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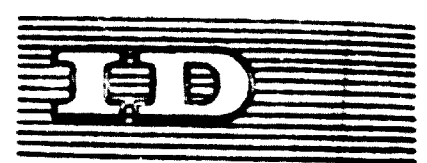
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CHILE ^{1/}

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I. INDUSTRIAL INFORMATION:
IMPORTANCE AND REQUIREMENTS
FROM THE POINT OF VIEW OF PLANNING

Report prepared by
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SUMMARY

This report presents a fresh point of view concerning industrial information, relating it to the needs and problems which the planner encounters in drawing up his plans and programmes and fixing strategies and goals on the basis of the background information normally available. The two-way relationship between industrial undertakings and planning organizations is also mentioned.

An analysis of the importance in industrial planning of industrial information as an implementation tool is then made, followed by a review of the sources of industrial information utilized by planning agencies in Chile.

Lastly, some of the information requirements in Chile are listed, and stress is laid on the importance of industrial information as a tool which makes possible the effective promotion of industrial development, and the need for organisations such as UNIDO to regard it in future as a matter for consideration in addition to the technological aspect, which is almost exclusively focused on service to industry.

1. General observations

This paper endeavours to present a fresh point of view concerning industrial information, relating it to the needs and problems which the planner encounters in drawing up his plans and programmes and fixing strategies and goals on the basis of the background information normally available.

Planning can be looked upon as a system through which an effort is made to meet the requirements of a development process in the most efficient way, from both the technical/economic and the social point of view, taking into account the economic/financial and the human and natural resources available.

Consequently, three levels are distinguished within a planning system:

Over-all or national planning;

Regional planning;

Sectoral planning.

It is in the latter field that the industrial information gathered in industrial enterprises should be primarily taken into account so as to provide a point of departure for planning and, subsequently, for carrying out adequate process evaluation and control, while at the same time there must be an outward movement of information to the industrial enterprise as a productive unit, concerning the most appropriate ways of expanding its field of action by developing new lines of production and increasing its production capacity through new investments or better utilization of existing plant, etc. In short, it should provide a point of departure for the formulation of specific policies for individual lines of production, making possible harmonious development.

Everything related to the development process which has implications for industry will naturally have to be planned also, e.g. the assignment of the financial resources required by an information centre for its proper operation, where such a centre already exists, and, if this is not the case, those required for its establishment.

Having stated the situation in these terms, and just to stress the importance of the matter, some aspects which it is thought UNIDO could usefully analyse and consider in future for discussion are presented below.

2. Importance of industrial information as a planning tool

Only to the extent that there is an adequate flow of fresh and reliable information from industry to the organizations responsible for industrial planning will it be possible to assess the basic situation and ensure good planning, i.e. the fixing of goals, plans and programmes, making possible planning on the basis of an accurate knowledge of the sector. The above involves an effort by industrialists, who will have to devote part of their time to the preparation and submission of the information requested of them; this effort will be recompensed by a reverse flow which will enable them not only to know what system is being applied to them with regard to policies and strategies, but also what are the guidelines governing development and orienting industrial activity, with regard to both technical and economic requirements.

On the basis of the above explanations, we can affirm the importance for industrial planners of the existence of this industrial information which will ultimately be transformed into a two-way flow as it is processed, studied, converted into plans and programmes and finally disseminated as information for industrial enterprises, in the sense already described.

Another closely related point is the fact that only the efficient provision of information will make possible good evaluation and control, enabling timely and appropriate measures to be taken to correct distortions in plans; such distortions may be due to many factors which this is not the place to analyse.

Project evaluation is another field in which adequate information systems are necessary. In this connexion, it must be pointed out that the planner will be rather dependent on the information which is available to him in order to be able to make a judgement concerning the feasibility of a project, and will have to exhaust all possibilities for comparing the technology used in the project with other existing technologies in order to assign the available resources in the most productive way possible; this procedure will enable him to assign priorities when he is confronted by projects of different types and to orient human and financial resources in such a way as to achieve maximum development, taking into account existing resources and limitations and possible alternative uses of resources.

