



# ***Managing the Pace of Innovation:***

## ***Outsourcing for Technology Transfer***

*by*

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Technology transfer, the practice of transferring inventions from one organization to another for commercialization, brings new products such as medicines, educational tools, electronic devices, safety equipment and health services to the public. Politicians, government officials, business leaders, and the media are paying attention and anticipating technology transfer’s promise for successful business development and economic growth in their particular geographic regions.

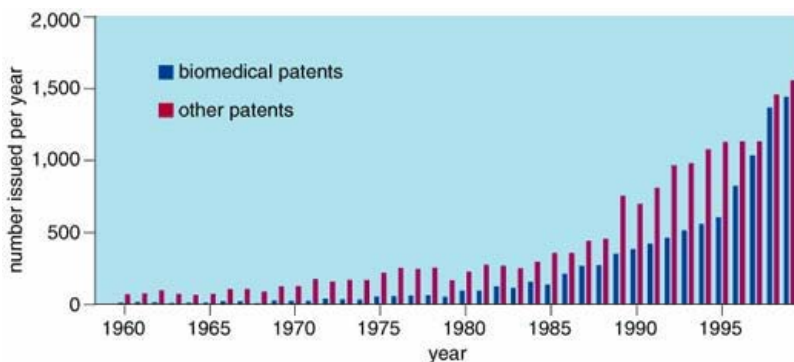
Within universities and research institutions, Technology Transfer Offices (TTOs) take the lead in commercializing research innovations developed by the inventors associated with their institutions. Institutions rely on their TTOs to identify commercial partners who can advance early-stage research and guide the commercialization process.

**Remarkable Growth after Bayh-Dole**

In its December 2004 issue, *The Economist* named the Bayh-Dole Act<sup>i</sup> “Innovation’s Golden Goose” and pointed out that it was the key to the reforms that unleashed American innovation.<sup>ii</sup> The enactment in December 1980 kicked off a dramatic growth in patents issued to inventors and their institutions. This in turn brought about growth of TTOs organized within their institutions to administer the patenting, marketing and licensing process and to manage the intellectual property portfolio.

Before 1980, there were only 25 TTOs and by 1995 there were approximately 200 offices.<sup>iii</sup> Staffing levels of US TTOs grew from approximately 400 FTEs in the early 1990s to 1,650 FTEs by 2004.<sup>iv</sup>

The concurrent growth in university patent activity is illustrated in the following figure.



University Patent Activity in the United States (Neumann, 2004)<sup>v</sup>

Because bringing products based on academic research to market requires significant investment, some TTOs limit their activity to managing the patent process, maintaining the intellectual property portfolio and licensing inventions to those that would commercialize the innovation. Other TTOs expand their scope to include guiding the start-up of new companies and work directly with venture capital firms. To this end, some institutions have formed affiliate corporations for new ventures. For example, ARCH Development Corporation formed in 1986 as a not-for-profit affiliate, commercializes technology developed in research laboratories at Argonne National Laboratory and the University of Chicago.<sup>vi</sup>

Regardless of the scope of activity of a particular TTO, the pressure to perform is high and commercialization activities are fast paced. Recognition of the critical role TTOs play in fostering new businesses has grown, along with the expectation that TTOs will bring economic benefit to their institutions through licensing revenues and, in some cases, equity in new businesses.

### Pressure on TTOs

Are TTOs keeping service capabilities in line with demand?

Anecdotal evidence offered by inventors and industry sponsors indicate TTOs have not. A January 2007 article in *The Scientist*, *The Trouble with Tech Transfer*,<sup>vii</sup> conveyed a range of criticisms by frustrated researchers, industry licensing specialists and venture capitalists. TTOs were chided as unresponsive to their own ambitious inventors and failing to understand what outside companies were seeking in the commercialization process.<sup>viii</sup> TTOs allegedly have employed poorly trained staffers, failed to recognize value and commercial promise, did not pursue leads, responded too slowly, were overly bureaucratic and did not understand corporate interests. With pressure on TTOs to generate revenues for their institutions, they are also accused of bargaining too long and hard with companies over contractual terms thereby killing deals. The hardball approach by TTOs might be pushing companies to look at foreign universities, as one company's research director commented "industry wouldn't be so tempted to look overseas if universities understood how companies must do business."<sup>ix</sup>

A related article in the same issue of *The Scientist*, *Fighting Tech Transfer and Winning*, a computer science professor developed a platform for designing new medical devices but was opposed by his TTO for widespread development of the technology as open-source.<sup>x</sup> Subsequently, this particular TTO was reformulated and streamlined.<sup>xi</sup>

John Fraser, Florida State University and President of the Association of University Technology Managers (AUTM), rebutted such criticisms in press pointing to examples of success at <http://www.betterworldproject.net> and noting that the US technology transfer enterprise is huge with more than \$100 billion in R&D annually, involving over 190 research universities, 700 research centers and laboratories of federal departments and agencies plus thousands of small and medium sized companies.<sup>xii</sup>



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John Fraser further responds:

Trouble in such a vast enterprise? Of course! It is to be expected in something involving some many clever, driven people working across disparate organizations over vast distances. But remember it works! And is playing an important role in saving lives, improving the quality of life and increasing productivity and competitiveness.<sup>xiii</sup>

### **No Wonder - The Pressure**

As noted previously, the AUTM US Licensing Survey: FY 2004 reports staffing levels for US universities at only 1,650 FTEs. Not many, considering the overall size of the US Technology Transfer enterprise. Notwithstanding the volume of innovation, TTOs must often handle diverse innovation sources such as life sciences, physical sciences, information technology, social sciences and educational methodology – plus a wide range of creative, intellectual, or artistic forms under copyright. Achieving and balancing a TTO's staffing level to have the right number of staff with the right mix and depth of skills is an ongoing challenge.

