

Technology Commercialization at the University of Illinois: Growing the Illinois High Technology Economy

Submitted to:

The Illinois Board of Higher Education
The Illinois Department of Commerce and Community Affairs
The Illinois General Assembly

In response to Illinois House Resolution 308
by the
Office of the Vice President for Economic Development and Corporate Relations
on behalf of the
President of the University of Illinois

April 2002

Technology Commercialization at the University of Illinois: Growing the Illinois High Technology Economy

Executive Summary

Recognizing the prominent role that the University of Illinois plays in laying the technological foundation upon which the Illinois high-tech economy is built, Governor George Ryan and the Illinois General Assembly invested in several high technology initiatives at the University through the Illinois VentureTECH program. In addition, the Illinois Senate has resolved (SR 296) "...that State research-based universities of Illinois be encouraged to expand their role in statewide economic development;" and that they "...be encouraged to use their facilities, equipment, research scientists, and staff's time and services, and other resources for the development and commercialization of new technological and scientific innovations."

In parallel, the University's Board of Trustees has acknowledged the University's responsibility to support the creation of new businesses, jobs, and wealth within the Illinois and US economies through commercialization of University-based technologies and intellectual properties, while fostering the continuous advancement of the University's premier education and research programs. Critical components of these initiatives include effective offices of technology management, research parks and incubators, mentoring and services for start-ups, and corporate, business, and public agency relationships.

To strengthen the University's capacity to meet these responsibilities, the Board of Trustees has created a new Office of the Vice President for Economic Development and Corporate Relations (OVPEDCR) to facilitate all facets of the University's technology commercialization activities; appointed a Board of Trustees Committee on Economic Development; established the IllinoisVENTURES, LLC to facilitate the formation of new companies based on University technology; and formed the University of Illinois Research Park, LLC to manage operations in the research parks and business incubators constructed by the University.

The University's initiatives to improve the effectiveness of technology commercialization are focused on the infrastructure, human resources, policies, and processes that enable the creation of intellectual property and facilitate its translation into commercial products. The discussion of these technology commercialization activities tracks the progression from faculty/student research discovery through technology transfer to commercial product and includes: the importance of sustained investment in state-of-the-art research facilities and the recruitment and retention of the highest quality faculty and students; the University's renewed commitment to effective policies/processes and, most importantly, professional staffing for the timely protection, marketing, and licensing of technology/intellectual property by the University's Offices of Technology Management (OTMs); new initiatives to catalyze and support faculty/student entrepreneurs in the formation of new companies to commercialize University-based technology, such as the Start-up Services Company of IllinoisVENTURES, LLC and the provision of incubation and graduation space/facilities in the University's research parks; and the implementation of partnerships between IllinoisVENTURES, the OTMs, the incubators, the campuses' academic programs in entrepreneurship, and corporate/community technology transfer organizations in order to maximize the return on the State's investment in the University's infrastructure for technology commercialization.

Technology Commercialization at the University of Illinois: Growing the Illinois High Technology Economy

I. Introduction

Illinois House Resolution 308 passed by the House of Representatives of the 92nd General Assembly resolved “that each Illinois research college and university develop a plan that demonstrates the effective transfer of technology from the university to the private sector”, and “That these institutions submit a report ... on the number of patents recorded, new licenses and registrations of commercial technologies attained, the number of start-up companies formed, and the number of companies involved in research incubators; ...” The University of Illinois welcomes the opportunity to provide this report on the commercialization of the innovative technologies developed on its Research I (Research Intensive) campuses at Chicago (UIC) and Urbana-Champaign (UIUC.)

Governor George Ryan and the Illinois General Assembly have made continued high-tech economic growth of the Illinois economy through the commercialization of research-based discoveries a major priority. The Illinois VentureTECH program was established to implement this priority by enhancing the capacity to create advanced technologies in Illinois and to accelerate the commercialization of these technologies. Recognizing the prominent role the University of Illinois plays in creating and commercializing new technologies upon which the Illinois high-tech economy is built, several VentureTECH investments have been made at the University.

The University’s Board of Trustees (BoT) has acknowledged the University’s unique responsibility in fostering the creation of new businesses, jobs, and wealth within the Illinois and US economies through commercialization of University-based technologies and intellectual properties, while continuing to advance the University’s premier education and research programs. Critical components of the advanced technology creation and commercialization process are effective offices of technology management, modern research parks and incubators, world-class mentoring and business development services for start-ups, and respected corporate, business, community and public agency relationships.