Lastly, it is worth calling attention to the importance of industrial information which makes it possible to measure the secondary effects, from the productive and/or social point of view, that the adoption of new techniques and processes, the development of new products, etc., may have on other sectors.

3. Sources of industrial information used in industrial planning in Chile

Since manufacturing industry embraces a wide range of activities, a distinction must be made between those sources which provide processed information of a general nature and those which provide information of a specific nature. The former provide information concerning the whole manufacturing sector, whether with reference to the sector considered as a whole (over-all data), or to all the various parts of the whole (data broken down by activity). The information of a specific nature relates to a given activity or enterprise.

The main producers of periodic general information are the National Institute of Statistics and the Census (INEC) and the Manufacturing Development Corporation (SOFOFA); these organizations gather, process and publish such information.

INEC carries out an annual and a monthly survey for the purpose of preparing an index of physical production in the sector.

SOFOFA, through its Studies Department, carries out a monthly survey, using the resulting data to prepare an index of physical production, an index of real sales and an employment index. It also prepares a monthly index of electric power consumption on the basis of the data supplied by the three largest electricity distributing enterprises.

In addition, the Industrial Register Office (Oficina del Roll Industrial) of the Ministry of Economic Affairs, Development and Reconstruction annually compiles information which is required by law to be submitted by industrialists, but this information is neither processed nor published.

Information in the nature of specific periodic statistics is produced by various organizations where work is directly related to the individual branches. Some of the most important of these are the departments of the Production Development Corporation (CORFO), the Technical Co-operation Service (SCT), which is oriented towards small-scale industry, sectoral committees, associations of industrialists, etc.

Lastly, mention should be made of the responsibility which devolves upon INEC in carrying out and publishing a national manufacturing census, which is preceded by one year by a preliminary census. These are normally carried out every ten years.

4. Industrial information requirements for industrial planning: the case of Chile

Industrial development is being planned in Chile through a Six-Year Development Plan which embraces the over-all policies and goals for the six-year period from 1971 to 1976.

This Plan is to be executed by means of annual operative plans which will make it possible to proceed with execution of the plan in accordance with the results which are being achieved over the period. It is here, then, that it becomes absolutely necessary to have adequate information to take correct steps enabling the planners to impose or recommend measures to be adopted by industrialists in both the economic and technological spheres so that the proposed objectives can be achieved.

