Research to Realization via Campus

Utilizing university research can save companies R&D costs and delay research payments

BY MARVIN D. WOERPEL*

We at the Wisconsin Alumni Research Foundation (WARF) have been involved in moving Research to Realization since 1925, and licensing has been the structure of every bridge we have built between the University of Wisconsin and industry. In playing with the theme, "How Licensing Bridges the Gap," during that period of "not-yet-dedicated" preparation, I coined two titles or subtitles which emphasize different characteristics of this particular technology gap:

M. Woerpel

LICENSING AS A BRIDGE TO THE UNDERDEVELOPED NOTIONS

and/or

THE LICENSING CONNECTION BETWEEN THE REALM OF THE RANDOM AND THE LAND OF THE LINEAR

Those too are, I believe, relevant titles. Nearly always university research results are underdeveloped and are usually the fortuitous practical result of a fundamental inquiry not originated because of its commercial merit. Each of these factors makes acquisition by licensing especially attractive.

As my last subtitle suggests, on the one hand I perceive the goal of industrial, i.e. market-oriented research, to be a linear progression from concept to product. Research which does not fall close to this line must usually go unfunded in Linear Land. Yet, on the academic side, in the Realm of the Random, research is conceived and justified on the basis of an entirely different set of motivations. I do not mean by the use of the term "random" that academic researchers have no grand design or purpose to their research. The term "random" is applied because their research is not designed to produce a specific advance in moving a project to the point of marketability as it would have to be in most industrial research.

Corporate security may lie in incremental advances that can be produced by the linear approach. Excitement and drama, however, come from breakthrough discoveries which can create new markets. Everyone wants to copy the Xerox experience.

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Random U frequently produces discoveries which offer more than incremental advances in an art, truly new product possibilities. It is in the Realm of the Random, I submit, that industry has one of its best chances to identify totally different products or services that can dramatically change its future.

From the LES U.S.A. Annual Meeting

University research will also "accidentally" produce answers to questions of current interest to someone's industrial research program. Therefore, it behooves the industrial R&D director to continuously monitor this source of possible boosts to his product-development programs. The acquisition of such useful discoveries through licensing arrangements is also the subject for this discussion.

WHERE TO BRIDGE

"But," I hear you say, "How will we learn that a product or service has been discovered at a university?"

Fortunately, there is a favorable answer to this question. An ever-increasing number of universities have established patent or technology offices. They are appointing administrators to perform this important purpose. The Universities of Iowa State and the California University System are two which have long and successful records. The University of Wisconsin has been served for over 50 years by the Wisconsin Alumni Research Foundation, which is not part of the University itself. Many other universities have contracted for such help from the Research Corporation, which, of course, is also an outside organization. Whether inside or outside, each provides an entree to the research results at the universities and colleges which they represent.

The growing concern the universities feel for this function is manifest in the new organization, Society of University Patent Administrators (SUPA). A list of SUPA membership and a similar list published in June 1975 *Les Nouvelles* will provide you with the names of those who may help your company find its next major product.

The people so listed are not passive representatives of their organizations. Most are aggressive in their quest for industrial "partners" for the new discoveries brought to them. All are anxious to know of your technology needs and to learn of the particular marketing skills which your companies possess. A close and continuous liason with these people is your best and surest way to being considered for the next Xerox.

Is it worth your trouble to keep in touch with the many university administrators and to cross the technology gap?

The September 1976 issue of *Research Management* reports that the combined research budgets of U.S. universities will be $3.4 billion this year. Most of this *is* your tax dollar. You should be interested in its result.

I would hasten to warn that in all probability your university contact will not have *the* product for you the first time you call. At least at WARF our successful bridges have been sparsely spaced. Those who have trod them, however, have enjoyed nearly $2 billion of business volume, collectively.

The gap can be worth crossing.

WAYS TO CROSS

You in industry can cross the gap by invading Random Realm to establish a beachhead whereby you obtain technology directly through the hiring of employees or consultants.

You may, by sending CARE packages (grants) to the universities, infiltrate and attempt to reorient the random nature of certain academic research and thereby induce the results to fall more nearly into your linear requirements.

Both of these methods are valuable and should be continued, not only for their direct results, but because through such contacts you can become aware of other research in progress in the university which may also be of interest.