The BoT and University leadership have acted decisively to strengthen the University’s ability to commercialize the technologies developed on its campuses. The Office of the Vice President for Economic Development and Corporate Relations (VPEDCR) has been created to facilitate all facets of the University’s technology commercialization activities at UIC and UIUC. Under this new organizational structure, depicted in Appendix (a), the Vice Chancellors for Research (VCRs), as the responsible campus officers, report to their respective chancellors *and* to the VPEDCR (dual reporting) concerning campus technology commercialization activities. The Trustees also established: a BoT Committee on Economic Development to provide overarching guidance on policy; the IllinoisVENTURES, LLC to facilitate the formation of new companies based on University technology; and the University of Illinois Research Park, LLC to develop and manage the research parks and, where appropriate, new business incubator facilities.

A schematic representation of the process of technology commercialization from research to high-tech economic development is shown in Figure. 1. The report (sections II-VI) on the University’s activities in technology commercialization tracks this progression.

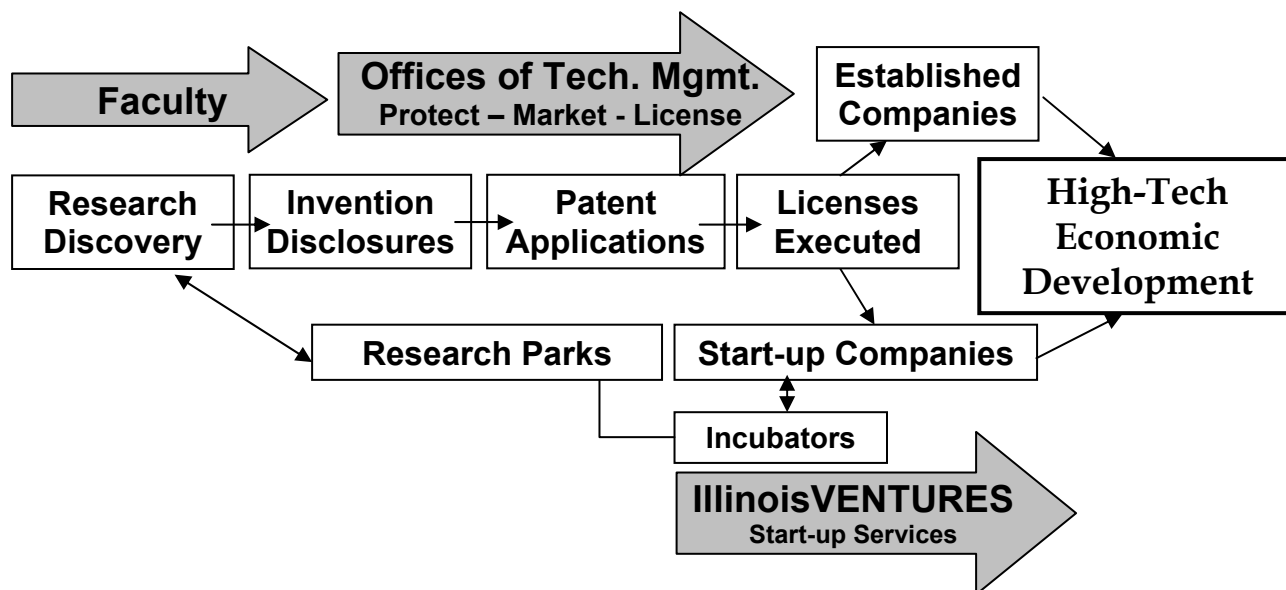


Figure 1. Schematic representation of the process of technology commercialization from a research university to the private sector.

II. Resources for Research: the Foundation of Technology Commercialization

Continuous growth in federal, state, and corporate research funding over the past 50 years has created a system of research universities that currently expends hundreds of millions of R&D dollars annually on *each* of the top 100 campuses. For example, in FY-2000 the aggregate R&D expenditures on the Chicago and Urbana-Champaign campuses of the University of Illinois totaled \$570 million. The \$380 million total for the UIUC campus placed it 16th among all U.S. universities, and the \$180 million total for UIC ranked 49th in the nation. Universities whose research expenditures place them in the top 50 nationally, have for several decades been classified as “Research I” universities. Both UIUC and UIC met this standard in FY-2000. The University of Illinois, then, comprises *two* Research I universities.

To attain and to maintain this level of success in the competition for research funding from federal, state, and private sources, the investments in cutting-edge research facilities and equipment and the highest quality faculty, students and staff must be continued. This is the research and discovery engine that drives and creates new knowledge and technologies. In addition, the University must be able to provide substantial amounts of matching funds to compete for large federal research grants. Most grant programs now require a specified percentage of matching funds from the research institution.

