

Licensing — A Means, Not An End

Success depends on ability to grasp new range of business dynamics and relationships

BY DR. DOUGLAS E. OLESEN*

My message today will cover (a) our experience at Battelle in the licensing area, and (b) the impact of our rapidly changing industrial world and the new global marketplace on business — therefore, licensing.

In describing our own experience, I must tell you that we at Battelle are in the process of studying our intellectual property transfer activities — to determine how they can best increase our effectiveness. Now in some organizations, this study might not have the highest priority. But in our case it does — because the transfer of intellectual property in one form or another is our main business.

Many people identify Battelle as one of the major U.S. R&D organizations engaged in contract research. Last year, we had underway more than 4,000 studies for over 2,000 industrial and governmental clients at research centers in the U.S., Germany, and Switzerland. But there are other aspects to our business, such as product development, on-site technical assistance to clients, management of large programs with a high technical content, education, and *commercialization of technology*. I underscore that last item.

You may also be interested to know that we have an independent, wholly-owned subsidiary — the Battelle Development Corporation. It was created 50 years ago to license Battelle-owned intellectual property for economic utilization by industry, primarily by licensing to existing companies throughout the world.

We have had both successes and failures at Battelle in licensing. Yet, even with the success, we have not moved toward concentrating our spending on creating and developing new ideas strictly for the purpose of generating income through licensing.

Our reasons for this position are:

1. Investing in new technical developments strictly for the purpose of generating income through licensing is a very risky business. We have learned that, for us, licensing is a means, not an end, in building an organization that is innovative, market driven, and financially sound.

2. It is extremely difficult to recognize the real value

of inventions in their early stages. In addition to the great human effort and financial resources usually required to make them a success, there is a great deal of pure luck involved.

Industry Participation

In most cases, the factors that contribute to the large successes either do not exist or are not recognized at the time the product is first commercialized. Also from experience, we know that success requires the early participation of industry. The primary ingredients for success were either created by or recognized by our licensees — not us.

Now, I want to focus on my second major point. That is the effect of our changing global marketplace and industry on licensing.

In our rapidly changing industrial world, licensing is not an *end* in guaranteeing technological advancements, profits, and a better quality of life. Rather, it is a *means* in helping the business world move through a period of rapid industrial change and in attracting those companies in the best position to turn intellectual property into profit. Accordingly, I believe that the great challenge ahead for licensing is *the rapidly changing nature of business and industry — and the ever-pressing need to be knowledgeable about these changes and to support the business world in dealing with them.*

Today's drive for improved technology and a better standard of living is being done in a global economy which is far removed from the more predictable conditions of just two decades ago.

Visualize, if you will, the dramatic changes that have occurred in the world during the past two decades — the rise and fall of the oil cartel; the computer age; robotics; lightening-fast communications; cable television; Japanese industrial development; and the Concorde. The world has changed and the marketplace is exceedingly different.

In the mid-1960s more than 75% of the world's technology was generated in the United States. Today, only about 50% of the world's technology is American — and that is predicted to fall to about 35% by 1995. We are witnessing a rapid and diverse movement of technology throughout the world.

Across the globe, business, governmental, and academic leaders are placing a high priority on technological development — and creating a new and very different marketplace. We are seeing fast changes in the fields of electronics; communications; information systems; biotechnology; mechanical design; materials technology, and chemical processing.

In manufacturing, changes in strategies and proces-

*Executive Vice-President and Chief Operating Officer, Battelle Memorial Institute, Columbus, Ohio; paper presented at LES U.S.A./Canada Annual Meeting, Los Angeles, Calif., October 1986.

ses are occurring in the U.S. and throughout the world. Automation and computer-aided manufacturing systems are providing new and less expensive ways of producing goods. In American manufacturing we are seeing the emergence of a changing culture. Manufacturing cycle times are getting shorter. Firms are moving to a broader and broader variety of products. Flexibility in manufacturing will be the key consideration. A major development in manufacturing now is that more people are "getting up to speed" simultaneously.

Improved Communications

There is vastly more competition and more people are aware of new developments because of improved communications. In turn, the American manufacturing industry is being forced to compete in markets outside the U.S. — not only the big companies, but the medium companies as well.

