

The Business of University Start-Ups: Barriers and Solutions
DOUGLAS E JOHNSON

Volume 1

2002

Number 2

The Minnesota Journal of Business Law and Entrepreneurship is published twice a year at the University of Minnesota Law School. Publication is online only in Internet format at <http://www.kommerstad.org/journal>.

Hardcopy reprints are available for authors.

Submission requirements are available at the Web site.

Mailing address: Minnesota Journal of Business Law and Entrepreneurship
N130 Mondale Hall
University of Minnesota Law School
229 19th AVE SO
Minneapolis, MN 55455

Email: [editor \[at\] kommerstad.org](mailto:editor@kommerstad.org)

Telephone: 612-624-5779

© 2002 by the Regents of the University of Minnesota

The Business of University Start-Ups: Barriers and Solutions

DOUGLAS E JOHNSON^{*}

The major success of Medtronic, one of the world's leading medical technology companies, shows that commercial successes can result from University research, rewarding both society and investors. The commercialization of the heart pacemaker alone has had tremendous ramifications for the economy of the state, and has spurred the development of a thriving medical device cluster in Minnesota that is the envy of the nation.

The University of Minnesota is the primary research university in the state of Minnesota and among the top research Universities in the United States, with research expenditures approaching \$500 million per year. Over 6,000 doctoral-level scientists and graduate students conduct this research.

A few of the discoveries, inventions, and developments from University of Minnesota research endeavors are:

- Use of the compound Bretylium to treat cardiac fibrillation
- The first heart pacemaker
- Ultrasonic cancer screening
- Flight data recorders (black boxes) for aircraft
- Retractable seatbelts for vehicles
- Anti-HIV compounds – Carbovirs – to treat AIDS
- More than eighty crop varieties that have greatly increased yields worldwide
- The taconite process for making higher grade iron ore pellets from low-grade iron ore
- Vaccines and treatments for poultry and livestock diseases

^{*} Director, Carlson Venture Enterprise, Carlson School of Management, University of Minnesota

Commercialization of University research was made possible by the [Bayh-Dole Act](#) of 1980, which gave Universities the right to commercialize the results of all Federally funded research efforts. Subsequent to the Act, Universities have leapt into the business of commercializing their commercially interesting technology, either by licensing to an established company or by licensing to new startup companies.

About half of this research is in the field of health sciences, funded primarily by units of the Federal government such as the National Institute of Health. Leading-edge research efforts in fields such as stem cell engineering, genomics and bio-informatics appear to have great potential for the formation of future industry clusters and could have a profound effect on future industrial activity and development in the state.

The University of Minnesota today has done a remarkably good job in the field of technology commercialization, with 12 staff licensing professionals responsible for selecting, protecting and licensing those research disclosures that seem to be of interest to commercial entities.

	FY96-98	FY 00-02	
	Average/yr	Average/yr	% Increase
Disclosures	148	226	53%
New US Patent applications	51	78	53%
US patents issued	37	48	30%
Licenses and options			
New	56	81	45%
Startups	6	10	67%
Total active licenses and options	301	509	69%
Gross Revenues*	\$5.6	\$22.3	298%
Patent Expenses (not litigation)*	\$1.8	\$2.6	44%
Patent Cost Reimbursement*	\$0.8	\$1.1	38%

* Dollar amounts (\$) in millions

The table above shows that the number of licenses to start-up companies is increasing quite rapidly, from six per year (FY96-98) to 10 per year (FY 00-02).

Barriers to Commercializing University Research

Despite this progress, the reality is that starting new companies from University research can be a tough business. Failure rates are high and the road to success can be very long. Breakthrough technologies may be scientifically extraordinary yet have nonexistent commercial markets.