Modern Research Facilities: A partial listing of major investments in the research infrastructure of the University of Illinois over the past two decades includes - on the Urbana-Champaign campus: the Beckman Institute, the Grainger Engineering Library Information Center, the Microelectronics Laboratory, the new Coordinated Sciences Laboratory, the Digital Computer Laboratory, the Superconductivity Center, the ACES Library Information and Alumni Center, the Chemical and Life Sciences Laboratory, and the Edward R. Madigan Plant and Animal Biotechnology Laboratory; on the Chicago campus – the Molecular Biology Research Building, the Outpatient Care Center, the Engineering Research Facility, the Microfabrication Applications Laboratory, the Research Resources Centers, and the Biologic Resources Laboratory. These and

other specialized research facilities have been essential contributors to the campuses' success in the competition for research funding and in powering the University's high technology invention engine.

Several new capital projects and operating programs for the University of Illinois were included in the multi-year VentureTECH program. These projects include: at the Urbana-Champaign campus – the Post-Genomic Institute, doubling the size of the renamed Micro and Nanotechnology Laboratory, a new building for the National Center for Supercomputing Applications (NCSA), a business incubator, and the Siebel Center for Computer Science (funded in part by a private matching gift of \$32 million); at the Chicago campus – the Medical Sciences Building, the Advanced Chemical Technologies Building, and construction of a 9.4 Tesla Magnetic Resonance Imaging Center to be led by the nation's foremost scholar/researcher in medical resonance imaging, a UIC faculty member.

Plans for advanced scientific research facilities to enhance significantly the University's capabilities for the creation of new technologies are continuously being developed. One example is a new facility for Advanced Computing and Communications Technology at Urbana-Champaign. Another example is a new biomedical genomic laboratory in Chicago. Each of these facilities will make it possible for UI faculty scientists and researchers to add tens of millions of dollars to the Illinois economy when funded and fully operational.

Faculty Talent: Recruiting, retaining and enabling high quality faculty researchers is a high priority in the University's on-going actions to enhance its status as one of the nation's premier public research institutions and source of exciting high technology discoveries. The realization of this priority will strengthen its capability to generate each year the hundreds of millions of dollars in sponsored R&D support that fuel the University as an invention engine for high technology business and economic growth in Illinois. Primary factors in the University's ability to recruit and retain the highest quality faculty are competitive compensation, funding for initiation of new research programs, quality of research facilities and infrastructure and, increasingly, university policies, culture, and technology commercialization infrastructure to encourage faculty entrepreneurship. Other factors include the environment of excitement and enthusiasm associated with technology innovation and commercialization, and rewarding, well-compensated jobs for graduates and trailing spouses that are created by the formation of start-up companies or by attracting established high-tech companies to locate or expand in Chicago and in Urbana-Champaign, near the University's campuses.

The University has revised its policies for the administration of intellectual property and the management of conflicts of interest and commitment to reduce impediments and enhance incentives for faculty to pursue opportunities to commercialize new technologies resulting from their research. The technology commercialization infrastructure is being enhanced to make the technology transfer processes and procedures more transparent, accessible, efficient and responsive to the creator/inventor. Timely processing of disclosures and patent applications, and aggressive marketing of the University's intellectual property portfolio are critical aspects of these improvements. The policy regarding the distribution of revenues from the licensing of intellectual property has been modified (effective September 3, 1998) such that the creator's share of net revenues is now 40%, which is highly competitive with policies in peer institutions.

There is a strong, reinforcing interdependence between the University's successes in attracting sponsored research funding, conducting high quality research, and creating and commercializing

new technologies that drives the new high-tech economy in Illinois. If the University of Illinois is to retain and grow R&D funding and provide the impetus for advanced technology-based business and economic development, investments must be made continuously to improve its competitive position, nationally, and to improve its performance in technology commercialization and business development.

III. Offices of Technology Management: Protecting and Transferring Intellectual Property

Commercialization of technologies derived from UI research programs is critically dependent upon the ability and capacity of the UIC and UIUC Offices of Technology Management (OTMs) to protect and market the associated intellectual property. Both of the OTMs report through their respective Vice Chancellors for Research to the VPEDCR. The coordinated operations of the OTMs are based upon clear statements of vision, mission, responsibilities, and guiding principles:

Vision: Become the foremost technology management offices in the U.S. with a commitment to technology transfer and service excellence.

Mission: The mission of the OTMs is to encourage innovation, enhance research, and facilitate economic development, through protecting and commercializing intellectual property for the benefit of the faculty, staff and students, the University, the communities and regions of the University's research campuses and the State of Illinois.

