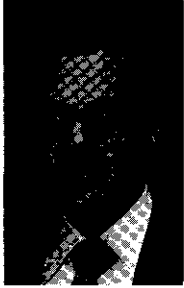


Meeting Importing Countries' Needs

The role of INFOTEC in helping Mexico bridge the gap between needs of industry and government

BY JOSE QUEVEDO*

The industrialization of Mexico started in the middle 1940s and from then to 1970, manufacturing production grew at approximately 8% a year. The policies that were used to foster this industrial development were such tools as tariff protection, tax incentives, and financial aid. The industrialization of the country involved a great amount of importation of capital goods and technology; the result — an industry that produces consumer and intermediate goods to supply local markets — put Mexico in a weak position to compete at an international level and established, at the same time, a continuing balance of payments problem.



J. Quevedo

Corrective action was taken in the early 1970s by launching a program for developing of the capital goods industry. The program was sponsored and promoted by Nacional Financiera, S. A. — The National Development Bank. Legal measures to regulate capital and technology inflows were taken and administrative offices were set up in the Ministry of Trade and Industry to manage and apply them. Recently this same ministry has updated old patent and trademark legislation, making them compatible with these new measures.

Also in the early seventies, and as part of the same corrective action, the National Science and Technology Council was established. One of its functions was to foster the use of science and technology for the socioeconomic evolution of the country. Within the council, in 1972, an information service for industry — now called INFOTEC - CONACYT — was established on an experimental basis. In 1975 this service was transformed to an agency or trust fund (fideicomiso) in Nacional Financiera, S. A. sponsored by the council.

All the above-mentioned programs, laws and organizations have been established in line with the fundamental socioeconomic objectives of the Mexican government, which are to:

1. Generate a high and stable level of employment.
2. Increase the standard of living.
3. Use resources effectively and efficiently.
4. Increase the exports of goods and services.

There is no doubt that industry can contribute to these

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objectives by increasing productivity (reducing costs and expenses), by improving existing processes and products and developing new ones, and by investing to increase installed manufacturing capacity — preferably in the less-developed areas of the country.

What Mexico as a country has to do to fulfill its objectives and to help industry to play its role in the

From the U.S.A. Annual Meeting

socioeconomic evolution is to promote the investment in industry, to strengthen its technological capabilities and increase its bargaining capacity, both at the individual and at the collective levels.

Returning to the topic of licensing, it is worthwhile mentioning that the measures taken by the Mexican Government tend to counterbalance the fact that the technology market is a licensor's market; the measures are needed to make business more fair for the licensee.

The measures, or tools established by Nacional Financiera, S. A., by the Ministry of Trade and Industry, and by the National Council for Science and Technology are used to overcome the drawbacks of a developing country whose industry is relatively new, and which does not have the experience to determine if royalties are reasonable, to search for alternative suppliers of technology, to locate technical resources that can be pooled to manufacture a product, or to find financial resources (both credit and capital).

One of the best ways to increase the rate of industrialization of a country is to transfer technology to manufacture products under license. This has advantages and hazards — as does every business commitment — to both parties. However, the question is: Can licensing meet the needs of technology-importing countries? The answer is not only pertinent to countries that are in the early stages of industrialization — in this sense the question is very well phrased "technology-importing countries" — but to any country, and any company that wants to manufacture under license. Licensing is a good way to start producing new goods and services, but by itself is not enough. The best way to insure that a company will grow and survive is to use the technology under license as a base upon which to build development and design competence. Sooner or later, the products and processes under license will become obsolete; and for that reason the ability to improve present technologies and to innovate has to be established, again at the individual and at the collective levels.

INFOTEC, an information service for industry, aims to contribute in strengthening the technological competence of the country and to stimulate innovation through its programs. Of course we realize that this is a big task, and certainly not an easy one.

We all know, I hope, that the stimulus for innovation

(improvement of existing processes and products and development of new ones) can arise from any source: talks to customers, and among and with salesmen, production people, research and development personnel, etc. We also know that technological strengths and skills are built up through learning and experience. In building up technological strength and a positive environment for innovation, information from both people and from documents play the role of intellectual raw material, which is transformed to final and hopefully practical results (goods and services) by human beings. So if we want to bridge the gap, what has to be done is to foster the growth of people by helping them to become more knowledgeable and by helping them to use information as a working tool, both at the educational level and at the professional level.