Finding experienced business people to work with scientists during the evaluation stage is a daunting task – scientific and business worlds are often incompatible. The cost of intellectual property protection is high, and early-stage capital is a problem. University startups must overcome the following obstacles:

- The scientists who developed the technology often wish to maintain their positions at the University rather than work full-time at the new companies formed to commercialize their discoveries. This makes investors wary, since adequate time may not be available to fix or improve a technology in order to make it work to commercially acceptable levels.
- The scientist may be confident that the business side of the company is really quite easy and may insist on maintaining a business leadership role, for which many scientists are ill-trained and ill-suited.
- Examining the future business potential of a brand new technology-based opportunity can be difficult, and scientists usually are not experienced or trained in that field.
- Finding a businessperson to run a new company can be very difficult – experienced business-people with proven track records of success often are not eager to take another large risk in their business careers.
- Many University-based technologies are at least a decade away from commercial success. A recent example at the University of Minnesota is Carbovir, the AIDS treatment that took 12 years to generate royalties.
- Many startup entities will not need enough capital at the initial stages of development to attract experienced venture capital investors, who prefer to invest at least several million dollars in a deal. Large investors only will invest later in the cycle, after much of the risk of the deal has been removed.
- A new firm may be forced to find investors in very small seed capital funds for their initial financing needs. An economic problem of small

seed capital funds is that most do not generate sufficient current income through management fees to attract partners who are experienced in early-stage companies or skilled in leading new entities to commercial success.

A Solution for Success

For startup companies based on University technologies, these six problems have proven to be formidable barriers to success. Fortunately, a recently formed experiential learning project at the University's Carlson School of Management – the Carlson Venture Enterprise – can address these problems and bridge the gap between University researchers, venture capital investors, and the entrepreneurial community.

In addition to providing a rich learning experience for MBA students, the Carlson Venture Enterprise will have many positive effects for researchers at the University, the entrepreneurial community and the economy of the state of Minnesota.

The Venture Enterprise mission is to use the entrepreneurial talents and networks of the Carlson School to facilitate the creation of excellent high growth firms. The Enterprise primarily focuses on the breakthroughs in science and technology developed within the University.

The Enterprise provides Carlson School full-time MBA students with a unique educational experience for beginning a career in the assessment of new business ideas. Learning occurs through a combination of lectures, assignments, and hands-on, real-world experience where students work directly with scientists in evaluating the commercial feasibility of new technologies.

The goal is to have Venture Enterprise students involved in all aspects of the creation of a high potential venture, including analysis of management, financing needs and potential market acceptance. Students present their findings and recommendations to a Board consisting of venture capitalists, investment bankers, entrepreneurs, industry experts and faculty.

Students work with scientists and the Carlson School faculty to determine whether a technology should be commercialized through a new company start. Some of the questions they consider:

- What is the value of the technology?

- Is the technology unique and can it be protected from competition?
- Can the technology work to commercial standards?
- Is the market large enough to justify a venture capital investment?
- What is the business model for this business?
- Can we recruit a management team for this business?
- Can we raise sufficient capital to execute the business plan?

In those cases where a compelling case can be made, the students present these concepts to a board of experienced venture capital investors, investment bankers, and entrepreneurial managers who provide input as to whether or not the company can be financed. If the discussion is positive, the Venture Enterprise students work with the early-stage firm in the financing effort as well as in the execution of the business plan. For Venture Enterprise students, real-world experience in the analysis of new business development is very valuable.

The Venture Enterprise process offers the following solutions:

- For early-stage seed capital investors as well as early-stage CEOs, much of the due diligence work and company sorting is done by Venture Enterprise, which acts as a “filter,” pursuing only those ventures that have potential commercial value. This activity eliminates over 90% of the analysis work, since less than 5 out of 100 deals at this stage can be financed.
- Scientists at the University receive professional experienced assistance in determining whether or not to pursue the commercialization of a given technology.
- For those deals that seem promising, connections have already been made between the scientist and the entrepreneurial community.

Although we are in the early stages of the Carlson Venture Enterprise, the future looks promising. Last year’s class evaluated about one hundred new opportunities and continues to work with four very interesting new businesses. The promise of this program will continue to provide value to students, scientists and the community well into the future.