Primary responsibilities of the OTMs:

- Provide information and services related to intellectual property to inventors/creators
- Identify and encourage disclosure of inventions and copyrighted works, including software
- Evaluate disclosures for patentability and marketability
- File, prosecute and maintain U.S. and foreign patents
- Value technologies for marketplace
- Market technologies and copyrighted materials by locating commercial partners and licensees
- Exchange information, negotiate and finalize deals with commercial partners or licensees
- Enforce license terms and monitor licensee's development progress
- Facilitate University and campus entrepreneurial activities
- Monitor infringement
- Maintain intellectual property related records, and financial records
- Monitor new legal and regulatory developments
- Provide education and information
- Administer, interpret, and recommend changes to intellectual property and licensing policies and develop licensing guidelines

Guiding Principles:

- Allow decentralized focus for decisions to be made involving input from inventors/creators, their units, colleges and the OTMs.
- Share responsibility between OTMs and college/unit to provide a balance between commercial and academic objectives.
- Process matters in a timely manner in order to utilize effectively the window of opportunity to transfer University-owned intellectual properties.
- Create effective and consistent processes and systems within the OTM to maintain a high level of work efficiency.
- Educate OTM constituency about intellectual property, technology commercialization, University and government policies and regulations, and the role OTM plays in this process, in order to invigorate transfer of University-owned intellectual properties to the private sector.

Business Model: In the context of an effective business model, adequate staffing for the OTMs is key to fulfilling the mission and goals of the University's technology commercialization program. An aggressive plan is being implemented to hire, train, and retain technology specialists who screen disclosures submitted by faculty and students, and are responsible for patenting, marketing, and licensing the intellectual property. A decentralized business model guides the OTMs on both campuses. This model encourages decisions to be made with involvement from inventors/creators, their units and the OTM. Key to the model is the joint hiring and placement of technology managers in units, reporting to both the units and the OTM. These unit technology managers work with inventors/creators, collaborate closely with other OTM technology managers, and work with outside marketing and licensing experts to screen, assess, protect, market, and license technologies. The unit technology managers have primary marketing responsibility for the technologies developed in their units, and leverage the industrial connections and marketing expertise already held at the unit level to benefit technology marketing activities.

The decentralized model employs specialized professional staff to support the technology managers. These professionals include information specialists, marketing services specialists, paralegal and contract drafters, federal and license compliance specialists, business managers/accountants, and external patent attorneys. The staffing plan of the decentralized business model for the UIUC OTM is provided as an illustration in Appendix (b).

Benchmarking: As a consistent means of benchmarking performance, the OTMs track the most frequently used measures of technology transfer effectiveness: the number of invention disclosures; the number of U.S. patents filed; the number of licenses/options executed; the number of licenses/options yielding income; the gross licensing income; and number of start-up companies. The database established by these tracking procedures has been used to provide the specific information required by Illinois House Resolution 308, as shown in Appendix (c). In addition, the progress made in various personnel and performance initiatives in the Chicago and Urbana-Champaign OTMs are presented in Appendix (d), *Technology Management Update* (dated Jan 16, 2002).

IV. Start-up Services: Supporting New Ventures

An increasingly important pathway for the commercialization of University-developed technology is through the formation of new companies – start-up companies. Although new companies constitute less than 10% of the technologies commercialized, the creation of high-technology start-up companies whose R&D basis ties them to the University confers an array of benefits upon the University, the communities and regions of the University’s campuses, and the State of Illinois. These benefits include:

- Financial (revenue, jobs, tax base)
- Outlet for entrepreneurial interests of faculty and students; faculty retention/attraction
- Environment of excitement and enthusiasm
- Rewarding, well-compensated jobs for graduates and trailing spouses
- Opportunities: research agreements and gifts

While the University has provided many important technology transfer services, the provision of assistance and mentoring to faculty/student entrepreneurs seeking to develop and commercialize University technologies by forming start-up companies has been less well developed. The incubator facilities on the two campuses provide affordable space for start-up companies, and the research parks are structured to accommodate the needs of more mature companies in the growth stages of the business cycle. What has been less available are early-stage business development services for promising new ventures bringing University-based technologies to market. With the continuous availability of these services, the creation, funding, early development and commercial success of nascent, but potentially rapid growth, new businesses will be accelerated.

The BoT established IllinoisVENTURES, LLC specifically to provide early-stage business development services to new, high-potential companies that are commercializing University intellectual property. The BoT is the sole member of the LLC. The IllinoisVENTURES Board of Managers (members listed in Appendix (e)), at its meeting in March 2002, elected Board officers, appointed an interim CEO/Managing Director, and opened the doors/authorized operations of its Start-Up Services operation. To fulfill its responsibilities, IllinoisVENTURES Start-Up Services Company will employ full-time, experienced, successful entrepreneurs as professional business development managers. These professionals will work closely with faculty and staff entrepreneurs and inventors to catalyze the creation and accelerate the development of new ventures to bring University-based advanced technologies to market as rapidly as possible.

