de uso en pinturas solubles en agua *Ind. Finishing & Surf. Coat. Vol. 28, Núm. 338, Agosto/Sept. 1976.*	Ing.	6
	Q773316	Diagramas de flujo sobre procesamiento y beneficio de minerales: Cobre *Eng. & Min. J. Vol. 176, Núm. 6, Junio 1975.*	Ing.	7
	K773317	Características normalizadas de los recipientes para manejo de cloro *Chemical Age of India Vol. 27, Núm. 5, Mayo 1976.*	Ing.	3
	Q773318	Producción de carbón activado a partir de cáscara dura de coco *Indian J. Technology Vol. 14, Núm. 1, Enero 1976.*	Ing.	5
○	Q773319	Reseña de libros útiles para su empresa *ION Rev. Española Quim. Apl., 1976.*	Esp.	4
	Q773320	Comparación de propiedades lubricantes: Aceites de ricino vs sintéticos *Tropical Science Vol. 17, Núm. 4, 1975.*	Ing.	12
		" P O L I M E R O S "		
	K773273	Diseño de moldes para plástico: Partes 7 y 8 de 14 *Tooling Vol. 29, Núm. 8/9, Agosto/Septiembre 1975.*	Ing.	15
	Q773321	La industria de elastómeros en América Latina: Situación y Perspectivas: 1/2 *Noticiero del Plástico, Noviembre 1976.*	Esp.	5
	K773322	Preparación de elastómeros de uretano para usos eléctricos y electrónicos *Seminario Aislamientos Elec., Agosto 1970.*	Esp.	9
○	Q773323	Hules de silicón: Propiedades, características y aplicaciones *Eng. Materials and Design Vol. 20, Núm. 8, Agosto 1976.*	Ing.	3
	Q773324	Técnicas para producir perfiles estandar de plásticos reforzados: Pte. 1/2 *Plastics & Composites, Núm. 304, Septiembre 1976.*	Ing.	9
○	Q773325	Instalaciones y métodos de inyección para espuma rígida de PVC *Plásticos Universales Vol. 20, Núm. 2, Marzo/Abril 1976.*	Esp.	8

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PROYECTOS ESPECIALES CUENTA MAR DEL PLATA

PROGRAMA REGIONAL DE DESARROLLO CIENTIFICO Y TECNOLOGICO

Programación 1974/75
1975/76
1976/77

Washington, D. C., Marzo 1977

PE 14. Información y Asistencia Técnica a la Industria

A. Resumen General

1. Objetivos generales

Aplicación del conocimiento tecnológico existente al proceso productivo. Para lograr el mayor efecto se organiza el proceso de difusión de información técnica de tal forma que se garantiza que la misma está llegando al industrial. Asimismo, es necesario organizar el almacenamiento de la información, su recuperación y difusión para lo cual se establecen convenios de intercambio, se publican listas especializadas y se utilizan sistemas automatizados.

2. Instituciones participantes

		Montos 74/75	75/76	76/77
Bolivia	Dirección General de Normas y Tecnología, DGNT.	55.000	11.200	31.700
Colombia	Fondo Colombiano de Investigaciones Científicas y Proyectos Especiales "Francisco José de Caldas", COLCIENCIAS	28.000	59.400	97.500
	Instituto de Investigaciones Tecnológicas, IIT	52.900	63.300	
Costa Rica	Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT	-	30.000	10.000
Chile	Consejo Nacional de Investigaciones Científicas y Tecnológicas, CONICIT	52.000	30.000	10.000
	Instituto de Investigaciones Tecnológicas INTEC/CORFO	48.000	30.000	10.000
Ecuador	Junta Nacional de Planificación y Coordinación, JUNAPLAN	-	20.100	4.000
	Escuela Politécnica Nacional, EPN	10.000	18.000	14.000