The time to cross the gap via the noble license structure, however, is when you have learned that a product, process, or service that you want for your business has already been discovered in a university.

OBSTACLES

Before you can effectively negotiate a license bridge for these inventions (either the incremental advance or the breakthrough invention), you must understand the nature of the gap which may exist.

We have already identified a major difference in research motivation on opposite sides of this gap. When a research result has been identified which justifies its acquisition by industry, the original motivation for the work will probably not be of continuing concern. The personalities and thought processes of those who will continue to be involved in the transfer process, however, are important. Those who quest for knowledge is best satisfied in the atmosphere of Random U may have a different language, a different attitude toward costs, time schedules, and the economics of overhead and profit expectations than those who pursue such knowledge in the laboratories of Linear Land. These differences may loom as obstacles in the transfer process unless recognized and "designed" around in the arrangements which establish how the parties will work together.

Reference

Several have written about these and other barriers to technology transfer across this particular gap. Tom Evans, Director of Research at Michigan Tech University, treats this problem in his provocative paper, "Triggering Technology Transfer," in *Management Review,* February 1976. It is concerned with the differences which exist between the parties on the two sides of the transfer process and lists five specific problem areas.

1. The gap between idea and prototype.
2. The communications gap.
3. The disparity between buyer's concept and seller's opinion of the new technology's worth.
4. The buyer's refusal to recognize value of "outside" technology.
5. Bias of interpretation of the risk vs. return axiom.

You may well carry certain "chips on your shoulders," certain preconceptions about the worth or even the validity of a particular technology. One of the strangest coteries is the many men I've met over the years who have told me almost pridefully that they had turned down Xerography for their companies. You may be saying, "They haven't even got a prototype; what and where is the market for it? Does anyone know what it costs? What will the profit margins be?"

On the university side, someone who has never before built a bridge may be saying, "They probably only want to control my 'baby' so it won't threaten their current products;" or "There are 220 million people in the U.S. and everyone will want or need one per week x 52 times at 20% royalty;" or "I built it with grad student labor for $200, so it should sell way below the competitor's price of $699;" etc.

Here we can recognize at least the first two of Tom Evans' points: (1) a communications gap; and (2) the gap between idea and prototype, which may very well lead to the misunderstandings in point (3), i.e. the worth of the invention, and quite possibly to a difference of opinion over the risk/return potential of point 5.

These differences can become obstacles to efficient technology transfer. They need not be.

The point I'm making is, that with university research results, neither side has a valid basis for establishing the present worth of the invention at the time responsibility for the technology is actually being transferred. For this reason alone, a traditional Buy-Sell deal is almost an impossibility.

AVOIDING OBSTACLES

The patent license agreement, however, is ideal for this situation for several reasons. A delay of a substantial time, even years, before the true value is established is workable here where it might not be elsewhere. For,

While universities are admittedly in constant need of research funding, the university research program is not predicated on a quick buck from the subject invention.

And,

U.S. patent protection can be sought for a relatively minor investment, but will provide a long term property right which provides time for better evaluation of the technology.

For these and other reasons, you may find your university counterpart to be willing or even anxious to set royalty rates later, when both sides understand the invention's worth more clearly, thus obviating to a major extent the potential conflicts enumerated by Tom Evans.

THE LICENSING BRIDGE

When you approach the gap, wearing your bridge-

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574 (6th Cir. 1968) cert. denied, 374 U.S. 920 (1969).
14. *American Cyanamid Co.*, 63 F.T.C. 1747, 1891 (1963).
15. See, e.g., *General Railway Signal Co.*, F.T.C. 882 (1964); *Standard Oil Co. (Indiana)*, 74 F.T.C. 141 (1968); *Swingline, Inc.*, 76 F.T.C. 407 (1969); *Occidental Petroleum Corp.*, 77 F.T.C. 710 (1970); *Koppers Co., Inc.*, 79 F.T.C. 837 (1971); *Rockwell International Corp.*, 84 F.T.C. 79 (1974); *Walter Kidde & Co.*, Docket No. 8957 (consent order accepted June 29, 1976).
16. *Xerox Corporation*, Docket No. 8909 (consent order accepted July 29, 1975).
17. *Borden, Inc.*, FTC Docket No. 8978 (initial decision filed August 8, 1976).
18. *Id.* at 165.
19. See, e.g., *United States* v. *Wallace & Tiernan Co., Inc.*, 1954 Trade Cas. ¶67,828 (D.R.I. 1954); *United States* v. *A. B. Dick Co.*, 1948-49 Trade Cas. ¶62,233 (D. Ohio 1948).
20. See Rushefsky, *FTC Section 5 Powers and the Pfizer-Cyanamid Imbroglio: Where Do We Go From Here, or "You Ain't Seen Nothing Yet,"* 18 Cath. U. L.Rev. 335, 347 (1969).