To establish a world-class environment within the University and its Chicago and Urbana-Champaign campuses for commercializing technology through start-up companies, the general structure for IllinoisVENTURES is as follows:

Action Programs:

- Supports the OTMs with “in-reach” for the early engagement of faculty entrepreneurs to catalyze the creation and accelerate the development of high potential start-up companies based upon University technologies.
- Works cooperatively with the OTMs to facilitate the transfer of promising technologies and their inventors for screening and mentoring as prospective start-up companies.
- Screens prospective start-up companies to identify those nascent technology-based

business concepts that have the potential to become viable start-up businesses.

- Coaches founders/entrepreneurs of prospective start-up companies in the development of paths to technology commercialization, business plans, market opportunities and strong managerial and technical expertise.
- Makes referrals for accounting, legal, insurance, personnel, marketing and sales, operations, website development, testing and development, and managerial and scientific advisory talent.
- Goal is to develop the capacity to invest up to \$100,000 in pre-seed funding per start-up for further commercial development and/or for the purchase of needed specialized services.
- Provides continuous early stage high level mentoring to new start-up companies (utilizing faculty members and students when appropriate) as they develop and prepare to secure public (SBIR, STTR, TCP) and/or private investment funding; maintains extensive networks of investors, service providers, and corporate contacts.
- Provides mentoring of and services to start-up companies located in University Incubator facilities, in cooperation with the University of Illinois Research Park and the Chicago Technology Park.

Leadership:

- Management and staff: A managing director and two business development managers. The managing director provides overall leadership, and has responsibility for pre-seed investments and for networks to private firms and public agencies. The development managers seek and identify start-up company opportunities, screen start-up prospects, and provide start-ups the highest level of professional mentoring, coaching and counseling. Incentive based compensation will be important.
- Screening advisory panel: A screening panel/investment board of not more than five experienced entrepreneurs advises the managing director and staff. Members may also serve on the Board of Managers of IllinoisVENTURES, LLC or the Board of Managers of University of Illinois Research Park, LLC.

Funding/Support:

- Recurring public funding for: 1) core management professionals and staff; 2) contracting for outsourced services (technical, business, legal, etc.); and 3) pre-seed funding pool.

IllinoisVENTURES will work very closely with the University's OTMs, and incubators, the research parks, community and regional economic development groups connected with the campuses, the private sector and State and federal government programs and agencies.

V. Research Parks and Incubator Facilities

Research Parks: University-associated research parks at UIC and UIUC are designed to attract established high-technology companies to campus communities, to support the continued development of companies commercializing University-based technologies, and to encourage R&D collaboration between industry and the University. Candidate companies to be recruited by the research parks include: University and non-University start-up companies; established small-to-medium sized companies wishing to relocate in proximity to the University's campuses;

and major companies wishing to locate satellite operations or research facilities in proximity to the University's campuses. Location in proximity to the University enables companies to:

- work with and recruit talented students before they enter the competitive workforce
- utilize faculty as technical resources for consulting and cooperative R&D
- obtain assistance with manufacturing technology
- utilize University research facilities and services
- assess and license University-developed technology
- establish student internship programs
- have key employees participate as adjunct faculty
- attend technical seminars and symposia
- have employees pursue advanced degrees in technology, business, management
- participate in on-site continuing education and staff development programs

The research parks associated with the UIC and UIUC campuses of the University have common goals, but differ in their age, stage of development and maturity, differ in their community and regional environments, and differ in their legal structure and administrative operations.

The Chicago Technology Park (CTP), which is affiliated with the University, is located in and operated by the Illinois Medical District (IMD). The CTP lies to the west of the UIC campus, just 2.5 miles from Chicago's Central Business District – a quintessentially urban environment. Founded in the early 1980's, the CTP is home to 30 biotech, medical research, and pharmaceutical companies which occupy over 600,000 sq. ft. in ten buildings, including the University's Research Center, an incubator facility (a total of approximately 475 jobs.) From 1991 to 2001, 34 companies graduated from the CTP, of which 80% are still in business. This is a very good success rate. Twenty companies have remained in the greater Chicago region creating approximately 4,200 jobs.

In the CTP, two buildings (20,000 and 77,000 sq.ft.) provide expansion space for maturing start-ups and contain wet labs, processing facilities, office space and meeting rooms. A 20,000 sq. ft. Enterprise Center II funded under the VentureTECH program opened in spring, 2002. Near-term plans include a 60,000 sq. ft. Tech Transfer Center, opening in fall 2002, and the designation of 17 acres in the CTP as the Chicago Technology Campus.

Over the next ten years, several million square feet of additional development are planned in the CTP. These developer-constructed tenant buildings will provide graduation space for maturing start-up companies moving from the University's incubators or from other facilities.