Further, the areas of steel manufacturing technology and paper manufacturing will undoubtedly be influenced by change during the next few years. The Japanese continue to impact the world manufacturing arena — and a more recent development is that they are going "offshore" in their manufacturing efforts. They want to bring some of their manufacturing to the U.S. and they want to accomplish it through joint ventures with the U.S.

Clearly, they are willing to entertain new ideas for collaboration. In addition, the Japanese are finding that they are now being confronted by the same problem that afflicted American industry 10-15 years ago.

Some of their own industries are now being challenged in the competitive marketplace by the Koreans who have more contemporary equipment and factories. Some of these factories were even built through Japanese expertise.

The Japanese have responded to this challenge by considering investments and initiatives in Korea and other far Eastern countries. We see other clear signs of change in the international marketplace. In some nations, government postures are changing to make it easier to do business in their countries. To some degree, there is a changing attitude toward foreign ownership.

In countries such as India we have observed a gradual streamlining of the permit process — due, at least in part, to a strong government determination to increase the flow of technology. There are also some indications of this strategy in other Southeast Asian countries. We are seeing a movement in many developing nations toward the use of indigenous resources. Where we may lose our market for products, we may well increase our market for processes.

From my vantage point at a large international technology organization, I can also tell you that another clear sign of industrial change is that R&D spending is on the rise. In the U.S., in Japan, and throughout the industrialized world, spending on R&D is up.

Consider these indicators: Both Japan and West Germany continue to spend more than the U.S. on non-defense research. And, it is interesting to note that Japan's Prime Minister Nakasone has set a goal of achieving, by 1995, an R&D investment level of 3.5%. By comparison the American percentage of GNP now being spent on R&D is about 2.7%.

During the past several years, U.S. industry has averaged an increase in R&D spending of at least 5% a year. Total U.S. expenditures for R&D will increase 9.5% during 1986. U.S. industrial funding in 1986 is expected to be approximately \$58.2 billion, representing an increase of \$4.97 billion over 1985. U.S. federal government funding in 1986 is expected to be about \$54.5 billion, an increase of \$4.8 billion from 1985.

I certainly agree with *Forbes Magazine's* recent article on R&D, which says, "The renewed interest in R&D almost guarantees a flood of new products from U.S. companies in the years ahead."

Given this new global economic order, we should stop to ask ourselves: How are companies generally reacting to the new marketplace? Where are they headed?

Let me share my perspective with you, which is based on a series of visits that I made recently to a number of American companies. I have 10 major observations as a result of my last round of visits.

1. Leaders in business and industry are concerned about the viability and durability of the technology base upon which their companies are built. And well they might be, for product and process changes are coming at a much faster rate than ever before and competition comes from the most unlikely places.

2. Business and industry leaders are concerned about the ability to bring products from the laboratory to the marketplace more rapidly. They want to shorten the time required to move an innovation into the marketplace.

For example, contrast the introduction in the 1950s of electrophotography to the market — a 22-year process with the introduction in the 1980s of the video tape recorder — six years.

Management Philosophy

3. In many respects, we are seeing a new management philosophy. Much greater value is now attached to new-product development — perhaps to the detriment of new-process development and to productivity, in general. Nevertheless, product development commands more and more of top management's attention. Business leaders see new products as the key to diversification — the way to avoid being suddenly overrun by new technology and ending up with a company with neither markets nor options for the future. Also, leaders are scrambling for technology leading to specialty products.

In some companies there is a major emphasis on finding a niche in the market for specialty products — as opposed to commodities and products available from various sources. Under this new management philosophy, the strategy is to come up with high-value products to offset profit losses and declining markets in bulk commodities. For economic reasons, many of the commodities can, and must now be produced or procured offshore. They simply can no longer be produced at a competitive price in the U.S. and other highly industrialized countries. So, there is a lot of time and money being spent in industry trying to identify new products and in focusing on the technologies to obtain them.

Another aspect of the new management philosophy is "people movement to produce change." Today we are seeing an increasing movement of people with technical ex-

expertise within companies. And, from one company to another. These are the change-makers.

A final component of this new management approach is an overall readiness to change and an openness to new ideas. Leaders are adaptive and *aggressively* seeking new ways to improve performance and productivity.

4. Senior executives are increasingly thinking "international." They want to compete in new international markets and many want good business connections with the Japanese. Moreover, they are interested in how outside and global events affect their business.

