



Martin Goland

LICENSING OPPORTUNITIES IN EXPANDING MARKETS

by
*Martin Goland**

I am privileged to have the opportunity of keynoting this important and comprehensive meeting on licensing matters, but the situation is not without its awkwardness for me. As keynote speaker, I should be able to provide some novel and penetrating perspectives, and utter wise words about licensing which have thus far escaped your notice. Unfortunately, I shall disappoint you on these scores.

Nevertheless, I cannot profess total ignorance in the field of licensing. At Southwest Research Institute, which is a relatively large research and development organization serving industry and the government, we do have an active licensing program based on staff-conceived ideas and specialized know-how. It is somewhat paradoxical, however, that we turn to licensing reluctantly, and only when it is the best avenue by which we can further develop a technical area. For the most part, novel and useful ideas born within our staff are used as the bait for sponsored research and development projects, with proprietary rights reverting to the client. Occasionally, however, the course of events forces us into a licensing approach so that we can work with a number of non-competing clients rather than a single one.

Some of our license agreements even include provision for royalty payments, but I must confess that the benefits to date from this source have been small compared with the project advantages we have achieved as a consequence of our licensing position. In this regard we have something in common with the scientist-husband featured some years ago in a much overworked joke. When his wife told a friend she used

twelve yards of filmy material to make a nightgown, the friend protested that the amount of material was far too great. "Not for a scientist", was the reply, "for him it's much more fun searching than finding."

Having thus qualified myself, let me proceed with a few observations on the licensing scene.

The Climate for Licensing

Despite the extremist campaigns of the past several years, it appears that neither society nor Congress will outlaw technology in the near future. In fact, as sober thought replaces impulse and emotion, we are becoming more aware than ever before of the extent of our commitment to a technological future.

The essence of technology is to control natural forces and alter natural materials to better serve the needs of man. Changes — in material things, in culture and society, and in the environment — are inextricably bound up with technological advance. It would be surprising indeed, in a movement which gathered momentum so swiftly from its serious beginnings some two centuries ago, if there were not periodic difficulties and excesses. Child labor was, for a time, a disgrace of industrialization. Working conditions in many early industries degraded and exploited the worker. The list can be made a long one, and extends to today's indignation against urban blight, ecological mismanagement, and natural resource wastage.

Despite these shortcomings, the balance in terms of human welfare is overwhelmingly in favor of technology. In societies which have embraced technology, history has been a steady climb upward, at least in terms of averages, out of the mire of hunger, disease and want. The argument needs no proof or embellishment here; I am sure each of you has examined his professional conscience and arrived at a solid conviction in favor of technology, even while recognizing the trials and pitfalls of progress.

It is, in fact, becoming evident that in the increasingly populous world which lies ahead, only advancing technology can save us all from ruin. For the resident of the most modern of today's cities, just as for the poorest citizen of the underdeveloped nations, only advancing technology holds out the hope for a better future. Environmental pollution in the advanced countries is a blight which can only be solved by better science and engineering, even as the poorer nations strive mightily to advance their levels of technology to the point where they, too, will have to wrestle with pollution problems.

In a real sense, the practice of licensing is one of the lubricants which helps the technological engine to turn. Concepts, ideas and know-how developed by one company are caused to work for the benefit of other companies to the mutual advantage of all concerned. Knowledge is transferred effectively, and wasteful duplication of effort is minimized. As the pace of technology grows more intense in the years ahead, the level of licensing activity will also increase. In fact, it seems clear that the role and function of licensing will become proportionately even more significant in the years ahead.



General Assembly of LES in San Antonio.



Registration of wives.

The Growing Pace of Technology Transfer

As I have already noted, licensing is a part of the technology transfer process. A number of factors point towards an increased tempo in this area, which will in turn make licensing a growing business in the years ahead.

The term "technology transfer" came into vogue as part of the effort to translate the results derived from military and space research and development into a more broadly useful base for technological advance. The early program efforts along this line were not particularly successful, largely because they stressed a straight-line relationship between results derived for a military and space purpose, and the civil market where they were supposed to find ready application. I need not remind you gentlemen that new ideas seldom travel in straight lines from conception to application. The route is more circuitous; there appears to be a built-in period of milling about, waiting for a time when the necessary marketing, financial and engineering factors come into consonance with the idea itself.

Nevertheless, based on a more mature approach taught by experience, an increase in the role of government in technology transfer is inevitable. The spectrum of governmentally funded developmental programs with end-product implications is, in fact, broadening. Once restricted almost entirely to the military and space fields, government sponsorship is now intruding into the fields of the environment, transportation, housing, and energy, to name but a few of the civil areas in which federally-directed programs are developing. Even more direct aid and support for technological innovation is contained in newly originated programs of the Department of Commerce and the National Science Foundation.