Development of the University's Research Park at Urbana-Champaign, which began in late 1999, is proceeding on both the north and south campus sites (North Center and South Center.) The BoT established the University of Illinois Research Park, LLC (UIRP) in January 2000 and subsequently approved the UIRP master development agreement with the private developer partner, Fox/Atkins Development, LLC. Construction began for the Motorola Design Center in the South Center, the first facility to be built in the Research Park, in spring, 2000. The Trustees appointed an eleven member Board of Managers for the UIRP, LLC (Appendix (f)) responsible for strategic direction and operating policies. The BoT is the sole member of the UIRP, LLC.

The Urbana-Champaign Park will include the University-owned incubator facility (South Center), multi-tenant facilities to house developing and mature companies (constructed on University land in partnership with Fox/Atkins Development, LLC), facilities to house closely-allied University activities, and mature companies that may develop their own facilities on University land. Currently, over 310,000 sq. ft. of tenant space is either completed, under construction, or in design. This space includes the Motorola building, two completed multi-tenant buildings, the incubator (under construction; fall 2002 completion planned), and one multi-tenant building in design. The South Center of the park houses 201,000 sq. ft. of completed space of which 185,000 sq. ft. is leased. A planned phase II site will encompass 270,000 sq. ft.

Near the North Center site, construction is underway for the new NCSA building and the Thomas M. Siebel Center for Computer Science. Initiatives involving land acquisition, utility, and infrastructure planning and municipal interface are ongoing for the development of the North Center. Construction in the North Center is anticipated within three years.

It is forecasted that between 500,000 to 1,000,000 sq. ft. of office and laboratory space will be constructed in the South Center and North Center of the University's Research Park at Urbana-Champaign over the next five to ten years. The job growth forecasted with this development is between 2,500 and 5,000 new jobs. All new jobs will, in turn, create additional support services and amenities for the greater Champaign-Urbana regional economy.

Incubators: The new business incubators associated with the UIC and UIUC campuses enable and accelerate the commercialization of University based technologies by providing flexible, reconfigurable space, tenant support and incubation services, proximity and access to University research facilities and services, and a mentored environment, all at reasonable cost.

The incubator (Research Center) associated with the UIC campus was constructed by the University in the mid-1980s at a cost of \$7.5 million. The Research Center is in the CTP and is cooperatively administered by the CTP and the UIC. This wet lab incubator has 57,000 sq.ft. of incubation space, including 39 wet labs, offices, and meeting rooms. It has been at 100% occupancy for the past several years.

In 1989, a rudimentary, early-stage incubation facility, the Technology Commercialization Laboratory (TCL), was established on the south campus of the UIUC with funding from the Illinois Department of Commerce and Community Affairs. Offering limited business incubation services to 10 to 12 start-up companies, the heavy utilization and continuous demand for space in the TCL demonstrated the need for a modern, full-service incubator. While the TCL will continue to serve its function for embryonic companies, a 44,000 sq. ft., \$8 million new business incubator building, funded by VentureTECH, is under construction in the South Center of the University's Research Park at Urbana-Champaign. Slated for completion in fall 2002, this state-of-the-art facility will have reconfigurable laboratory space, office space, conference rooms, and associated facilities to accommodate 25 to 30 high technology start-up companies. The Start-up Services Company of Illinois VENTURES will provide incubation services to tenants of the incubator under contract with the UIRP, LLC.

External Use of University Facilities and Services: Consistent with the University's key role in the acceleration of the Illinois high-tech economy, the University is committed to continuously improving the accessibility of its facilities and services to start-up companies, tenants of its research parks, occupants of incubators, and others deemed essential to fulfill this role.

In 2001, the University-Wide Facilities and Services Usage Task Force established by the VPEDCR carried out a detailed examination of University and campus policies and procedures applicable to various categories of users of University facilities and services. The Task Force made recommendations concerning: 1) the classes of services offered to outside users; 2) a methodology for costing facilities and services; 3) processes, procedures, and points of contact for responding to requests for use of facilities and services; and 4) development of standardized agreements for Facilities Use and for Technical Testing. The Task Force defined improved access as including favorable rates for services provided, availability of the broadest possible range of facilities and services, and most importantly, rapid response time and streamlined procedures for acquiring access.

The findings and recommendations of the University-wide Task Force have been submitted by the VPEDCR to the Vice Chancellors for Research for implementation, as appropriate, on their respective campuses. A one-page outline of the key recommendations and issues from the report of the Task Force is provided as Appendix (g). The Vice Chancellor for Research at UIC has acted on the recommendations in the report. The Vice Chancellor for Research at UIUC appointed a campus task force that developed a plan for application of the recommended policies and procedures on the Urbana-Champaign campus which is now being executed.

VI. Partnerships

OTMs, Incubators and IllinoisVENTURES: The OTMs are typically the first point of contact between an inventor (potential entrepreneur) and the University's technology commercialization organization. The OTM's technology managers identify promising technologies and their inventors as prospective start-up ventures, working closely with the business development managers of IllinoisVENTURES. Effective partnering between the OTMs and IllinoisVENTURES will assure a transparent, efficient, intellectual property management system and early business development services for promising new ventures.

