Successful University Licensing: Blending The Academic And Entrepreneurial Cultures

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Creating a technology licensing program and establishing its activities within the academic research culture are a challenging undertaking. For those just beginning a program in technology transfer at an academic research center, introducing the obvious business and entrepreneurial objectives of the program may be the most difficult of any of its subsequent responsibilities. This article is intended to identify some of the important cultural barriers that may be encountered in setting an academic technology transfer office in place and hopefully will provide some helpful suggestions for overcoming these barriers and achieving a successful and productive academic technology licensing program.

Introduction

Perhaps the thought that comes to mind when one thinks of the traditional academic and industry research cultures is the grade school experiment that introduces students to the principles of magnetism. This simple principle states that like poles of a magnet repel each other. The "likeness" or similarities of academic and industry research stem from the fact that both cultures thrive on the discovery of new technology. Both have experienced leadership and well-trained professional staff utilizing the most modern research technologies and time-tested scientific principles in their experimental protocols.

However, unlike the simple magnet experiment of grade school science, it is the differences that cause these cultures to naturally "repel" each other. Clearly, the mission of academia is the creation and dissemination of knowledge and the education of the next generation. Industry, on the other hand, must stay focused on increasing shareholder value. In the laboratory setting, academic research is typically curiosity-driven basic research. Priorities are set by the principal investigator and discoveries are often serendipitous with an eye towards publications, the acquisition of grants and the furtherance of one's career. In contrast, the research priorities in industry laboratories are usually set by management and discoveries are controlled (at least to the greater extent) with research results being confidential and proprietary and directed towards products, profits and enhanced company growth. Thus, these very basic objectives create cultures which have very different endpoints and missions.

Recent Success

Notwithstanding these cultural differences, licensing of technology from academic research institutes to private industry has helped drive economic growth in the United States.[1] However, the growth of university to industry technology transfer has raised some interesting questions in the minds of both academics and industry researchers and management. For example, academic researchers may well ask, "why partner with industry?" A close look at some of the answers to this question may be quite revealing and attractive to the academic researchers. For one, they may find a realistic application of their research to the public benefit. Exposure of academic researchers to industry investigators my bring rewarding scientific collaborations, additional sources of research support and may result in added revenues to the academic research endowment. In support of the former advantage, a recent study revealed that university-industry collaborative papers are more often cited than single university publications.[2] In support of this latter advantage, a brief look at the most recent Association of University Technology Managers (AUTM) survey results indicates that in fiscal year 1999, industry sponsored research to universities totalled $2.7 billion and licensing revenues reached $862 million. These represent rewards that perhaps are not initially realized by academic researchers or their institutions.

Recently, industry has been pouring vast sums into research and

1. Rogers, E.M., Yin, J. and Hoffman, J. (2000). Assessing the Effectiveness of Technology Transfer Offices at U.S. Research Universities. J. Assoc. Univ. Tech. Mgrs., XII: 47-80.

2. Hicks, D. and Hamilton, K. Does University-Industry Collaboration Adversely Affect University Research? Issues in Science and Technology, Summer, 1999.

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development. According to a recent *New York Times* article, between 1994 and 1999, American industrial R&D grew from $97.1 billion to $166 billion. This is more than double the spending of the federal government which in 1999 was about $70 billion. Surprisingly, the segment that grew the fastest was basic research, up 79% to $10.9 billion.[3] Although industry-sponsored research is still relatively small compared to the federal government expenditures, representing about 10% of the total, it is nonetheless significant and growing. The Industrial Research Institute predicts industry-sponsored research will double over the next ten years.[4] Thus, it is an important source of research funding that should not be overlooked.

Likewise, industry may ask, "why partner with academics?" Again, thoughtful consideration would reveal that academic laboratories are a rich source of new technology, many, if not most of which, can be applied to or become the basis of new products. Also, given the resources required to build and to support research infrastructure, industry may actually find it less expensive to support academic research laboratories and to license-in technologies. Certainly, and for the most part, the biotech industry was built and continually relies on academic laboratories for their early stage technologies as a base for potential products.

Once again, the AUTM survey results from fiscal year 1999 support these conclusions. Academic research centers received over 12,000 new invention disclosures from their faculty and filed 5,545 new U.S. patent applications. In addition, there were 8,308 licenses/options executed, 3,661 U.S. patents issued and 344 new companies formed. Clearly, these data support the notion of academic research laboratories as a "mother lode" of new ideas and technologies from which new start-up companies and novel products can be realized.

It is generally agreed that the Bayh-Dole Act of 1980 was the impetus for the formal introduction of the technology transfer process into academic life. Without an exhaustive review of the Bayh-Dole Act, its major thrust is to allow universities and small businesses to retain title to inventions discovered or created from research supported, in whole or in part, by federal funds. In addition, the Act allowed the granting of term-of-patent licenses to these technologies. Most importantly, the Bayh-Dole Act specifically promotes and upholds the principle that the American public has a right to benefit from the research it supports. Thus, the technology transfer process received a formal "blessing" from federal government resulting in academic centers, the private sector and the general public having benefited significantly over the last 10-15 years.