/Centro de

		74/75	75/76	76/77
	Centro de Desarrollo Industrial del Ecuador, CENDES	10.000	31.000	15.260
Honduras	Banco Central de Honduras, Departamento de Investigaciones Industriales	-	29.900	37.900
Guatemala	Instituto Técnico de Capacitación y Productividad, INTECAP	-	15.000	65.000
México	Información para la Industria, INFOTEC/CONACYT	100.000	120.000	63.000
Nicaragua	Banco Central de Nicaragua	-	18.200	42.000
Perú	Consejo Nacional de Investigación, CONI	32.000	21.000	-
	Industria del Perú, INDUPERU	24.500	16.000	-
	Electricidad del Perú, ELECTROPERU	20.000	16.000	-
	Petróleos del Perú, PETROPERU	20.000	16.000	-
	PESCA PERU	-	6.000	-
	MINEROPERU	-	6.000	-
República Dominicana	Instituto Dominicano de Tecnología Industrial, INDOTEC	-	41.000	35.200
Venezuela	Centro Nacional de Información Científica y Tecnológica, CONICIT	360.000	262.900	70.000

B. Resumen por centro

1. Centro: Dirección General de Normas y Tecnología

País: Bolivia

/Fecha de

Fecha de iniciación de operación: Abril 1975

Duración: Cuatro años

Metas a cumplir en el período 75/76: Determinación de la oferta y demanda de información, haciendo una relación cuantitativa y geográfica de usuarios y operantes. Implementación de sistemas operativos automáticos para el almacenamiento y recuperación de la información técnica y científica. Contratación de un experto para reforzar los conocimientos en la organización de servicios de información técnica. Inicio del servicio de asistencia técnica (ingeniería industrial) a las empresas en sus diferentes rubros. Mejorar los sistemas de clasificación y catalogación del acervo bibliográfico existente en el servicio, así como la evaluación de necesidades futuras de quipo y material documentario.

Actividades a realizar en el período 75/76: Contratación de un ingeniero. 12 meses (local). Adquisición de fotocopiadora, microfilmadora, repuestos, accesorios y materiales varios, y bibliografía. Publicación de boletines mensuales de noticias técnicas y un catálogo de publicaciones periódicas. Realización de un ciclo de conferencias locales bajo el auspicio de la DGNT para hacer conocer los alcances y propósitos del SITI y su importancia como instrumento básico para el desarrollo industrial del país.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	4.600	4.200	
Becas	5.500	---	
Equipos, suministros y bibliografía	39.600	3.300	
Viajes	2.500	1.000	
Documentos	2.500	2.200	
Otros gastos		500	
	55.000	11.200	

2. Centro: COLCIENCIAS

País: Colombia

Fecha de iniciación de operación: Febrero, 1975

Duración: Seis años

/Metas a

Metas a cumplir en el período 75/76: Capacitación a nivel nacional de técnicos en información industrial. Fortalecimiento de las colecciones bibliográficas básicas de los servicios especializados. Estudios de factibilidad de organización de servicios especializados de información industrial en nuevas áreas.

Actividades a realizar en el período 75/76: Dos cursos nacionales de información industrial. Adquisición de material bibliográfico y equipo para los servicios especializados. Adiestramiento de seis técnicos en centros del extranjero. Publicación de un boletín de noticias técnicas.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	-	6.000	
Becas			
Equipos y suministros	13.000	32.400	
Viajes	10.000	14.000	
Documentos	1.000	5.000	
Otros costos	4.000	2.000	
	28.000	59.400	97.500

3. Centro: Instituto de Investigaciones Tecnológicas

País: Colombia

Fecha de iniciación de operación: Febrero, 1975

Duración: Seis años

Metas a cumplir en el período 75/76: Desarrollo del servicio nacional de información en tecnología de alimentos. Establecimiento de acuerdos de cooperación a nivel regional en este campo.

Actividades a realizar en el período 75/76: Publicación de un boletín de noticias técnicas. Publicación de un catálogo de los recursos existentes de información en tecnología de alimentos. Entrenamiento de dos técnicos en cursos y seminarios de corta duración. Programa de enlace industrial.

/Distribución

Distribución del presupuesto	74/75	75/76	76/77
Contratos	16.000	35.000	
Becas	-	-	
Equipos y suministros	22.900	13.300	
Viajes	5.000	6.000	
Documentos	7.000	6.000	
Otros costos	2.000	3.000	
	52.900	63.300	10.000

4. Centro: Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICIT)

País: Costa Rica

Fecha de iniciación de operación: Mayo, 1976

Duración: Cuatro años

Metas a cumplir en el período 75/76: Fortalecimiento de la infraestructura nacional de información. Estudio de los mecanimos de transferencia de información que permitan el acceso oportuno a nuevos conocimientos científicos y tecnológicos y a su utilización más efectiva en la industria. Colaboración e intercambio de información con servicios dentro y fuera de la subregión. Desarrollar un sistema de información para la industria de alimentos que estará a cargo del Instituto Tecnológico de Costa Rica.