Through a formal contract-for-services between the UIRP, LLC and IllinoisVENTURES, LLC, incubation and early-stage business development services will be provided by IllinoisVENTURES Start-Up Services Company to tenants in the University's incubator in Urbana-Champaign and to prospective tenants of the incubator. IllinoisVENTURES business development professionals will, as well, work closely with the University's incubator, the Research Center, in the CTP, to provide a world-class environment for the successful commercialization of University-based technologies through the founding and growth of viable new high-tech companies.

UIC and UIUC Entrepreneurial Education Programs: As the University accelerates efforts to commercialize technologies generated on its campuses, it is essential to provide students with entrepreneurial education opportunities and benefits made possible because of the University's technology commercialization and economic development activities. Also, there is potential value to the technology commercialization process, and especially to start-up companies, from the opportunity to work with MBA, engineering and science graduate students and perhaps undergraduate students, and their faculty sponsors. Certainly, informal student internships in the campuses' technology transfer operations, IllinoisVENTURES, research parks, incubators, and established companies and new companies are and will continue to be important.

Currently, the most prominent entrepreneurial education programs are: at UIUC - the Technology Entrepreneur Center in the College of Engineering (COE), the Center for Enterprise

Development and the Office of Strategic Business Initiatives in the College of Commerce and Business Administration (CBA), the Technology and Management Program which bridges the COE and the CBA , and the emerging clinic in the College of Law for intellectual property, technology transfer and management, and new ventures; at UIC - the Institute for Entrepreneurial Studies, the Center for Urban Business, and the Entrepreneurship Intern Program in the College of Business Administration (CBA), and the Bioengineering Entrepreneurship Program which bridges the College of Engineering and the CBA.

To more formally establish cooperating relationships to maximize the benefits to students and to the University's support for emerging new companies, memoranda of cooperation between IllinoisVENTURES, LLC, and the entrepreneurial education programs will be executed. The objectives are to maximize the educational value for students, and to establish and maintain a consistent world-class, dynamic environment for commercializing technologies through the business and financial success of new companies based on University technology.

Local and Regional Economic Development Organizations: To maximize success, the University's technology transfer and economic development activities need to be coupled with the local community and regional economic development organizations and activities focused on advanced technology as an engine for business and economic development. The best current example of these partnerships is the cooperation of the University's campuses and its start-up services operation, IllinoisVENTURES, in the competition for grant funds through the Illinois Technology Enterprise Center (ITEC) competitive grant program of the Department of Commerce and Community Affairs.

IllinoisVENTURES is in partnership with the Urbana-Champaign campus, the University's UIRP, LLC and the greater Champaign-Urbana high-tech development organization, techCommUnity, in the East-Central Illinois ITEC proposal. In Chicago the partnership for an ITEC grant proposal includes the CTP and IMD, the Illinois Institute of Technology (IIT), UIC and IllinoisVENTURES. The Heartland-ITEC proposal for the greater central Illinois Peoria region includes a partnership with IllinoisVENTURES and UIUC, with Bradley University, CAT, and the USDA Agricultural Research Service (ARS) Laboratory, the National Center for Agricultural Utilization Research as the prime greater Peoria sponsors.

