



The University Innovation to Commercialization Process

The process of creating and transitioning the great storehouse of university research and development to commercial products is by its nature a true partnership of great university innovators and experienced entrepreneurs. V2R's team has a sophisticated approach and a high level of relevant experience providing noteworthy competitive advantages in each stage of the University Innovation to Commercialization Process.

University Innovation, Research, and Development

Within the United States, the entire process of university innovation to commercialization begins deep in university laboratories where faculty, graduate students, and post-doctoral researchers engage in more than \$45 billion of cutting edge research and development annually¹. Not all universities engage in significant research. Many smaller universities focus primarily on undergraduate education while major research universities in the US have a three-fold mission; research, education, and service. Within these major research universities, the faculty are expected to contribute to all aspects of this mission with a traditional emphasis placed on research and education. Faculty research programs are very much self-selected and self-directed by faculty who recruit graduate students (Master and Ph.D.) and post-doctoral researchers to fill out their individual research teams and advance the state-of-science in their chosen field. Faculty are rewarded for their accomplishments in their research field with tenure (essentially lifetime employment) and with progression through the ranks of assistant, associate, and full professor, with accompanying pay and recognition increases. The scientific community's endorsement of the quality of the research is provided through peer review of publications in leading journals and through attainment of leadership positions in the faculty member's relevant societies.

It's important to understand that over 70% of university research is categorized as 'basic' (research for the sake of knowledge) vs. applied development (research for the sake of meeting a specific market need through development of a product or service). As a comparison, typically less than 10% of corporate research is categorized as basic². Basic research provides the foundation for fundamental technology breakthroughs for next generation corporate products, establishing a key role for US universities in the overall advance of technology today and in

¹ NSF Science and Engineering Indicators 2008

² Ibid



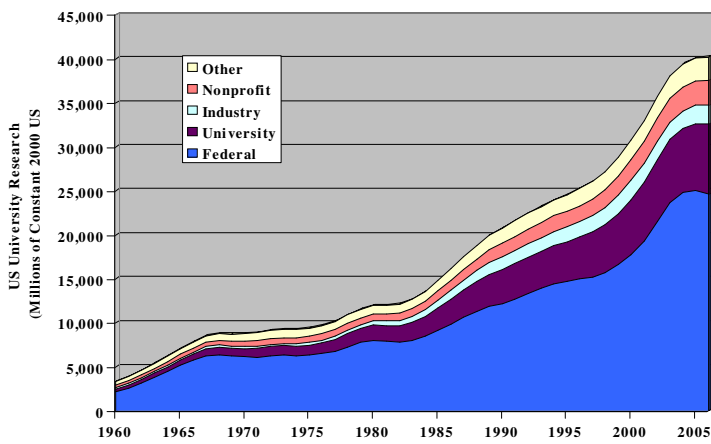


the future. Often, basic research is years from market readiness. This gap in technology development renders V2R's process for evaluating commercial potential critical to selecting those research programs that will produce true commercial products that fit V2R's risk mitigation strategy.

A typical faculty member's team might undertake anywhere from hundreds of thousands to millions of dollars in funded research annually with over 60% of funding coming from federal agencies with the remainder being supplied by private sector companies (5-15%), foundations, state resources, and other organizations. It's important to note that at any given time a research team will typically be working on several synergistic research projects in their field funded by multiple sources.

Regardless of the funding source, the research is initiated by a formal Sponsored Research Agreement which dictates the project's scope, budget, terms and conditions.

Growth and Support of US University Research Funding



Source: NSF Science and Engineering Indicators; 2008

V2R enjoys significant advantages in this stage of development. With senior management's extensive personal contacts with faculty and their respective departments, V2R has the opportunity to develop formal relationships with the university when it's timely to key advances in important research and development projects. This advantage is broadened by our participation in the Florida Research Consortium, which was established by the Florida legislature to facilitate technology commercialization in the state of Florida. We combine these relationships with decades of experience studying and evaluating key research programs in Florida to establish a premier position with universities, thereby providing access to first-class technologies while not tying V2R to early stage research funding.





