Title: Two Perspectives on a Successful Lab/Industry Technology Transfer

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TWO PERSPECTIVES ON A SUCCESSFUL LAB/INDUSTRY TECHNOLOGY TRANSFER

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ABSTRACT

Technology transfer from government laboratories to private business is of increasing concern in today’s marketplace. Some prospective partners (on both sides) believe that technology transfer is a relatively simple process requiring little or no extra effort from the participants. In our experience this is not true and, in fact, positive results from a collaboration are directly proportional to the effort that both parties invest in the relationship. Communication, both between prospective partners before an agreement and between partners following the agreement, is essential. Neither technology nor marketing can stand by itself; it is the combination of the two that can produce a useful and available product. Laboratories and industries often have very different ways of looking at almost everything. Misunderstandings arising from these differences can short-circuit the transfer process or result in the production of a product that is unsalable. We will cover some of our experiences, potential problems, and our solutions.

BACKGROUND

The long-range alpha detection (LRAD) technology and several applications were developed at Los Alamos National Laboratory (LANL) with DOE support over the past four years. This technology, and the five current patents covering applications of continuous LRAD detectors, are the subject of both CRADA and licensing agreements between LANL and Eberline Instrument Corporation. Eberline is currently marketing an object monitor, the LRAD-1, based on the airflow LRAD concept discussed below. Several other LRAD applications are currently under consideration as future commercial products.

TECHNOLOGY

Sensors based on the LRAD concept1,2 detect the ions produced by alpha particles in ambient air rather than the particles themselves. Thus, unlike traditional detection methods, LRAD-based monitors are not limited by the range of alpha particles in air. The lifetime of the ions is dominated by wall collisions so that the ions live longer in larger volumes; in a small pipe the ion lifetime3,4 is > 4 seconds, allowing for a much longer range than the several centimeters typical of an alpha particle. The LRAD-based sensors do not require thin windows, fine wires, or specialized gases so they are rugged, reliable, and portable. Some applications dependent on one or more of these features are discussed in Ref. 5.

The group at LANL has built two broad types of LRAD sensor. An electrostatic detector4 utilizes an electric field to sweep the ions onto a detection plate. The ion current is directly proportional to the amount of contamination located under the detection plate. Electrostatic detectors are best suited for measuring contamination on relatively flat surfaces such as soil,6 concrete, floors, or liquids. In an airflow detection system,4 the ions generated inside an enclosed volume are transported by an air current produced by a fan. The air passes through a charged grid which separates the ions from the ambient air. Again, the current from this grid is proportional to the amount of contamination Airflow detectors are
suited for monitoring complex objects and tools or for contamination that is already inside a closed volume (such as a pipe, duct, or piece of process equipment.

FIRST STEPS

Technology transfer agreements such as CRADA’s work best when they are industry driven. The researchers can (and should) develop a technology to the point at which it is interesting to industry, but trying to “sell” a technology to an industry that doesn’t want it is very difficult. If there is not any interest, more research is probably more useful than a hard sell.

Are the expectations and goals of the researchers and the commercial enterprise compatible? Total agreement between prospective partners is unreasonable to expect, but an understanding of these goals is important. The two partners are driven by very different desires, and each needs to understand where the other is “coming from”.

A concern of the research partner is whether the company can do the job and the company’s concern is whether they can match the proposed product to a real market. These concerns can be combined into the question (asked of both parties) as to whether the company will do the job. If the answer is no, then either the “job” or one partner needs to be redefined. The researchers need to realize that their definition of the “job” may not be commercially viable and the company needs to understand that they may not be the best outlet for every technology.

The desires of the end-users for the technology need to be considered as well as those of the prospective partners. It is possible for the researcher to know more about segments of the market than the prospective partners; in any event, it is advantageous for the researcher to understand the final market and demand to help them transfer technologies that are most appropriate.

Seeking out potential end-users/customers who are willing to take a risk on the new development is essential to the long-term success of any technologically innovative product. Their “real world” problems may not be either understood or easily duplicated by either the researcher or commercial partner. Thus, the experience gained in dealing with these users is a valuable part of the commercialization process both before and after signing an agreement.

CONTINUING DIALOG

Continued communication between partners is important for continued growth of the partnership. It is very easy to “each do your own thing” without any effort to know or understand the other partner. It is important to understand what the other partner’s intentions are; not just to hear the words they’re speaking. In particular, researchers are often surprised at the length of time it takes to develop a new product or marketplace. Most conflicts arise from misunderstanding intentions and goals rather than intentional discord.

