

## Commercializing University Research: Gift and Opportunity

By Meg Wilson

*Abstract: Commercializing university research is a tough process. Universities are hard to work with, operating under a totally different culture from the market economy they are being asked to be more a part of. There are approaches that can be taken which take this cultural difference into account, which have the potential to help accelerate the success of university commercialization processes.*

It should be easy and straightforward to commercialize results from university research. It is not.

It is not, because of the vastly different cultures involved; because of the historical processes, which have stood universities in good stead for centuries but which are not well adapted to a flat world operating at digital speed; and because of the increasing external pressures on the university to *be* more to more people.

US Universities have been operating under the Bayh-Dole law for 25 years and are progressing steadily in the rate of research commercialization and in the sophistication of that process. The Bayh-Dole law's policy and objective is "to promote collaboration between commercial concerns and ... universities; to ensure that inventions made by [universities] ... are used in a manner to promote free competition and enterprise without unduly encumbering future research and discovery; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor". Bayh-Dole allows universities to own the intellectual property (IP) rights from federally funded research and to license that IP for commercial benefit. It requires universities to report to the Federal research funding agency "the utilization or efforts at obtaining utilization..." It requires a sharing of royalties between the university and the inventor (usually a faculty member, and sometimes a student or research staffer) and also requires that net royalties be used "for the support of scientific research or education".<sup>i</sup>

For the past 25 years, colleges and universities across the country have responded to Bayh-Dole and the increasing amounts of research funding by creating a variety of research commercialization structures. The most common is a university licensing office or an office of technology commercialization (OTC). These offices range from one to dozens of people depending on the institution's research budget, commitment to research commercialization, and surrounding university and community support structures. The average-sized office has 4-5 people, composed mostly of lawyers and marketing experts. Many smaller institutions with very limited research efforts have no OTC: when they develop a licensable innovation, they punt.

You may ask at this point what the problem is. There are several responses to that question which range from a concern that these commercialization efforts are perverting the university mission, to endemic problems of bureauviscosity<sup>ii</sup> affecting OTCs, to the law of unintended consequences which drives OTC preferences for large company licenses over startup and small-company-based licensing deals.

## Culture

People who work at universities are attracted to the institution because of its mission, the intellectual stimulation, freedom (universities have been described as anarchies or collections of entrepreneurs or consultants, since each faculty member is mostly in charge of his or her own work), and a desire to give back to society. The mantra of the academic world is that universities are all about education, research and service. All activity must fit into one of those categories.

Universities operate under a gift economy. "...Academicians are supposed to write (and research) for honor, and the academic system of exchange is supposed to be based on the reciprocal and personalized exchange of gifts rather than the impersonal selling of private property."<sup>iii</sup>

Another paradigm for understanding this cultural divide is provided by Jane Jacobs in *Systems of Survival* where she lays out, through a dialog, the moral foundations of public life. She posits that there are those who operate under a guardian syndrome and those who operate under a commercial syndrome, and they are fundamentally different moral value structures. A subset of maxims of those operating under the guardian syndrome includes: shun trading; exert prowess; adhere to tradition; respect hierarchy; dispense largess; treasure honor.<sup>iv</sup> These closely parallel the gift economy concepts.

In *Managing the Partnership Between Higher Education and Industry*, the authors lay out the stakes. "Although a climate of optimism prevails, growing collaboration between higher education and industry has raised important questions about its long-term effect and, some would say, its propriety. The primary functions of a university and a corporation are indeed different. Although the development of new ideas and their practical application can frequently be complementary, (then) Yale University President A. Bartlett Giamatti cautions that this 'simply throws into relief the basic differences between universities and industries: the academic imperative to seek knowledge objectively and to share it openly and freely; and the industrial imperative to garner a profit; which creates the incentive to treat knowledge as private property'." They go on to say "Rapid changes in science and technology, however, are teaching higher education and industry that osmosis is no longer an efficient way to seek wisdom, much less wealth. In an information society, education is a strategic resource for business and industry, and knowledge the essential product. Thus interdependent, colleges and universities are entering into partnerships with corporations that will enable both to shape and secure their futures."<sup>v</sup>

The economy of the gift culture or guardian syndrome is juxtaposed against the market economy or commercial syndrome and it is where they meet head-on that tensions ensue. They meet most directly in the task of commercializing university research. It is thus imperative that those in each culture understand the other's culture. Rather than viewing OTCs as the enemy, faculty should view those offices as allies. At the same time, the OTCs need to understand that many faculty members are not comfortable thinking about

their research being used to make private profits. When effective translation is occurring, it is possible for research commercialization to progress more readily, with optimal results.