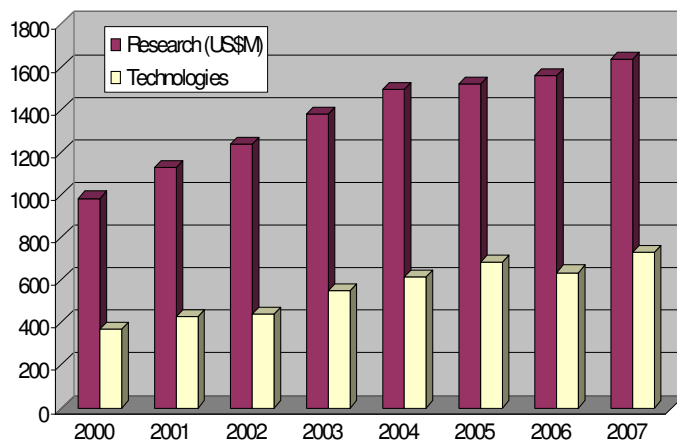
University Research Translates to Invention

One of the key differentiators between research contracts funded by the public sector (federal agencies such as National Institutes of Health, National Science Foundation, Department of Defense, National Aeronautics and Space Administration, Department of Homeland Security, etc.) and the private sector (corporate) involves treatment of intellectual property that might result from the research project. Under the Bayh-Dole Act of 1980, a federal funding agency will generally contribute the rights to intellectual property (patents, copyrights, trademarks, trade secrets, etc.) from projects that the agency funds to the university. Faculty and graduate students that are funded by the university have already agreed to assign intellectual property developed under funded projects to the university in their employment agreements. The university is then free to engage in technology marketing and licensing as they see fit. This provides V2R with a single point of contact as well as a tremendous storehouse of technologies that have been developed by leading research teams through millions of dollars of federal funding.

The “standard” university template for research funded by corporate sponsors provides the sponsor with a limited-time first option to negotiate the license of corresponding inventions that are produced by

the university research team. Corporate sponsors will routinely utilize the fundamental information developed in the project for use in existing corporate products and processes rather than license a specific invention, unless a license is required to accelerate a key corporate goal or to block a competitor. Also, many corporate sponsored technologies have market applications that are outside the scope of the sponsor’s business, providing a secondary inventory of technologies that V2R can access.

Research Translates to Inventions in Florida Universities



Source: Florida Research Consortium; 2007





V2R's proprietary approach to evaluating and acquiring technology was created over a decade of direct university technology transfer experience to fully exploit best practices in commercializing government and corporate funded university technologies. Utilizing V2R's approach to assessing the commercial potential of a university technology, we have efficiently evaluated hundreds of technologies in various universities. We have leveraged our internal process to garner respect and trust from top-level contacts at large Florida research universities, leading to the establishment of strong relationships for technology assessment and acquisition. Furthermore, the V2R Executive Team has been working with senior research directors in leading corporations throughout Florida and the US for over a decade in university / industry collaborations and technology transfer, providing valuable contacts with corporate technology development funding sources that V2R can leverage.

University Manages Intellectual Property

As part of the aforementioned Sponsored Research Agreement and employment agreements, university researchers are required to disclose inventions and technologies to the university for intellectual property management and commercialization. Multi-year statistical analysis of university technology commercialization by the industry's leading association, the Association of University Technology Managers³, indicates that inventions are produced at a rate of approximately one invention per \$2.5M of research funding annually. This productivity rate is essentially consistent across major research universities, especially those with a substantial College of Engineering and College of Medicine which produce the majority of university technologies for commercialization.

After a university Technology Transfer Office, sometimes called a Licensing Office, receives an invention disclosure, interviews the inventors, discusses the technology with the industry sponsor as appropriate, and completes very high level and preliminary patentability and market research, the office makes one of three decisions:

1. The university will take ownership of the technology with agreement to pursue licensing (generally 50% or more of cases). In this circumstance, the university will seek appropriate patent, copyright, and trademark protection and attempt to market the technology to appropriate commercialization partners through a license. Generally speaking, 10-20% of licenses will be awarded

³ www.autm.net - AUTM annual licensing surveys





- to early-stage and start-up companies, including faculty run spin-off companies.
2. The university will decide that the invention does not have enough commercial potential for any number of reasons such as patentability, market potential, and competitive products and will decline its interest in the technology (generally less than 40% of cases). Under these circumstances, the intellectual property rights revert to the federal funding agency if one is involved in funding and the inventor can petition that agency for commercialization rights, which will typically be granted.
 3. The university will decide that the invention is not ready for commercialization and opt for further development (generally less than 20% of cases).