The common goals of both partners should be recognized and strengthened. In any partnership there are inevitable disagreements and conflicts. There are common interests between the CRADA partners (since both parties agreed to work together); emphasizing these rather than the inevitable differences makes for a productive working arrangement. We don’t mean to say that there should not be differences in outlook, but that it is often more profitable to work on the areas of agreement than the areas of disagreement.
Laboratory researchers and commercial enterprises each have access to information sources that are unavailable to the other. Utilizing these resources jointly gives the partnership access to users and distribution channels that would not have been available to either one individually. We have derived significant benefits from this identification of mutual points of support.

It continues to be important for both parties to communicate with potential end users. For many emerging technologies, these initial customers investing considerable time and expense in an unproven technology. In a very real sense, these customers are a “hidden” third partner in the agreement. The customer relationship need not be a purely sales relationship (although sales can and should take place), but rather a two-way discussion so that the developed product(s) match a true (rather than perceived) customer need. Although this is often perceived as a commercial partner responsibility, continuing knowledge of the end uses for a technology can be very important for direction of research efforts.

MARKET REALITIES

Introducing a new technology to the marketplace can take longer than anticipated. Actual demonstrations are often required to shown that the technology performs as advertised. This sluggishness in acceptance can make successful transfer slower than anticipated. The researchers and commercial partners can effectively display the technologies capabilities in scientific conferences and sales demonstrations respectively.

The challenge of introducing a new technology is compounded if the appropriate market is in its infancy and also requires development. Many diverse technologies will be attempting to acquire a piece of this developing market. The fact that a technology is “new” and “innovative” does not instantly guarantee commercial success. In a developing market, the partners need to identify not only traditional competitors and competitive technologies, but other expanding innovative solutions. Effectively dealing with this infant market, and the many new technologies it creates, requires an even closer collaboration between the partners.

Some technologies (such as the LRAD) lend themselves to multiple, diverse, applications. Although this may look like an ideal transfer opportunity, it can lead to a number of potential strains between the partners. Researchers, eager to develop many applications, may not understand the inevitable time lag between product development and commercial sales. On the other hand, the commercial partner may not be aware of opportunities outside of their traditional markets. Good communication between partners is also very important in a multiple application/market situation.

COMMON MISCONCEPTIONS

The newfound desire to “commercialize” technologies has led to a number of misconceptions about the process. We have included four of the most common ones and some comments on each.

“Technology transfer agreements are simple”

Two common sentiments that are quite appropriate to this issue are “nothing worth doing is simple” and “you get what you pay for”. If your goal is to produce an agreement quickly, it can certainly be done, but this agreement may not have been carefully thought out by both parties. Time spent in understanding the issues before an agreement is signed is well rewarded by saving (a much larger amount of) time trying to negotiate conflicts in a working relationship.
"The CRADA is a final goal"

A CRADA or other document may be legally necessary to proceed with a partnership but its existence should not be perceived as a goal in itself. The goals are (for the researcher) continued funding and development of an idea and (for the commercial partner) sales of devices resulting from the partnership and market acceptance of these devices. Without these final sales, documents do not accurately reflect the success of the commercialization effort.

"We don't have to communicate after the CRADA"

It is often all too easy to create an “iron curtain” between ostensible partners after an agreement is signed. A common feeling among researchers is that once a CRADA is signed, all their problems are over. Similarly, the industrial partner often feels that once they receive a basic idea, all exchange should be over. In our experience, neither of these is true - both parties can continue to assist the other in future development. The same characteristics that caused both parties to agree in the first place can and should be used for further benefit to the partnership.

"A CRADA is a funding source"

Often, a technology transfer agreement or CRADA is viewed as a funding source for an otherwise unfunded development project. Why should a researcher expect commercial support for a project that no other users or funding agencies want enough to fund? A technology that can generate interest and funding on its own can do even better with the prospect of commercial involvement but a technology that users don’t want is going to be very difficult to commercialize.

CONCLUSIONS

All of our previous discussion can be summarized by the word communication. Often the researcher, the commercial entity, and the prospective end user are all talking at each other but not to each other. The goal of partnership agreements (for all three of the interested parties mentioned above) is successful production, distribution, and use of a product. This can only happen if each of the parties understands the needs and requirements of the others.

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REFERENCES