### **Outsourcing to Technology Transfer Intermediaries (TTIs)**

Can TTOs relieve the pressure through strategic outsourcing? In short, yes. Effective partnering of TTOs with TTIs will keep the vast technology transfer enterprise moving forward.

Outsourcing a particular activity or transaction to a TTI expert can improve turnaround time, access specialized expertise not available in-house and increase its value to the institution relative to its cost. The following questions identify if activities or transactions are ready for outsourcing:

- ✓ **Will the in-house turn-around time decrease the ultimate project value?**
- ✓ **Are you are giving up a competitive edge, missing out on opportunities and therefore losing value by not having best-in-class expertise?**

Outsourcing intellectually-based service activities like legal work, market research, product development, and logistics is not a new trend. To be sure, TTOs frequently use outside firms for specialty patenting and intellectual property protection. Beyond law firms, TTOs can access a growing number of Technology Transfer Intermediaries (TTIs) for a variety of services. Further, TTIs can be used to independently evaluate a technology transfer operation to find any practices that hinder a smooth movement of inventions through to commercialization.<sup>xiv</sup>



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TTIs range from niche providers to comprehensive commercialization support with a global reach. Within a TTO, a TTI can help balance the work load by assisting with any aspect of the commercialization process or some aspect of the administrative process. A short list of service examples include:

- ◆ Assessing the commercial viability of new inventions.
- ◆ Providing competitive intelligence and specialized market research.
- ◆ Supporting negotiations for licensing agreements.
- ◆ Evaluating intellectual property and identifying ways to extract value.
- ◆ Managing some portion of the intellectual property portfolio.
- ◆ Obtaining financing for start-up opportunities or to further research and development to increase technology value.
- ◆ Supporting new company formation.
- ◆ Providing interim management for start-ups.
- ◆ Bringing faltering start-ups back on track (turnaround management).
- ◆ Administering selected aspects of the TTO's operation.
- ◆ Managing access and contracting with proprietary innovation networks.
- ◆ Developing and installing software for managing disclosures and intellectual property.

Outsourcing a function or a transaction does not transfer accountability for results. The TTO retains ultimate responsibility, so services provided by TTI and the process must be effectively managed by the TTO to extract full value of the relationship (a topic for future white papers and services).

## Institutional Technology Transfer Offices (TTOs)

### Technology Transfer Administration

- Managing Invention Disclosures.
- Obtaining Intellectual Property Protection.
- Managing the Intellectual Property Portfolio.
- Managing Relationships with Licensees.
- Managing Relations and Progress of Start-up Companies.
- Reporting and Performance Tracking.
- Managing Ongoing Relationships with Internal and External Constituents.
- Managing Ongoing Processes Required by the Bayh-Dole Act.

### Commercialization

- Identify: Inventor submits an invention disclosure to TTO and the project is typically assigned to a particular TTO staff member responsible for the invention through its life cycle.
- Explore: What does the inventor want to do with the invention? Who has rights and ownership in the invention?
- Assess: Consider technical merit, commercial merit and timing.
- Decide: To proceed, or not? (If evaluation of commercial potential is very strong with no technical or legal issues blocking commercialization, the TTO is likely to proceed.)
- Evaluate: Range and nature of intellectual property protection.
- Protect: Obtain patenting and other legal protection.
- Strategize: Plan market scope, potential, duration, competition, and niches where invention would be in great demand. Should invention be licensed? Or commercialized through a start-up company?
- Execute: Implement commercialization strategy.

## Endnotes:

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<sup>i</sup> Enacted on December 12, 1980, the Bayh-Dole Act (P.L. 96-517, Patent and Trademark Act Amendments of 1980) created a uniform patent policy among the many federal agencies that fund research, enabling small businesses and non-profit organizations, including universities, to retain title to inventions made under federally-funded research programs. This legislation was co-sponsored by Senators Birch Bayh of Indiana and Robert Dole of Kansas.

<sup>ii</sup> Innovation's Golden Goose. *Economist*, December 14, 2002, p.3.

<sup>iii</sup> Mowery, D. C., and B. N. Sampat. (2001) Patenting and Licensing University Inventions: Lessons for the History of the Research Corporation, *Industrial and Corporate Change*. Volume 10 Number 2, 2001.

<sup>iv</sup> AUTM U.S. Licensing SurveyTM: FY 2004. p. 12.

<sup>v</sup> Neumann, Christian The Bayh-Dole Act – The Basis for U.S. Technology Transfer Office of Science and Technology, (Office of Science and Technology) Bridges, Volume 1 April, 2004 [http://ostina.org/bridges/pdfs/0401\\_06F-Patents.pdf](http://ostina.org/bridges/pdfs/0401_06F-Patents.pdf)

<sup>vi</sup> <http://www.archventure.com/history.html>

<sup>vii</sup> Silverman, Ed (2007) The Trouble with Tech Transfer. *The Scientist*, Volume 21 Issue 1, p. 40.

<sup>viii</sup> *Ibid.*, p 40.

<sup>ix</sup> *Ibid.*

<sup>x</sup> Silverman, Ed (2007) Fighting Tech Transfer and Winning. *The Scientist*, Volume 21 Issue 1, p. 43.

<sup>xi</sup> *Ibid.*, p. 44.

<sup>xii</sup> John Fraser, The Florida State University, and President, AUTM <http://www.autm.net/news/dsp.newsDetails.cfm?nid=96>

<sup>xiii</sup> *Ibid.*

<sup>xiv</sup> The Louisiana State University System evaluated its process expecting major operational changes as everything was scrutiny. See Clark, Steve (2004) Unclogging the Pipes. *Greater Baton Rouge Business Report*, November 23, 2004.