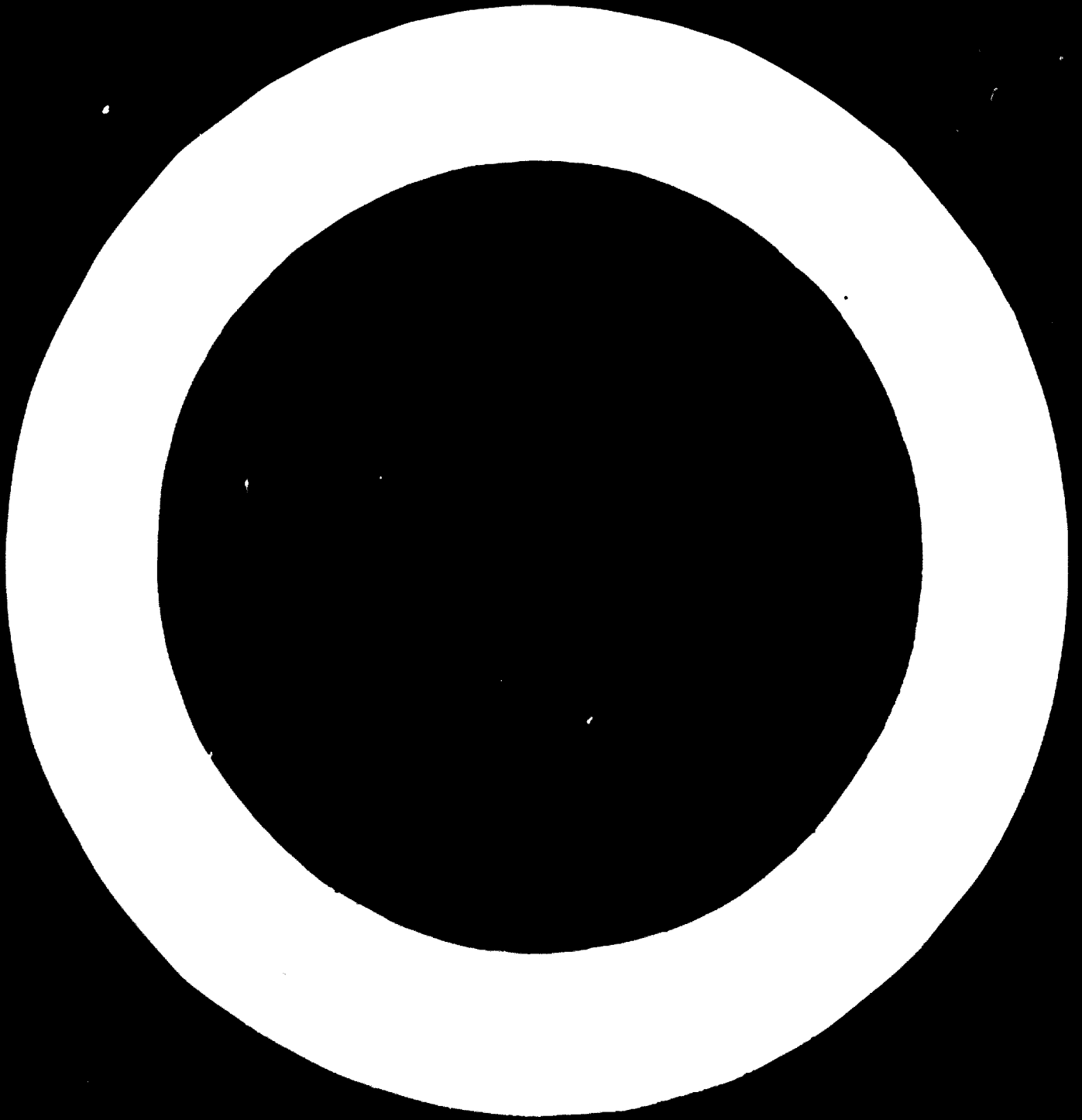
In a very general way, it is possible to specify some of the data which must be known for the above-mentioned purposes, and which will make it possible to measure the development process to some degree. These are:

- Gross national product
- Indices of production (value and physical production)
 - Sales
 - Consumption of power and fuel
 - Supply and demand
 - Employment
- Market information
- New investments in:
 - Research
 - Machinery and equipment
 - Buildings
 - Infrastructure
- Supply of raw materials
- Marketing channels
- Productivity
- Levels of remuneration

and several others which may be specific to individual activities and enterprises.

The gathering of information for the calculation of the indices and on the other aspects listed undoubtedly raises a number of problems, in particular that of obtaining the information with due promptness, broken down to the desired degree and in the same form as that in which it will be required on other occasions or in other places.

In conclusion, it is felt desirable to stress the importance of industrial information, since it is a tool making possible the effective promotion of industrial development, and also the need for organizations such as UNIDO to concern themselves with it, in addition to the technological aspect, which is primarily and almost exclusively oriented towards service to industry.



II. THE INDUSTRIAL INFORMATION SERVICES PROVIDED
BY THE CHILEAN INSTITUTE OF TECHNOLOGY;
EXPANSION AND NATIONAL CO-ORDINATION THROUGH
THE SUB-SYSTEM FOR INFORMATION ON INDUSTRIAL TECHNOLOGY

Report prepared by
María Angélica Moreno

SUMMARY

The experience gained at the Chilean Institute of Technology (INTEC) since its establishment is described, with particular stress on the role of a new concept of "industrial research" based on the establishment of effective contact with industrial undertakings themselves, with research workers acting simultaneously as information officers.

The report also explains the reasons for the establishment of the Institute in Chile and concludes that the results it has thus far obtained are satisfactory, despite the limited nature of the fields with which it is concerned.

Background is given on the organization of the INTEC Information Centre, and the main sources of information are described, distinguishing, in particular, two types, namely "traditional" and "non-traditional".