Actividades a realizar en el período 75/76: Elaboración del catálogo colectivo de publicaciones periódicas en el país. Asistencia a los seminarios de información programadas para la subregión. Visita a centros de información dentro y fuera de la subregión. Adquisición de equipo y bibliografía.

Distribución del presupuesto:	75/76	76/77
Viajes	7.000	
Contratos	5.500	
Becas	2.500	
Equipos y suministros	15.000	
Otros costos	-	
	30.000	10.000

/5. Centro:

5. Centro: Comisión Nacional de Investigación Cientifica y Tecnológica (CONICYT)

País: Chile

Fecha de iniciación de operación: Noviembre, 1974

Duración: Cuatros años

Metas a cumplir en el período 75/76: Publicación y distribución de una guía nacional de servicios científicos y tecnológicos y de una guía nacional de equipos e instrumentos científicos y tecnológicos. Incrementar los servicios a través de unidades especializadas en recursos del mar, recursos mineros, recursos energéticos. Colaborar con los otros centros de la región a través de la unidad de información sobre cooperación técnica internacional.

Actividades a realizar en el período 75/76: Para la obtención, procesamiento y publicación de las guías: contratación de un programador por 12 meses, media jornada. Contratación de dos tecnicos por 6 meses, jornada completa, para la obtención y codificación de la información. Servicios de computación e impresión. Para el fortalecimiento de los servicios de información: contratación de un especialista en documentación por 12 meses para las unidades de información en cooperación técnica internacional. Adquisición de bibliografía en recursos del mar, mineros y energéticos. Contratación de un programador por 12 meses, media jornada. Servicios de computación e impresión.

Distribución del presupuesto	74/75	75/76	76/77
Viajes	7.000	-	
Contratos	13.500	7.800	
Becas	-	-	
Equipos y suministros	14.500	10.000	
Documentos	8.000	7.200	
Otros costos	9.000	5.000	
	52.000	30.000	10.000

6. Centro: Instituto de Investigación Tecnológicas /CORFO (INTEC/CORFO)

País: Chile

Fecha de iniciación de operación: Noviembre, 1974

/Duración:

Duración: Cuatro años

Metas a cumplir en el período 75/76: Organización de un centro de información en el Colegio de Ingenieros. Publicación y distrubición de un directorio de representantes de empresas extranjeras. Asesoría de técnicos nacionales para la selección final de la información recopilada en el levantamiento de tecnología internacional y su publicación

Actividades a realizar en el período 75/76: Para la organización del centro de información en el Colegio de Ingenieros. Entrenamiento de un técnico del Colegio de Ingenieros por 4 semanas. Contratación de personal local y material de consumo para el archivo de contactos, 8 semanas. Para la publicación del directorio de empresas extranjeras: Contratación de personal local y material de consumo para la recopilación de la información. Efectuar entrevistas personales y la preparación del directorio, 16 semanas. Para la asesoría de técnicos nacionales para la selección final de la información recopilada en el levantamiento de tecnología internacional. Contratación de personal local para determinar las fuentes nacionales de asesoría para cada sector (búsqueda de expertos), 2 semanas. Pago de honorarios por asesoría de expertos nacionales para calificar la información detectada, 14 semanas. Impresión y publicación de la información en portafolio por sector industrial. Adquisición de fuentes de información escrita.

Distribución del presupuesto:	74/75	75/76	76/77
Viajes	5.500	1.800	
Contratos	6.000	7.300	
Becas	-	-	
Equipos y suministros	16.000	8.400	
Documentos	8.500	12.500	
Otros costos	12.000	-	
	48.000	30.000	10.000

7. Centro: Junta de Planificación Económica

País: Ecuador

Fecha de iniciación de operación:

Duración: Cuatro años

Metas a cumplir en el período 75/76: Diseño del Sistema Nacional de Información Científica y Técnica.

/Actividades

Actividades a realizar en el período 75/76: Preparación de un estudio de base para el sistema nacional de información. Participación en reuniones técnicas sobre planificación y política de información.