Critical Success Factors

Therefore, with the obvious intellectual and financial advantages to both parties (supported by the AUTM FY 1999 survey data) and the recognition by the federal government that academic research should be part of the product development process, how are the entrepreneurial and academic cultures blended by and within an academic technology licensing program? It is the authors' opinion that while many factors are required to blend these cultures, there are three of particular importance: the institution's policy on intellectual property, the revenue sharing policy and faculty/staff involvement in the technology transfer process.

The common objectives of colleges and universities are education, research and public service.[5] However, it is of paramount importance that any institution involved in or contemplating a technology transfer program establish a policy on intellectual property. This policy should clearly and succinctly delineate that the academic institution owns the rights to any intellectual property conceived and/or reduced to practice by its employees. This is particularly true where employees are full-time and salary support, supplies, office and lab space and other resources of the institution are utilized in the research. This is also applicable where grant monies, awarded to an institution on behalf of a researcher, are administered by the institution. The policy should apply to faculty, administrators, technicians and all other employees of the academic research institute. While post doctoral fellows and graduate students are included, there is still an unanswered question among licensing professionals as to whether undergraduate students and volunteers should be subject to the policy.

The policy on intellectual property should not only define ownership but should also include statements on transfer of ownership, rights and obligations of the employer and employees, royalty sharing (discussed in more detail below) and procedures for waiver of the policy. In developing such a policy, it is helpful to look at existing policies from several institutions of relatively similar size and mission. Likewise, constant feedback from faculty and staff, administrators and other groups covered by the policy is essential. This will necessarily involve many drafts, many presentations and several open forums for discussion. These are all time consuming but, in the long run, positive experiences for the beginning office. The final obvious step is getting approval of the top administrators and the Board of Directors. If due diligence is exercised, swift approval at this final level is the likely outcome.

The second important driver of blending these cultures is the royalty or revenue sharing structure that is usually contained within the intellectual property policy. An equitable policy is based on all revenues received from a license minus

3. Broad, W., U.S. Back on Top in Industry Research. New York Times, December 28, 1999.

4. Industrial Research Institute. Industrial Research and Development Facts. Washington,

5. Ku, Katherine (1999). University Licensing and Technology Transfer. The Licensing Journal, 19(5): 13-16.

legal, patent and other expenses associated with the license, such as market and/or patentability searches, consultants, and expenses incurred by the technology transfer office during license negotiations, to name a few. A distribution policy based on cumulative net revenues will be the initial positive step towards approval at all levels.

How net revenues are distributed is often times a contentious issue. However, gathering comparative information from policies of other institutions of similar size and mission is again a recommended beginning. Although wide variation may exist, typically, net revenue shares go to the inventor(s), the department or division in which the inventor is a member and the institution. In these times of increased faculty mobility, a contingent statement is recommended for the inventor's share in the event an inventor leaves the institution.

The third, and perhaps most integral component of a successful technology transfer program is faculty and staff involvement. Involving faculty and staff from the outset accomplishes two extremely important objectives: education and compliance. Most faculty and staff are unaware and inexperienced in the processes and procedures commonly utilized in licensing technology, establishing confidentiality, securing corporate-sponsored research support and finalizing transfer of research materials. Involving faculty and staff will make them aware and knowledgeable as to how and why certain procedures and documents are necessary. Likewise, if the expectation and desired outcome is compliance with new procedures and practices introduced by this "culture shift," faculty and staff need to "buy in" to the technology transfer program. In other words, a successful program in technology transfer is a consensual program.

Achieving these objectives begins very early with faculty and staff involvement in the form of feedback during the preparation and or modification of the policy on intellectual property addressed earlier. Also, maintaining visibility, attending faculty seminars, and overall demonstrating a true interest in their research programs tends to break down many of the initial barriers to compliance. Faculty and staff will need to identify what's in it for them, so count on protracted periods of reluctance, skepticism and rebuke by some if not many. There will be some from whom you will never hear and/or convince that your program is fair, equitable and necessary. It is recommended that you discuss these cases with your lead administrator.

One very positive step is for the university's various administrative offices to take a more team approach to promoting collaborations with industry. These offices can take a more proactive approach to marketing their research strengths to corporate America. In addition, the university could help motivate faculty involvement by modifying their performance metrics to include university-wide recognition for participation in industry-university collaborations. Specifically, universities can begin to include entrepreneurial activities in the criteria for reappointment, promotion and tenure. One such program has recently instituted this concept[6] and it is expected to realize a marked increase in invention disclosure submissions and licensing activity. On the faculty side, some keys to a successful collaboration with industry include a willingness on the part of faculty to tie their university research timeliness to the company schedule and to incorporate projects that fit with the company's research agenda.[7]

Conclusion

Perhaps the most formidable challenge to establishing an office of technology transfer is introducing into the academic research environment those aspects of the business and entrepreneurial culture necessary for a successful technology licensing program. While at first glance, the essential elements of these cultures would suggests an improbable outcome, current data and trends in university-industry transactions present a very positive picture of success. Understanding of the academic culture, involvement in the day-to-day research environment, a fair and equitable intellectual property policy, administrative support and faculty/staff involvement are key elements in creating and maintaining a successful academic research-based technology licensing program.

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6. University of Cincinnati Department of Biomedical Engineering, 2000.

7. Business - Higher Education Forum. Working Together, Creating Knowledge: The University-Industry Research Collaboration Initiative (viewable at: www.acenet.edu/bookstore).