Lastly, various possibilities for the establishment of a national network for information on industrial technology are mentioned, and it is suggested that the most favourable alternative lies in making use of the infrastructure already present in the country.

1. Introduction

Methodologies and sources different from those hitherto used in the field of scientific and technological information are required for the effective transmission of the information necessary for the development of the industrial sector, i.e. "industrial information", which is a complex blend of technological, economic and social information.

The best methodologies, like the most frequently used sources, are not always the same in different countries, for they depend on the existence in the country of human resources in the sphere of industrial technology, both in industrial research institutes and in the industrial enterprises themselves. The experiment now under way at the Chilean Institute of Technology is nothing other than an attempt to define those methodologies and sources.

2. The Chilean Institute of Technology and its Information Centre: conception, establishment, objectives and principal fields dealt with

The Chilean Institute of Technology (INTEC), an inter-disciplinary institution for research on and development of industrial processes and products, was established at the end of 1968 as a committee of the Production Development Corporation to fulfil the following basic objectives:

- To carry out research on technology and the development of processes and products under contracts with third parties or its own projects;
- To be familiar with the information services existing in the country, to supplement them and make them available to industry, and also to assemble the documentation required for research or, concretely, for the establishment and/or expansion of industrial plants;
- To contribute to the training of research workers for industry.

The survey on industrial research carried out in Chilean industries before the establishment of INTEC indicated that few industrial undertakings in Chile engaged in this research, with some exceptions where the enterprises concerned usually had both foreign capital and foreign technical assistance, and the research was generally carried out abroad.

It was difficult to attempt to identify the reasons for this, but one of them was, for example, the industrialists' fear that if they established a research unit with skilled personnel and equipment, they would then have to dissolve it once the innovations had been made.

For this reason, an inter-disciplinary institute with which Chilean industrialists could conclude contracts for research work, and which would have at its disposal during the period of the contract research workers and equipment which it could not otherwise have obtained, was thought of as a possible solution.

In order to realize these objectives, the research workers of the Institute remain in permanent contact with industrial enterprises, evaluate their requirements with regard to both research and information and make concrete proposals which materialize in projects contracted both by enterprises in the worker-controlled area and semi-private and private enterprises.

The Institute is active primarily in the following industrial sectors:

- Electronics;
- Metalworking and engineering;
- Chemicals (organic and inorganic);
- Foodstuffs;

and in the following inter-sectoral spheres:

- Enterprise management;
- Industrial design;
- Atmospheric pollution;
- Packaging and transport.

In May 1970, primarily in order to meet the information needs of the research workers - an indirect service to industry, in other words - the institute established an Information Centre. This experiment was to serve as a trial for providing direct information services to domestic industry in future, something which is already being done at present, although with limitations.

For this purpose, the Information Centre has been carrying out a number of jobs, of which the following should be mentioned in particular:

- Establishment of contacts with both domestic and foreign institutions which provide some type of industrial information service in various specialities, and the evaluation of those services;
- Selection and analysis of information in the strict sense, to be placed in archives which contain for the most part only technological literature produced in the country, so as to avoid diverting the scarce supply of literature from foreign sources which is already being examined;
- Preparation, with the help of the research workers, of a common list of descriptors for industrial technology making it possible to store, recover and disseminate information effectively;
- Preparation of profiles of interest to the research workers of the Institute and of some industrial enterprises;
- Comparative study of various information storage and recovery systems.

3. Sources of industrial information

At the INTEC Information Centre, it has been necessary to identify the sources which are most frequently used and most effective.

Generally speaking, two types of sources of industrial information can be distinguished:

- Traditional; and
- Non-traditional.

The following traditional sources may be mentioned, in order of their degree of effectiveness for industry:

- Collections of abstracts;
- Periodicals;
- Books.

These sources also supply a large proportion of the technological information required by industrial enterprises.

The non-traditional sources of information are extremely useful for industrial information and, paradoxically, are:

- Difficult to locate;
- Not fully embraced by scientific and technical libraries;
- Incomplete;
- Etc.