Distribución del presupuesto:	75/76	76/77
Contratos	10.600	
Becas	-	
Equipos y suministros	4.000	
Viajes	3.500	3.000
Documentos	1.000	-
Otros costos	1.000	1.000
	20.100	4.000

8. Centro: Instituto de Investigación Tecnológica - Escuela Politécnica Nacional

País: Ecuador

Fecha de iniciación de operación: Junio, 1975

Duración: Seis años

Metas a cumplir en el período 75/76: Hacer el servicio extensivo a todo el territorio nacional en ela rama de ingeniería eléctrica y mecánica, sirviendo a investigadores e industriales.

Actividades a realizar en el período 75/76: Publicación de un boletín de noticias técnicas y difusión amplia en todo el país. Participación en reuniones de carácter técnico.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos			2.000
Becas			3.000
Equipos y suministros	9.000	16.000	6.000
Viajes	-	1.000	1.000
Documentos	-	1.000	1.000
Otros costos	1.000	-	1.000
	10.000	18.000	14.000

9. Centro: Centro de Desarrollo Industrial del Ecuador

País: Ecuador

/Fecha de

Fecha de iniciación de operación: Junio, 1976

Duración: Seis años

Metas a cumplir en el período 75/76: Ampliar el servicio selectivo de diseminación de información técnica para servir a 1200 clientes mensualmente y cubrir nuevas áreas. Aumentar su servicio de preguntas-respuestas hasta alcanzar un promedio de 50 preguntas mensuales. Capacitar al personal para el mejoramiento en el tratamiento y análisis de la información.

Actividades a realizar en el período 75/76: Participación 4 técnicos en cursos y seminarios de corta duración. Publicación de noticias técnicas mensualmente. Reorganización del servicio de pregunta-respuesta.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	-	-	
Becas	-	-	3.400
Equipos y suministros	9.000	18.000	8.860
Viajes	-	6.000	2.000
Documentos	-	1.000	-
Otros costos	1.000	6.000	1.000
	10.000	31.000	15.260

10. Centro: Banco Central de Honduras - Departamento de Investigaciones Industriales

País: Honduras

Fecha de iniciación de operación: Septiembre, 1976

Duración: Cuatro años

Metas a cumplir en el período 75/76: Difundir el conocimiento técnico de interés a la industria para su aplicación adecuada, de acuerdo a las necesidades y características del país. Apoyar al departamento de investigaciones industriales en sus operaciones. Colaboración e intercambio de información a nivel nacional, subregional y mundial.

Actividades a realizar en el período 75/76: Entrenamiento de los técnicos del centro de información en el Cendes de Ecuador e INTEC de Chile. Contratación de 1 ingeniero químico, 1 ingeniero industrial y 1 químico documentalista. Adquisición de equipo y bibliografía. Realización del estudio de selección de áreas industriales prioritarias para iniciar los servicios de información.

Distribución del presupuesto:	75/76
Viajes	4.700
Contratos	12.700
Becas	-
Equipos y suministros	8.500
Otros costos	4.000
	29.900

11. Centro: Instituto Técnico de Capacitación y Productividad (INTECAP)

País: Guatemala

Fecha de initiación de operación:

Duración: Cuatro años

Metas a cumplir en el período 75/76: Ampliar la capacidad de servicio del INTECAP. Desarrollo del centro de información de alimentos. Mejorar la infraestructura de la institución (equipo, bibliografía y documentos técnicos). Colaboración e intercambio de información con centros de Centroamérica y Caribe.

Actividades a realizar en el período 75/76: Asistencia a los seminarios de información organizados para la subregión. Adquisición de equipo y bibliografía. Visita a centros dentro y fuera de la subregión. Contratación de 1 experto internacional por 1 mes.

Distribución del presupuesto:	75/76	76/77
Viajes	5.950	13.225
Contratos	3.600	8.350
Becas	-	-
Equipos y suministros	4.200	41.625
Otros costos	1.250	1.800
	15.000	65.000

12. Centro: Información para la Industria INFOTEC/CONACYT

País: México

Fecha de iniciación de operación: Abril, 1975

Duración: Seis años

/Metas a

Metas a cumplir en el período 75/76: Ampliar la capacidad de servicio del INFOTEC/CONACYT. Desarrollar el Centro de Información Metalúrgica. Iniciar un servicio de recuperación de información-automatizado. Iniciar el servicio de localización de documentos a través de la red núcleo. Adiestramiento de personal. Desarrollo del Centro de Información Química. Desarrollo del Centro de Información del sector eléctrico.