Dr. Mary Sue Coleman, President of the University of Michigan, and a biochemist, said, "It is not about the money... Technology transfer must serve our core mission: sharing ideas and innovations in the service of society's well-being." When companies understand this perspective and look for the win-win for the university and the company, deal making is easier and faster. Universities must understand this to propose realistic terms that account for real business risk, and to identify the best path to market regardless of the university's preference for instant gratification through paid up royalties.

### The R&D Enterprise

Increasingly, universities are doing the basic research of the world. Corporate basic R&D is a vestigial function. Most corporate R&D is downstream development or is outsourced to smaller companies, research institutes or universities. The Synergy table

	Basic research	Applied research	Development
Academic R&D	74.1	22.2	3.7
Industrial R&D	5.9	19.6	74.5

There is a co-dependency here...!

highlights the factors driving more companies to look to universities for access to basic and applied research. Universities need companies because, at least in the US, prototyping and certain kinds of testing are very difficult to do at a university. For research results to be integrated into products and processes, it must get into the hands of the private sector.

For this reason alone, we should want the commercialization process to work better than it does.

But there is another compelling reason for the process to work better: open innovation. The way the world innovates in 2006 is through partnerships, collaborations, cross-pollination, cross-licensing, joint ventures and short-term task groups. For universities to stay abreast of the state-of-the-art science and engineering, they must also operate on the same footing: openness, receptivity to new ideas, cooperative partnerships: these are the hallmarks of academia anyway, so it should be relatively easy for universities to accept the concepts of open innovation and understand that the knowledge transfer may be a two-way street.<sup>vi</sup>

### Small business Access to Universities

Traditionally, universities have worked with large companies. Large firms often become university department affiliates, fund research directly or through organizations such as the Semiconductor Research Corporation and track research results on a routine basis. Large companies have people who are adept at working with universities and understand the culture and the players.

Not so with small companies. Mostly, small companies don't have the resources to fund university research nor the time or money to pay someone to track university research and bridge to those universities conducting research pertinent to the small company. If they do have a relationship with a university, they often don't get the same treatment as larger companies. To an OTC, a small company is often viewed as a poor risk, hard to work with, and not worth the trouble, since they don't have lots of up front cash to pay for technology licenses and want special deals that fit their profile.

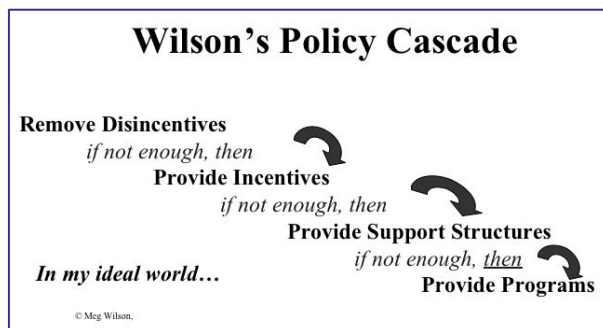
University OTCs with a strong marketing bent are much more attuned to the value of working with small companies. They recognize that the flexibility and commitment of small companies make them ideal for certain kinds of commercialization deals. These OTCs also have a higher tolerance for risk, which allows them to consider a broader range of commercialization paths, including equity-based deals, and which increases their chance of choosing the best development path for a technology.

Most OTCs are self-funded: they pay for their operations through royalties and fees from licensing agreements. They can reap the benefits of the sale of equity, but such sales are not certain and often several years away. For an OTC director who has to make payroll every month, equity deals carry too much uncertainty for the amount of work they take to get done. And yet, we know that entrepreneurial ventures are often the best ways to launch an innovative business, with good growth potential. There must be a better way...