Research to Realization Via the Campus

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building suit, to negotiate with Random U, you and they will begin with two essential factors clearly established. These are:

1. The University Licensor absolutely requires the cooperation of some company to develop and market the product or service.
2. The Licensee will be risking substantial time and money on a relatively unproven invention.

The type and details of the license bridge that ultimately rests on these principles will vary with the other circumstances. You will want the technology to:

1. Be fairly priced.
2. Be exclusive for as long as possible.
3. Be patented or patentable.
4. Have a high return on overall investment.
5. Have cost as little as possible in case at some future point you change your mind.

The licensor will want the licensee:

1. To insure diligence in his development and marketing efforts.
2. To return rights in the invention if the project is not pursued.
3. To accept a limited term of exclusivity so that he can expand the market if the licensee does not.
4. To pay a royalty which recognizes the licensor's willingness to wait for a return until sales can generate it.

At WARF, we believe that the licensee usually should:

1. Have the right to terminate the agreement on notice.
2. Not be expected to make minimum royalty payments until sales begin, and then on a graduated scale.
3. Invest its capital in the development rather than in large front-end payments.

We expect the licensee to prepare a development schedule or PERT chart to be made a part of the agreement, with periodic reporting by means of which his progress can be monitored. We do not grant life-of-the-patent exclusive licenses.

These are the key supporting girders. The rest of the bridge will be built by carefully listening to the needs and fears of each party and placing only sufficient structure to handle the problems.

There is one other major reason why licensing is uniquely suited to the long-term relationship which must be sustained if a new product is to get to market in this day of intense governmental regulation. That reason is *change*. No one can foresee clearly the outcome of a four-to-eight-year development effort. A license agreement based on a mutual understanding of each party's fundamental importance and desire to maintain the bridge can absorb change and evolve with time to provide a workable relationship between the parties.

SUMMARY

I would summarize the case for acquisition of university research through licensing as follows:

1. By utilizing the university discovery that fits your marketing and production skills, you have conserved your R&D efforts for those more predictable, present product-related goals. You have not had to support the uncertain, long quest for a truly different product, i.e., your costs have been reduced.
2. Through the licensing route, you delay payment for the research until after you have established that the product is both producible and marketable. Your royalty payments will be fixed, known costs, and will be earned for you by your customers.
3. Licensing helps both parties to the arrangement avoid those differences in expectation which could stalemate other means of acquisition.

Remember, most universities have established the means to help you locate their technical advances. In many cases, their experienced licensing officers will already understand many of your concerns and questions. You, as licensing executives, are trained in the use of one of the most flexible and useful contract forms to help you obtain that technology on a fair and equitable basis.

When will you begin?

Interface With Technology Transfer

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and commercial development. He must convince corporate management of the viability and desirability of the project and acquire the necessary internal financing to implement the project.

The information system is monitored by management at Searle through a bimonthly status report which is sent to the executive committee and other interested parties. The status report contains a list of those projects in development, in advanced evaluation, in primary evaluation, and termination. Of approximately every 100 projects entered into the system, 90 are dropped after initial evaluation and 10 are evaluated in greater depth. Of those 10, one will make it into the development stage and be financed. The experience at Searle has been very similar to that shown to be the case in other companies, as far as number surveyed versus number developed.

In conclusion, if one takes care in structuring a company interface group, the problems associated with transfer of technology into the company from external sources, such as universities, are minimized and the benefits and efficiencies are maximized.

NOTES
1. Granville W. Hough, *Technology Difussion*, Lomond Books, 1975, pp. 38-45.
2. "Universities Promote Sale of Technology," *Chemical and Engineering News*, March 12, 1973, p. 29.