Actividades a realizar en el período 75/76: Entrenamiento de 6 técnicos en cursos, seminarios y visitas a centros de información por un período de 15 días c/u. Contratación de 3 asesores internacionales por un total de 4 meses/hombre para un programa de maestría en información y para diseño y organización de servicios especialización. Se hará un curso sobre operación y administración de los servicios de información y asistencia técnica.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	14.800	16.500	
Becas	-	-	
Equipos y suministros	58.100	70.500	
Viajes	12.400	14.300	
Documentos	-	-	
Otros costos	14.700	18.700	
	100.000	120.000	63.000

13. Centro: Banco Central de Nicaragua - Centro Nicaraguense de Información Tecnológica (CENIT)

País: Nicaragua

Fecha de iniciación de operación: Mayo, 1976

Duración: Cuatro años

Metas a cumplir en el período 75/76: Determinar las necesidades del sector industrial en materia de información científico-tecnológica. Ampliar la capacidad de servicio y asistencia del Departamento de Investigaciones Tecnológicas del Banco Central de Nicaragua. Coordinación e intercambio de información con centros de Centroamérica y Caribe.

Actividades a realizar en el período 75/76: Asistencia a los seminarios de información organizados para la subregión. Realizar un estudio de necesidades de información del sector industrial. Adquisición de equipo y bibliografía. Visita a centros de información dentro y fuera de la subregión.

Distribución del presupuesto	75/76	76/77
Viajes	4.000	
Contratos	11.200	
Becas	-	
Equipos y suministros	-	
Otros costos	3.000	
	18.200	42.000

14. Centro: Consejo Nacional de Investigación

País: Perú

Fecha de iniciación de operación: Marzo, 1976

Duración: Seis años

Metas a cumplir en el periodo 75/76: Poner en funcionamiento centros de información en empresas estatales representativas de los sectores económicos. Entrenamiento de personal técnico. Mayor participación y colaboración con entidades extranjeras del área de información. Coordinación a nivel nacional para planificar el desarrollo del sector.

Actividades a realizar en el período 75/76: Entrenamiento de 2 técnicos por períodos de 1 mes c/u. Realización de un seminario a nivel regional sobre información y un curso nacional. Publicación mensual de un boletín de noticias técnicas.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	6.000	4.000	4.000
Becas	-	-	-
Equipos y suministros	5.500	6.000	6.000
Viajes	8.000	2.000	2.000
Documentos	5.500	3.000	3.000
Otros costos	7.000	6.000	6.000
	32.000	21.000	21.000

15. Centro: Industrias del Perú

País: Perú

Fecha de iniciación de operación: Marzo, 1976

Duración: Seis años

/Metas a

Metas a cumplir en el período 75/76: Prestar servicio de información en el área de industria básica como integrante del sistema nacional. Adiestramiento de personal técnico. Lograr una mayor utilización de los recursos de información de la empresa.

Actividades a realizar en el período 75/76: Entrenamiento de 3 técnicos en cursos y seminarios de corta duración. Publicación de un boletín de noticias técnicas. Iniciar servicio de pregunta-respuesta.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos			
Becas	6.500		
Equipos y suministros	13.500	13.800	13.800
Viajes	4.500	2.200	2.200
Documentos	-	-	-
Otros costos	-	-	-
	24.500	16.000	16.000

16. Centro: Electricidad del Perú

País: Perú

Fecha de iniciación de operación: Marzo, 1975

Duración: 6 años

Metas a cumplir en el período 75/76: Prestar servicio de información en el área de electricidad como integrante del sistema nacional. Adiestramiento de personal técnico. Lograr una mayor utilización de los recursos de información de la empresa.

Actividades a realizar en el período 75/76: Organización del servicio y entrenamiento de 4 técnicos por períodos de 1 mes c/u. en servicios similares. Publicación de un boletín de noticias técnicas. Iniciar programa de almacenaje y recuperación de información con métodos modernos.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	-	3.500	3.500
Becas	6.500		
Equipos y suministros	8.000	8.000	8.000
Viajes	4.000	2.500	2.500
Documentos	1.500	2.000	2.000
Otros costos	-	-	-
	20.000	16.000	16.000

17. Centro: Petróleos del Perú

País: Perú

Fecha de iniciación de operación: Marzo, 1975

Duración: Seis años

Metas a cumplir en el período 75/76: Prestar servicio de información en el área de petróleo y derivados como integrante del sistema nacional. Adiestramiento de personal técnico. Lograr una mayor utilización de los recursos de información de la empresa.