Launching a university technology through a startup is particularly daunting. The Startup needs capital, technical expertise, business planning savvy, good access to markets, etc. The fact that Texas now has the Emerging Technology Fund is a tremendous benefit to startups and small companies who endeavor to reach new markets with new technologies. If the universities become easier to work with, the combination of good entrepreneurial talent, good research and early-stage capital will greatly benefit the State.

### Strategies to Improve University Research Commercialization

Any time policy changes are called for, the premise for the change should be explicit. Is



there a market gap that government should try to fill until the market can correct itself? Is there a problem with an easy solution? In 1980, when I was doing long-range planning in the Governor's Office, I developed this cascade as a way of identifying the most effective, least intrusive way of solving a problem. Lets apply it to the challenge of making our university

commercialization process more effective.

**Remove Disincentives:** Texas A&M Regents took one of the boldest, and yet easiest and most effective steps to increase the flow of commercializable research by changing the tenure policy to allow faculty to get credit toward tenure from research commercialization activities. The lack of tenure credit was a serious disincentive to young faculty who wanted to file patents and follow through on research they were conducting, possibly participate in a STTR research grant, etc. They could not afford to take the time away from writing peer-reviewed academic papers when that was their only path to tenure. Doing otherwise could delay or derail tenure. Removing this disincentive allows faculty to do more to move their research into commercial use. Any faculty member who is uncomfortable with this flexibility can stick with the pure publish or perish tradition. It allows those faculty members who are more comfortable with the commercial syndrome to take a step in that direction.

An extension of the faculty tenure idea is that of the revolving door. There are faculty members who are multiculturalists: they can operate in a gift economy and a market economy. It should be easy for these faculty members to help take their research results out into the commercial world for a year or two and then come back to the university when the venture is well launched, refreshed, with vital new information to use in the classroom and lab. This can happen now, but it is more the exception than the rule. A revolving door policy can have a benefit to recruitment, especially for the brightest, young faculty who want an opportunity to conduct research but also to implement their research. It is a question many new PhDs ask during recruitment discussions. Those universities with good multicultural policies will be the winners.

OTCs have a disincentive to work on equity-based deals. If there was a way for them to be compensated for working on such agreements, the decision process would be better, allowing the OTC to concentrate on the best path to commercialization rather than the most lucrative short-term path. Alternatives could include direct funding of OTCs by universities, direct appropriations or through TETF grants, to supplement or supplant royalty and fee revenue. Whatever strategies are adopted, OTCs need to be buffered from those in the State who “don’t get it”, and push only for fast turn-around and short-term wins. Generating revenues from university research is a long, hard, expensive, risky road.

**Provide Incentives:** An alternative to the current funding structure of OTC’s could take advantage of the same kind of incentives that drive the commercial world. Why not allow OTC staff to get a portion of equity deals, as faculty and universities can do presently? Other incentive-based alternatives could include funding the OTC staff at a base level and letting them earn equity or commissions to supplement their base pay. Those with a higher risk tolerance could concentrate on the equity option, and those wanting a more certain base could concentrate on straight licensing deals.

Also, Venture firms could provide finder’s fees to OTCs that match university research to the needs of their portfolio companies: a win-win since the VC-backed companies might provide a lucrative path for commercializing the research. Communities could do something similar, supporting OTCs to alert them to technologies that fit companies in

the community. This approach would build a communication process that could link to cluster initiatives, technology strategies, and community economic development targets.

Universities could create a Moot Corp-type system dedicated to student groups that develop commercialization plans for university technologies. It would provide an incentive for the business, science and engineering students to get involved with OTCs in a productive, targeted way, and do some of the OTCs work for credit.

**Provide Support Structures:** Given the cultural divide between universities and the commercial world, one tactic to allay this problem is for universities to hire advocates who work at the faculty level, helping researchers understand the basics of the process of commercialization: what is a Non-disclosure agreement (NDA)? When does a patent have to be filed? What are the disclosure rules leading up to that point? How does the university patent committee work? When should the OTC be alerted to research results? If there were someone who could hand-hold, coach, reassure, translate, run interference, it would make a huge difference to busy faculty who don't want to know much about the commercial process and it could make the work of the OTC much more efficient.<sup>vii</sup>

As part of the Cluster Initiative, a team could be created for each cluster, to act as an advisor and referral resource for OTCs, so the OTCs could have a better link to the specific technology needs of the Clusters.