INFOTEC's programs reflect the above-stated philosophy, since its mission is to contribute to the socioeconomic objectives of the country by promoting and facilitating the use of knowledge (information) as an economic resource in the production of goods and services.

In order to accomplish its mission, INFOTEC works with industry by providing information and technical assistance to help industrial firms to:

- Learn about modern techniques.
- Solve production problems.
- Identify alternative sources of technology.
- Keep up-to-date with world patents and standards.
- Improve product quality.
- Maintain competitiveness.
- Make better informed decisions.
- Develop new products.

The services which INFOTEC offers are:

1. *Industrial Visits*

Our engineers take the initiative to visit firms and to talk with their professionals, identifying problems and opportunities — to increase productivity and to launch new products. This is the way the need for information and technical assistance in a company is identified. It is important to stress the fact that these visits establish a direct, face-to-face communication with the industrialist, which enables INFOTEC to structure, through an iterative process, work programs to fulfill the specific needs of each company.

2. *Question-Answer and Technical Assistance*

The purpose of this service is to enable the company to obtain quickly and effectively, and at a low cost, the most useful information about its technical problems and business opportunities. Once the need has been identified, the appropriate knowledge (information) at a national and international level is found, wherever it may be, in libraries, documentation and information centers, research laboratories, consultants and government offices, to mention a few places.

This knowledge must then be repackaged, according to the particular need of the company and its environment, in such a way that it can be understood and applied to produce practical results.

3. *Technological Information Dissemination*

Solving specific problems should always be based on the knowledge of what is happening throughout the world in the technological areas relevant to the companies. To help these companies maintain their knowledge, IN-

FOTEC has established an awareness service. At given intervals it selects technical information from more than 450 journals, from the U.S.A., Europe, Japan, Canada, and Latin American countries.

In this program, INFOTEC offers industry a subscription plan that covers bulletins, a yearly exploration of information needs and a plan of access to them; a regular analysis of their technical assistance needs, and a quick answer service to questions that do not involve more than two man-hours to find the information/or data requested.

Before considering the fourth and final service that we offer to industry, I want to describe some experiences which will show the practical results that we are after at the same time. I want to remind you that technology transfer is an exceedingly complex process involving a sensitive combination of technological, economic, managerial, social and political factors. To quote C. Kimball, of the Mid-West Research Institute, "The entire subject of technology transfer should be dealt with in terms of the people-transfer process."

A manufacturer of chemical products came to our office and told us that his company wanted to locate technology suppliers in order to add new products to one of his lines of business. It took about two hours for two of our engineers to define the problem with him. The company was manufacturing a set of products for the metallurgical industry, having started this business about 15 years before under license of a foreign company. Ten years later the licensing contract ended, and they decided to continue manufacturing the products by their own. No step was taken to build an internal technological strength. After five years, the company now is losing market share and penetration. Other manufacturers are offering better products, and they have increased their competitive strengths. The original licensor — from the foreign country — is not a leader in this area anymore, and its products are not different from those being produced by the Mexican chemical company.

The alternatives that were established by INFOTEC working with the company, were to locate new and alternative suppliers of technology or to develop internally the new products needed.

INFOTEC worked through both paths, locating through its information resources — directories and contacts with information centers from abroad — three German companies, two British, and one Japanese that were potentially interested in supplying the technology. At the same time, information about improvements in manufacturing processes and product specifications were obtained.

The result was that the Mexican chemical company updated its knowledge of the technology needed to improve its line of products. In the process of searching for this information INFOTEC made contact with the U.S. supplier of raw materials for these products. This supplier, as part of his sales promotion, offers clients service and technical advice. Because all purchasing negotiations were done by the purchasing department of the chemical manufacturer, the engineering department was unaware of this service, using both the information obtained by INFOTEC and the technical advice of the raw material supplier, the chemical manufacturer was soon able to introduce its first new product to the market, without having to license the knowhow from abroad.

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3. "Barriers to Innovation in Industry: Opportunities for Public Policy Change," Executive Summary, National Science Foundation, Contracts C-748 and 725, September, 1973.