As I'm sure you are all aware, there is also the spectre of a new government role in the form of compulsory licensing. The Clean Air Act of 1970 already contains certain loosely worded provisions for compulsory licensing of patents related to air pollution control. There are proponents for extending compulsory licensing in other fields of public interest, although I understand that the weight of opinion among knowledgeable persons is not sympathetic to this view. Based

on my own limited understanding, I would tend to agree that a broad application of the compulsory licensing principle would not work for the overall public good. The essence of our patent and license system is to afford the developer free choice in the exploitation of his original ideas. Without this incentive, much of the drive for product and process innovation will be diminished.

While the individual rights of the inventor must be protected, in a certain sense the issue of compulsory licensing is becoming increasingly academic. As a practical matter, the flow of technology from one group to another is becoming faster and easier, even when deliberate efforts are undertaken to prevent it. This applies to the knowledge flow from one company to another, as well as from one country to another. Technological protectionism, in short, is an unworkable policy today, and will become increasingly impossible in the future. Many companies already recognize this; note the increasing tendency to value a patent position more for its defensive qualities, rather than as an offensive weapon to be used against the competition.

Technological Protectionism in International Trade

The issue of protectionism has come into prominence in recent years because of the delining trade balances experienced by the United States in international markets. The argument has been raised that much of this, particularly in high-technology areas, is due to the export of U.S. know-how to foreign nations with lower labor rates. Such nations, buying their technology relatively cheaply through licenses, thus gain a competitive advantage over U.S. production. The Japanese electronics industry is the classic example usually quoted in such discussions.

Those who argue for protectionism are, unfortunately, misguided from a number of viewpoints. Perhaps the greatest error is the belief that legal barriers can prevent the spread of technology. Science and engineering are a deeply embedded part of the culture of all advanced nations, and they speak a universal language. Attempts to impose geographic boundaries on the flow of technical knowledge are doomed to failure.

The rate of technological transfer between nations is, in fact, steadily increasing. In an excellent paper, Richard N. Cooper¹ makes this point convincingly. As an index of the rate of diffusion of international technology, he chooses the average number of years between first production of an industrial innovation in the innovating country and the appearance of the same innovation in the production of other countries. In synthetic rubber and synthetic fibers (15 innovations, 1897-1949) the indices are 8.8 years for the United States; 10.3 years for France; 7.4 years for Germany; 14.7 years for Japan; and 8.3 years for the United Kingdom. In the plastics area (20 innovations, 1870-1957) the corresponding figures are 5.2 years for the U.S.; 8.7 years for France; 6.1 years for Germany; 14.0 years for Japan; and 8.7 years for the United Kingdom.

Consider now the semi-conductor field. Cooper reports two studies (8 innovations, 1951-56; and 5 innovations, 1956-63). The index figures are: United States, 0.1 years and zero (all innovations within the U.S.); France, 3 years and 2.6 years; Germany, 2.4 years and 2.6 years; Japan, 3.4 years and 1.2 years; United Kingdom, 2.6 years and 1.6 years.

These data and other considerations support Cooper's conclusion that while it took some twenty years for an innovation to move from one country to another during the nineteenth century, the transfer lag had been reduced to less than ten years in the second quarter of this century, and to less than three years during the 1960's.

There are various reasons for this acceleration in international diffusion. Cooper ascribes it to improvements in communication and transportation; attitudinal changes in foreign countries — a greater willingness to accept new ideas and new ways of doing things; and the very rapid growth of American investment abroad, notably in Europe. The role of the multi-national corporation is, of course, an important and growing one in the whole of international trade. American subsidiaries are often the first to introduce U.S. innovations to foreign markets. Even more important, management and technical skills are exported along with capital investment, and these quickly find their way into the industrial life of the receiving nations.

The overall conclusion is thus that protectionism in technology is not a supportable policy. Licensing is, in fact, the ethical way in which an inevitable knowledge transfer can be accomplished to the benefit of both the innovator and the subsequent user.

The difficulties of the U.S. international trade situation are, of course, real, but the cure must come from directions other than protectionism. The topic is too complex to permit detailed discussion here, ranging from international monetary policies to the readjustment which is taking place world-wide in common-market agreements. One source of U.S. woe is undoubtedly the slow rate at which the productivity of American labor is growing in comparison with other nations. New technology is the lever by which productivity is raised, but it is unable to compensate fully for a standard of living for the U.S. people which is growing even more rapidly, and in many instances for

a reduced work-effort on the job. Too many of our employees today are confusing the "good" life with the "easy" life.

Some Licensing Trends

In my final remarks, let me say a few words about some new emphases that will influence future licensing activities. These thoughts are particularly relevant to companies with significant research and development programs, and thus with licensing spin-offs which are broadly based.

I have already alluded to the belief that information will flow ever more easily in the years ahead, and that a voluntary sharing of technology will ease a process which is in any event inevitable. From a different point of view, it can also be said that many more opportunities will arise for the exploitation of a particular technological innovation than have been characteristic in the past.