Without passing judgement on their relative importance, we could mention the following:

- Directories;
- Commercial catalogues;
- Patents;
- Standards;
- Agricultural and stock-raising, industrial and mining production statistics;
- Export and import statistics;
- Prices;
- Circulars on credit and investment policies for industry;
- Reports on market studies, feasibility studies;
- Reports on the results of research and development projects;
- Theses written for university degrees, etc.

The INTEC Information Centre, being aware of the importance of these sources, is currently assigning top priority to directories and commercial catalogues, patents, reports and degree theses.

4. The information user and information services, and the question of who initiates the process

In view of the lack of interest of a large proportion of industrial enterprises in making use of information services, it must be pointed out that the way of changing this attitude is through close contact between information officers and the industrial enterprises themselves.

The experience gained in INTEC makes it possible to say that the best results are obtained when the research worker acts at the same time as an information officer - in other words, as the intermediary between the information centre and the industrial enterprise. This is primarily because:

- The research worker studies the industrial processes and can express an opinion on them directly, thereby inspiring confidence in industrialists;
- Through the action of the research worker, the information is transformed into something which the industrialist can see taking a concrete form in the production of goods of a higher quality at a lower cost.

If an industrial enterprise which has become aware, thanks to the research workers, of the information services provided by the INTEC Information Centre requests the information which it requires directly from the Centre, the research workers once more play an important role in evaluating and sifting the information which the Centre has been able to gather in order to send that which is most useful and as specific as possible.

With regard to information services, a distinction is made between those in which the process is initiated by the user (question-and-answer) and those which originate with the Information Centre (publication of bulletins, etc.).

From the experience of INTEC, which is of course limited owing to the brief existence of both the Institute and its Information Centre, it can be said that there is a strong preference in the industrial sector for the question-and-answer type of service; this is not the case among research workers, who use both types without distinction.

5. The Chilean National Information and Documentation System
(Sistema Nacional de Información y Documentación de Chile) and the sub-systems

The SIDOC-CHILE project for the establishment and starting up of an information and documentation system, which is being carried out by the National Information and Documentation Centre (CENID), a department of the National Scientific and Technological Research Commission of Chile (CONICYT) contemplates the establishment and operation of sub-systems organized by specialities or groups of specialities, with work relating to co-ordination, promotion, standardization, training, technical assistance, etc., reserved for the central organization.

Information on industrial technology would be assigned to one of these sub-systems.

This sub-system would be made up of various units which would play the dual role of producers and users of information:

	<u>Production Sector</u>
	Enterprises in the worker-controlled area, semi-private and private enterprises
Co-ordinating unit:	Manufacturing Development Corporation
<u>Planning Sector</u> (ODEPLAN-CORFO)	University or other technological research institutes
Nation-wide standardisation (INDITECNOR */	<u>Research and Development</u> <u>Sector</u>
Patent Office, Institute of Statistics and the Census, etc.	

In view of the inter-disciplinary nature of the research on industrial technology carried out by INTEC, and the existence of a selected group of research workers in permanent contact with national industry and up to date on recent technological progress, one can conclude that the conditions are present for the INTEC Information Centre to serve as the co-ordinating unit for the information sub-systems for industrial technology.

*/ National Institute of Technological Research and Standardization.

The establishment of the technological sub-system would be a great stride forward in the co-ordination of the services of various institutions concerned with industrial information in Chile, some of which are:

- INDITECNOR;
- Patent Office, Ministry of Economic Affairs;
- Directorate of Industry and Commerce (Industrial Register), Ministry of Economic Affairs;
- Chambers of Commerce;
- Manufacturing Development Corporation;
- Institute of Statistics and the Census;
- Costs Institute, Ministry of Economic Affairs;
- Central Bank, etc.

These do not necessarily process only technological information, but may also process economic information and, together with institutions specializing in the processing of technological information such as the technological research institutes, they can handle the complex sphere of industrial information.

This solution appears advisable in as much as, despite the diversity of the services provided by the individual units and the indirect administrative relationship among the units, the existing information and documentation infrastructure in the country is fully utilized, an alternative which is the opposite of trying to superimpose on the present system a network of information centres directly inter-related in a hierarchy.





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