Actividades a realizar en el período 75/76: Puesta en marcha del sistema computarizado de almacenamiento y recuperación de información. Publicación de un boletín de noticias técnicas.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	-	-	-
Becas	6.500	-	-
Equipos y suministros	8.000	14.000	14.000
Viajes	4.000	2.000	2.000
Documentos	1.500	-	-
Otros costos	-	-	-
	20.000	16.000	16.000

18. Centro: Pesca Perú

País: Perú

Fecha de iniciación de operación: Septiembre 1976

Duración: Cuatro años

Metas a cumplir en el período 75/76: Prestar servicio de información en el área de pesquería sobre harina de pescado y consumo humano. Adiestramiento de personal técnico. Lograr una mayor utilización de los recursos de información de la empresa.

Actividades a realizar en el período 75/76: Adiestramiento de 2 técnicos en cursos y seminarios de corta duración. Adquisición de bibliografía básica para el servicio de pregunta-respuesta.

Distribución del presupuesto:	75/76	76/77
Contratos		
Becas		
Equipos y suministros	3.000	3.000
Viajes	3.000	3.000
Documentos	-	-
Otros costos	-	-
	6.000	6.000

19. Centro: Minero - Perú

País: Perú

Fecha de iniciación de operación:

Duración: Cuatro años

Metas a cumplir en el período 75/76: Prestar servicio de información en el campo minero-metalúrgico como integrante del sistema nacional. Adiestramiento de personal técnico. Lograr una mayor utilización de los recursos de información de la empresa.

Actividades a realizar en el período 75/76: Adiestramiento de 3 técnicos en servicios de información desarrollados, por períodos de 1 mes. Adquisición de bibliografía básica para los servicios que presta el Centro.

Distribución del presupuesto:	75/76	76/77
Contratos	-	-
Becas	-	-
Equipos y suministros	2.000	2.000
Viajes	4.000	4.000
Otros costos	-	-
	6.000	6.000

20. Centro: Instituto Dominicano de Tecnología Industrial

País: República Dominicana

Fecha de iniciación de operación: Julio, 1976

Duración: Cuatro años

/Metas a

Metas a cumplir en el período 75/76: Instalar y operar un plan piloto de servicios de información y asistencia técnica a la industria en el área de alimentos. Ampliar los servicios del INDOTEC a la industria. Colaboración e intercambio de información con centros de Centroamérica y Caribe. Reforzar la infraestructura bibliográfica del INDOTEC.

Actividades a realizar en el período 75/76: Entrenamiento de 1 profesional dominicano en servicios de información a la industria especialmente en el área de alimentos. Adquisición de equipo y bibliografía. Participación en las actividades subregionales según se describen en el documento regional. Visita a centros de información dentro y fuera de la subregión.

Distribución del presupuesto:	75/76	76/77
Viajes	8.200	
Contratos	9.000	
Becas	-	
Equipos y suministros	12.800	
Otros costos	11.000	
	41.000	-

21. Centro: Consejo Nacional de Investigación Científica, Tecnológica

País: Venezuela

Fecha de iniciación de operación: Julio, 1975

Duración: Seis años

Metas a cumplir en el período 75/76: Implementación y desarrollo de los sub-sistemas regionales de información. Consolidación del piloto de enlace industrial. Implementación de un servicio para las entidades encargadas del control de la tecnología extranjera. Aumento de los recursos humanos para el trabajo de los servicios de información.

Actividades a realizar en el período 75/76: Becar a 20 profesionales por períodos de 6 meses c/u. Adquisición de información especializada y difusión de la misma. Publicación de un portafolio de tecnologías nacionales. Puesta en marcha de un centro de información en metalurgia, tecnología de alimentos y química.

Distribución del presupuesto:	74/75	75/76	76/77
Contratos	27.000	54.000	15.000
Becas	66.000	35.000	5.000
Equipos y suministros	174.000	76.600	14.500
Viajes	22.000	51.300	10.000
Documentación	20.000	46.000	13.250
Otros costos	51.000	-	12.250
	360.000	262.900	70.000