It is by now a truism to note that modern problems in technology have grown more complex and multi-disciplinary. Science and engineering could once be separated into neat compartments, but today each effort calls for a wide variety of supporting talent drawn from a number of specialist areas. Even the concept of the specialist has changed to include a broadened scope of training and disciplinary coverage. The modern research and development team thus embraces a far greater diversity of interests and experience than was the case in the past.

With a creative staff, the corollary to this circumstance is a flow of ideas which inevitably extends beyond the boundaries of more immediate research and development concern. The skillful research director, in fact, encourages the kind of free idea association which often leads to the unexpected invention or innovation. When this occurs in areas other than those of relatively direct corporate program interest, licensing is the obvious answer for further exploitation of the idea.

Licensing opportunities are also expanding as a consequence of the increasing realization of the "spin-off" potential of technology derived for one purpose, but with application to other areas as well. As you are aware, this subject has been discussed with avalanches of words many times before; it is, I am afraid, one of the current fads to talk knowledgeably about "spin-off" when research directors get together. Despite the wealth of verbiage, there can be no doubt that there will be an increasing traffic of ideas and know-how between fields which have little apparent connection with each other in the marketplace.

Licensing opportunities will thus expand, but not without the usual ingredients of creative imagination, talent and hard work. For the licensing executive, it seems to me, both the challenges and the potential rewards are escalating. In order to take maximum advantage of the exciting period ahead, he will have to know more about more things, and he will have to devise new techniques which are appropriate to the changing environment.

Let me give you one example. In the technology

transfer process, it would be highly unusual for the transfer to be accomplished without significant and substantial modification of the original idea content. A welding process devised for the aerospace industry may well have application in the automotive industry, but the economic, and even the technical requirements will differ materially for the two fields of application. To successfully adapt the innovation from one field to another thus will entail money and resources, often in substantial amounts.

A cooperative developmental program between the innovator and the potential users may well be the answer in such cases. I need not point out to you the variety of organizational and legal problems such ventures entail, particularly if the work is to be done in-house by one party or the other. Overcoming such obstacles, and organizing a sound and mutually acceptable development program may well be an integral part of the licensing executive's responsibility in the future. As a passing comment, I might note that organizations like Southwest Research Institute, an independent yet highly competent research and development agency, might well provide the neutral territory where such ventures can grow and prosper.

In summary, let me again express my appreciation for the privilege of addressing you. Technology in the decades ahead will continue to profoundly influence the directions of our society. Immersed as we are in the mechanics of technological change, we share the adventures which the future will bring. At this point in history, I cannot think of a more exciting and satisfying role.

**About the Speaker: Martin Goland is President, Southwest Research Institute.*

¹Cooper, Richard N., "Technology and U.S. Trade: An Historical Review", Symposium on Technology and International Trade, National Academy of Engineering, Washington, D.C., October 1970.



Stephen J. Gilbert

ENTREPRENEURSHIP, LICENSING, AND NEW ENTERPRISE FORMATION

by
*Stephen Jay Gilbert**

I am honored to have this opportunity to address the Eighth Annual Conference of the Licensing Executives Society. In keeping with previous LES program formats, I shall begin by providing information about my company, the INSTITUTE FOR NEW ENTERPRISE DEVELOPMENT (INED). Then, I shall speak about a program that we are running for the Office of Economic Opportunity and consequently, the implications for expanded licensing opportunities that evolved from this program. As these opportunities expand, the flexibility and capabilities required of the licensing executive must also increase. I shall be previewing the types of systems which may be available to aid the licensor in the multiplicity of his future duties.

INED is a non-profit organization formed to promote economic development by helping entrepreneurs systematically create new enterprises. INED is currently working specifically with entrepreneurs willing to locate in poverty areas. Our staff of 12 professionals covers a wide range of combined expertise as exemplified by the following various individual accomplishments and capabilities:

- Entrepreneurial development of more than nine existing companies
- Management of multi-million dollar organizations and turn-around situations
- New venture analysis for industry
- Team building analysis and trouble shooting
- Business curriculum development
- Business opportunity development, and
- Urban economic development

INED's approach is based on the collective experiences and capabilities just noted in conjunction with subsequent development work done when the principals left their positions in industry to join the staff of MIT's Sloan School of Management.

Prior to jumping into INED's program, a brief overview of the new enterprise formation process is appropriate. Before you, I have pictured the three elements most commonly referred to as necessary for a successful new business (see Figure 1).

Venture capitalists, bankers, and business researchers all agree that the single most significant factor in business success is THE PEOPLE, that is, the entrepreneur *and* his team. Many of my colleagues here today have probably had the opportunity to watch inventors (with very sound products) unsuccessfully seek financing. Alternatively, some may have had the experience of obtaining a favorable license from a new venture group which one or two years later filed for bankruptcy. The fault has most often been traded to THE PEOPLE and not the idea.

The second element is a VIABLE IDEA. Without a sound product, the best entrepreneurial team can barely keep its head above water. Still, the product takes second place to the people because as just mentioned, even with a great product, a poor team