5. There has been a marked change in the attitude of industrial leaders in their approach to the acquisition of new technology. Only a few years ago the management of many companies — particularly the larger ones — never considered looking beyond their own organization for new technology. There was a sense of self-sufficiency. Many companies backed away from ideas or concepts that required risk and a long-term reward. I believe this generalization applied throughout the industrialized world, with one notable exception, Japan.

The Japanese have done a remarkable job of going about the world acquiring technology and applying it successfully to their own needs and taking technical risks. What we are seeing now is recognition that no company, no matter how large, can rely entirely upon its own internal resources to stay competitive.

Again, the world of industry and technology is simply moving too quickly. And, just as importantly, companies that are involved in this new marketplace must make more technological decisions. This is a new role for some executives.

6. Companies want the best outside expertise available to help them solve their problems. And, increasingly, they want people with very strong specialties and in-depth experience.

7. There is greater devotion to strategic planning, with a heavy emphasis on business diversification and the impact of technology.

8. Companies want control or ownership of technology.

9. We notice that even in cases where companies do not go beyond their own organization for R&D, there is a good deal happening internally to generate technology and do so more quickly. We are seeing a whole new attitude in some companies — an attitude that encourages ideas and a supportive system to evaluate and develop them. Many companies — particularly the larger ones — have set up mechanisms within the organization to encourage employees with an entreprenuring spirit.

10. Business leaders are using all kinds of imaginative approaches to reach outside for new technology and innovations. Many companies are seeking flexible business relationships. Interestingly, this is giving rise to a greatly increasing number and complexity of business ties. Some large companies are, for example, becoming limited partners in venture-capital partnerships created to invest in new and existing technically-oriented companies. The prospect for capital gains is not as important as having a "window" on new technology. The kinds of companies in which the partnerships invest are small ones on the leading edge of technology. For companies investing in such partnerships, this is a way to stay abreast of fast moving areas of technology.

What they see may subsequently lead to a variety of business deals. This approach has created a whole new

arrangement where people with new ideas and concepts have an opportunity to discuss them with potential buyers, often large companies.

Further, joint ventures and joint projects appear to offer even more possibilities for innovation. In the U.S., we see new joint ventures announced every day. And, many of these are international in character.

In addition to joint ventures, we are seeing a trend toward large cooperative research programs involving many companies. In recent years, there have been a significant number of these consortia created in the U.S. and Europe. In the U.S., this trend has been encouraged by the National Cooperative Research Act of 1984.

While it is difficult to accurately estimate the number, there are now dozens and perhaps hundreds of examples of this kind of cooperative R&D program. Many of the cooperative programs can be termed "precompetitive," as opposed to "noncompetitive," which means that the technical base required to stay competitive is beyond the capability of any single company to develop or sustain. These new, imaginative approaches are all driven by the current desire to more rapidly acquire technology and apply it.

My point to all of this is that we are living in a very dynamic business era and that technology is moving rapidly in many different directions.

Quick Moves

Like a championship basketball team in a fast-paced game of multiple offenses and defenses, businesses will have to make intelligent decisions and move quickly to capitalize on opportunities. That won't be easy, because competing players have multiple skills, adjust quickly to new tactics, and are faster than ever before. Businesses will have to aggressively seek new ideas, develop and continue an international perspective, be willing to take more risks, and maintain an organizational attitude supportive of change.

What will be licensing's role in the midst of this dramatic business period and an increasingly global economy? It needs to stay abreast of these global and national changes and needs to be there to help the business world adjust to these changes, deal with these changes, and continue to make progress.

Hopefully, my perspective about the global marketplace will assist you in thinking about how this situation impacts your own organizations.

In closing, I want to emphasize that the age of the global, high-tech economy has ushered in a whole new range of business dynamics, complexities in marketplace relationships, government initiatives in technology development, and fresh approaches to problem-solving.

Innovation, the growth of our national and international economies, and technological progress will depend on our ability to grasp these new relationships, to work within increasingly different "rules of the game" to get products to the marketplace, and to understand that our new era will require many unique approaches to new problems.

The membership of LES has been at the forefront of technology transfer and I believe your knowledge and experience will be critical in meeting the vast challenges of the future.