"Technology transfer and Utilization, Recommendations for Redirecting the Emphasis and Correcting the Imbalance," National Academy of Engineering, National Technical Information Service, U.S. Department of Commerce, February, 1974.

4. D. A. Schon, "Champions for Radical New Inventions," *Harvard Business Review*, March-April, 1963.

M. Anbar, "The Bridge Scientist and His Role," *Research/Development*, July, 1973.

5. T. J. Allen, *Institutional Roles in Technology Transfer*, Liaison Program, MIT, March, 1973.

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I must note that INFOTEC's services have been very useful for the National Registry of Technology and for the Registry of Foreign Investment, both of which are part of the Ministry of Trade and Industry. The Director of the Registry of Technology is the Ministry's representative in INFOTEC's Board of Directors.

INFOTEC has supplied information on request to the Ministry of Trade and Industry, about technological alternatives, alternative processes, machinery and equipment manufacturers, utilities, and technology trends. This information has been used to renegotiate license contracts and foreign investments. In these cases information has been used as a tool to increase bargaining capacity.

4. Consulting

The fourth and final service offered to industry is consulting in setting up internal technical information departments or divisions. The idea is to establish a system which has an information department as its core, and which employs participative process, with professionals and technicians capable of understanding technical information, to select, analyze, and apply knowledge in manufacturing operations, in research and development, and in long-range planning. This program has been highly successful.

How ITT Helped the Pulp Industry

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ing with the licensee. While most of the sublicenses were to be one-shot arrangements in which most of the money and most of the technology were to be exchanged very quickly and no long-term relationship would be required, the arrangement with our licensee was to be by its nature a long-term relationship which required fairly high business standards of performance and complete disclosure of problems, gripes, and complaints. This meant that the agreement between our two companies, while scrupulously drafted, had to provide for protections to both sides which would not appear in a standard license agreement, as well as leave open some matters for day-to-day agreement.

A very brief word as to some of the sublicensing that occurred after the execution of the basic ITT-license agreement:

All the licenses so far negotiated have wound up being lump sums, either one large lump sum or a lump sum spread out over a short period of time. I think our projections as to why the paper and pulp companies involved would not opt for a running royalty appear to be coming

true in practice. As an aside, large lump sums of money received all at one time have always given me greater satisfaction than much smaller quarterly reports spread over a period of years.

The licensee has been using the basic format of the ITT-license arrangement in negotiating contracts with the sublicensees, but with important personalized additive paragraphs picking up the individualized problems of each sublicensee. In the ITT-license agreement, we did not specify a form contract required to be executed by each sublicensee as part of our flexibility scheme. This seems to be happening naturally.

ITT is fairly proud of the program and it has been mentioned in our Annual Report. Our contribution has been publicly recognized. More importantly, in view of our success in the paper and pulp industry, we are giving very serious consideration to expanding it to other industries. To me, that is the best indication the program is right.

The atmosphere is cleaner around some plants in this country and in Canada because we pushed a licensing program. We have achieved good income from an unexpected quarter.

Japanese Experience in Licensing

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West in terms of industrial and military strength in the first 70 years and in terms of industrial strength in the following 30 years.

Today, Japan has grown economically and is on the technological level comparable to that of Europe and the United States.

However, it is at the same time true that this growth of Japan has been attained at the cost of various side effects, such as pollution.

The reconsideration of the past orientation which placed too much emphasis on economic growth and the groping for a direction in which we should proceed from now on have become a central theme of Japan in the 1970's.

The future direction of Japan would have to be formulated on the basis of a thorough review in the 70's of the political, economic, social, national defense, and other aspects of Japan. I believe that in such formulation efforts, serious attention should be directed to:

1. The role of Japan in Asia on the basis of the U.S.-Japan cooperation.
2. Due regard to the special conditions of Japan and to people's welfare in economic growth and technological development.
3. Economic and technical assistance and cooperation to developing countries.
4. The balancing of still immature individualism based on democracy introduced in the postwar period and collective orientation based on Japan's historical and geographical backgrounds.

What is imperative in such efforts would be that evaluation and decisions need be made not from the viewpoint of Japan alone but from the international viewpoint in terms of cooperation and free competition.

Naturally, this would be reflected in licensing in various manners. I now shall try a brief overview of the major trends and characteristics of licensing in the coming