Another support structure would be a matchmaking database: university research projects profiled, OTC licensable technologies listed; support companies listed (legal, accounting, technology valuation, business planning; capital sources, including experts at SBIR/STTR grant writing, etc.); companies interested in working with universities to transfer university knowledge and technology. Such a database could link to the Asset database that is being developed as part of the Cluster Initiative and could link into the Technology Strategy Mapping System that Evans and Sekora describe.

**Programs:** If the disincentives were removed, incentives added and support structures put in place, there shouldn't be any need for a new, full blown program to address university commercialization. However, until better process are in place and shown to work, it is possible that the State could undertake some direct programmatic steps to make the process work better. A modest pool of money could be reserved out of ARP funding (Advanced Research Program) to help "pay for" the licensing of ARP funded research. Companies that fund university research could be charged a "processing fee" that would be used to process any licenses developed from that research: those funds would be applied to the OTCs budget. The Legislature could direct the TETF to fund OTCs on some equitable basis for doing equity-based deals.

OTCs could be authorized to set up supplemental farm teams that would be composed of entrepreneurs who would work for OTCs in return for the opportunity to cherry-pick deals and take technologies out through startups. This approach has conflict of interest challenges, but if addressed up front, could be a very entrepreneurial way to create entrepreneurial teams to create startup ventures from university research.

An even more aggressive approach would be for a University (or System) to create a for-profit company whose job it would be to cherry-pick technologies not already spoken for, develop them further and spin them off or develop them into a line of business. The company would act as an incubator, umbrella parent company, research institute and seed venture fund.

## Conclusion

All of these proposals need to be debated, examined closely and reviewed for unintended consequences. They are meant to stimulate thinking. But, they are all serious candidates that have some potential to address the challenge of making our university commercialization processes more effective and more productive.

The challenges are serious because of culture clashes, turf issues, budget constraints, disagreements about priority and mission, and inertia. But none of these are excuses for not acting to maximize the benefits to the State's economy from the investment we are making in world-class universities and top-notch research.

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<sup>i</sup> Title 35, Part II, Chapter 18, § 200. Policy and objective.

[www.law.cornell.edu/uscode/html/uscode35/usc\\_sec\\_35\\_00000200----000-.html](http://www.law.cornell.edu/uscode/html/uscode35/usc_sec_35_00000200----000-.html) and [www.access.gpo.gov/nara/cfr/waisidx\\_01/37cfr401\\_01.html](http://www.access.gpo.gov/nara/cfr/waisidx_01/37cfr401_01.html). Also, there is an excellent article, "INTELLECTUAL PROPERTY: Enhanced: University Licensing and the Bayh-Dole Act", Thursby and Thursby, *Science* 22 August 2003: 1052 DOI: 10.1126/science.1087473.

<sup>ii</sup> A term given to me by Thomas Kobayashi, a MSSTC student of mine who uses that term at work to describe bureaucracy: implies measurement visually: the thicker it is the worse it is!

<sup>iii</sup> *Who Owns Academic Work: Battling for Control of Intellectual Property*, Corynne McSherry, Harvard University Press, 2001, page 74. This is a dense but superb book for anyone wanting to understand the university culture and IP in a university sphere.

<sup>iv</sup> *Systems of Survival: A Dialogue on the Moral Foundations of Commerce and Politics*, Jane Jacobs, Vintage Books/Random House, 1992.

<sup>v</sup> *Managing the Partnership Between Higher Education and Industry*, Jana B. Matthews and Rolf Norgaard, National Center for Higher Education Management Systems, 1984, pgs 2 and vii.

<sup>vi</sup> *Open Innovation: the New Imperative for Creating and Profiting from Technology*, Henry Chesbrough, Harvard Business School Press, 2003.

<sup>vii</sup> "Promoting University Spin-Offs through Equity Participation". In *University Spin-Off Companies: Economic Development, Faculty Entrepreneurs, and Technology Transfer*. Meg Wilson and Steve Szygenda. Edited by Alistair M. Brett, David Gibson & Raymond Smilor. Lanham: Rowman & Littlefield Publishers, 1991. Pgs 153-163.

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