If a technology is selected for commercialization, it will then be processed through appropriate US patent, copyright, and trademark applications. If the technology's market potential justifies the ultimate cost of foreign patent protection, the university may apply for foreign patent coverage, typically pursued through Patent Cooperation Treaty application.

V2R's Executive Team includes years of experience sitting directly on university technology evaluation committees, providing V2R with clarity as to the mindset of university technology transfer offices in their commercialization decisions. As a result, V2R has been successful in establishing multiple blanket confidentiality agreements, providing consultation to university gap funding evaluation programs, garnering support from influential technology transfer officers, and instituting a prosperous and lasting dialogue with key technology transfer offices.

University Transfer Technology to the Private Sector

Once a university has decided to proceed with commercialization of an invention or technology, a process ensues to build an attractive commercialization package. This process may include intellectual property protection as described above, drafting an initial business opportunity outline, or drafting marketing materials. Many university technology transfer offices have very limited resources (1-2 people) to accomplish all of this, and therefore many great technologies are backlogged within office files. General business development strategies are often times ineffective in engaging a national audience of technology commercialization partners as the process of fully engaging with universities in research and technology transfer involves a clash of cultures and motivational factors that often stymie successfully





transferring technologies to the private sector. Key individuals at V2R have significant experience in both the university and entrepreneurial world and use this experience to bridge the cultural gap.

University technology licensing to start-up companies is a growing phenomenon in the US, albeit on an ad-hoc basis by individual entrepreneurs. 500-600 new university spin-off companies are being formed annually and university based start-ups have historically had a relatively high track record of survival. Universities are benefiting from spin-off company successes as they typically take a royalty stream of 2-10% of gross sales and an equity stake in 70% of start-ups, which may typical range from 2-15%.⁴

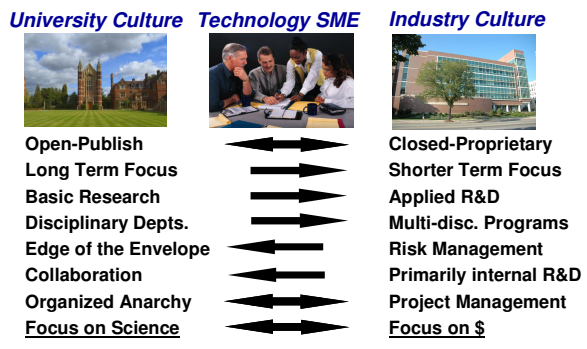
In reality, many university spin-off companies never recognize their full potential due to the management team's inexperience in fully utilizing university resources such as researchers and infrastructure to create maximum value and shareholder wealth.

Virtually no university technologies are market-ready when they are licensed from a university. Rather, university technologies almost always require some level of follow-on development. A university technology

license is only one piece in the puzzle of maximizing the consistent chances of successful technology commercialization. Engaging university researchers to provide further development is tricky and fraught with pitfalls. The process involves managing potential faculty conflicts with additional outside activities. Furthermore, the license should be structured to allow maximum flexibility to access the results of follow-on research such as derivative works.

V2R's Executive Team has a decade of direct experience in university technology commercialization from the key perspectives of 1) universities, 2) university start-up companies, and 3) university spin-off investment groups. This synergistic combination of experiences provides a significant competitive advantage to V2R. Our intimate knowledge of

Culture Clash Stymies Technology Transfer



⁴ Ibid



these multiple environments serves to affect a successful track record with universities. V2R has designed a unique technology license template, providing a highly negotiated basis to receive significant use of university resources and exclusive rights to further product development.

Conclusion

The process of creating and transitioning the great storehouse of university research to commercial products can be a complex path wherein university researchers, administrators, companies, entrepreneurs, and investors all play a key role. The cultural divide that exists between the private and academic sectors often makes this a rocky path, but one in which experience and an appreciation for the strengths and assets of each group can be invaluable. V2R's team has a sophisticated approach and a high level of relevant experience providing advantages in each stage of the University Innovation to Commercialization Process.

About the Author

Erik Sander, President of V2R Group, is an entrepreneur and technology pioneer with more than 20 years of experience in all facets of technology development and commercialization. Leveraging his experience in leading university and federal laboratory technology development and commercialization programs, Sander has driven projects and companies to success through a combination of technology and business expertise. You can reach him at es@v2r.com. Information on V2R Group can be found at www.v2r.com.