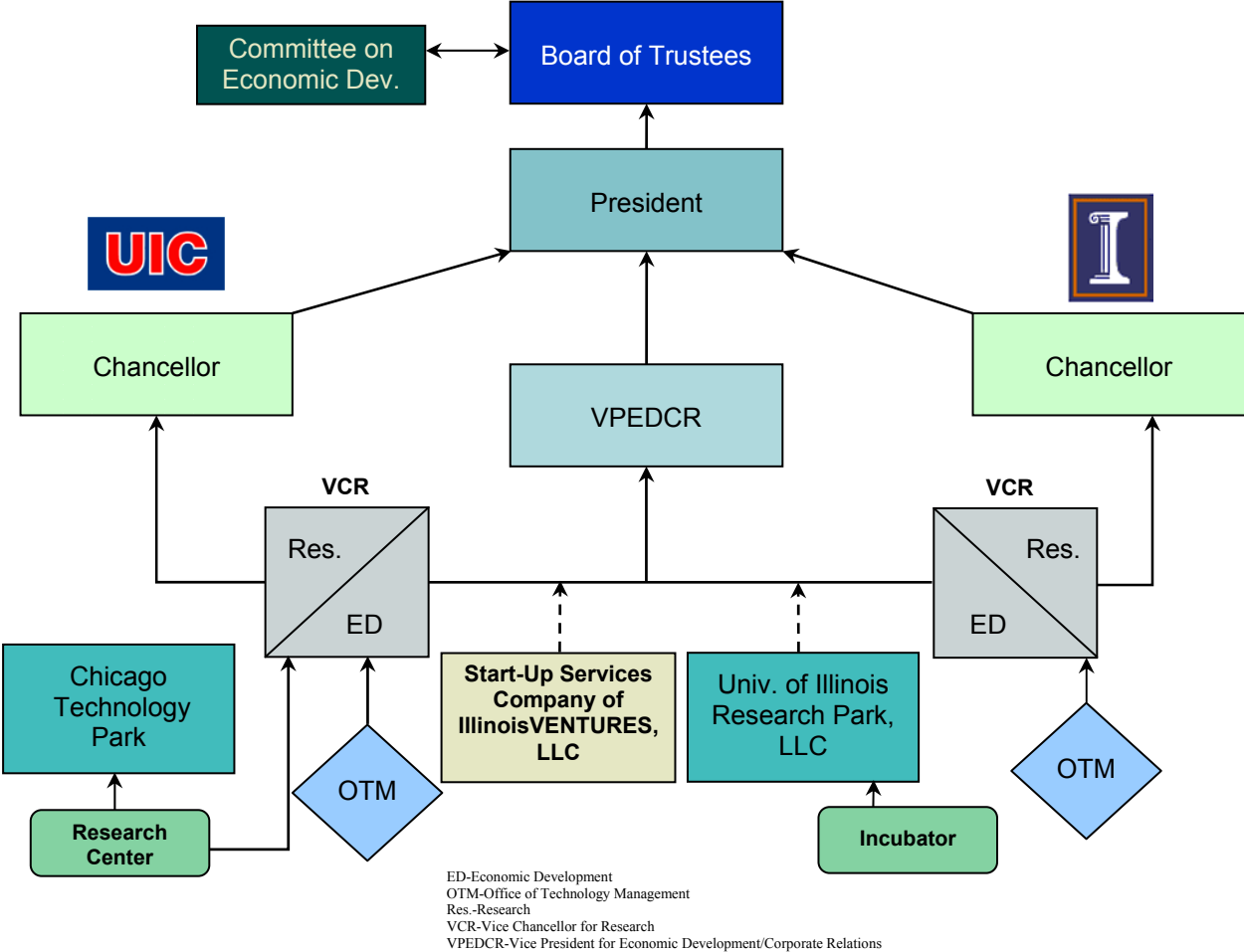
Private Sector, Public Agencies and Other Universities: Continuous, enriched working relationships with providers of investment capital are essential if the University is to fulfill its responsibilities to help propel Illinois' new high-tech economy in the 21st century. Included are relationships with individual angel investors and venture capital funds, business development and legal services providers, technology and business development consultants, established technology companies - especially Illinois headquartered firms - and state and federal agencies. Network development and management are ongoing across all of the dimensions of the University's technology commercialization operations. It is the responsibility of all components of the system. Working relationships with trade organizations, such as the Illinois Venture Capital Association (IVCA) and the Illinois Biotechnology Industry Association (iBIO), and with the Mayor's Council of Technology Advisors and Illinois Coalition, are very important for successfully capturing the opportunities in Illinois for fostering new economic activities based on University research and development.

Close collaboration among Illinois' premier research universities, including University of Chicago and Northwestern University, and federal laboratories, such as Argonne National

Laboratory, are an important part of the drive to build Illinois' and the Chicago region's new high-tech economic future. An illustration of this collaborative spirit is the Chicago Technology Forum where new ventures commercializing research-based technologies from the premier research universities and federal labs in Illinois are presented to the investment community, business service providers and others on a quarterly basis. This technology/new ventures showcase helps create the energy and enthusiasm across the private sector, research university, and federal research laboratory space to move new companies based on research discoveries into the forefront as they embark on their journey to commercial success.

The University also has a strong partnership with the Illinois Department of Commerce and Community Affairs, the State's economic development agency, and with the Illinois Development Finance Authority. For example, both are sponsors of the University's technology showcases held at the Chicago and the Urbana-Champaign campuses to expose emerging technologies to members of the private sector who are interested in learning about commercialization opportunities coming from University research.

Appendix (a): Organization for technology commercialization in the University of Illinois



Appendix (b): Staffing Plan for the UIUC Office of Technology Management

Personnel:	Current	FY 2001	FY 2002	FY 2003
Director		1(interim)	1	1
A. Director	1	1	1	1
Technology Managers				
OTM (patent, legal, business)	2	4	5	6
Unit (business, marketing)	<u>1</u>	<u>3</u>	<u>4</u>	<u>4</u>
<i>Subtotal Technology Managers</i>	<i>3</i>	<i>7</i>	<i>9</i>	<i>10</i>
Specialized Support Staff				
Information Specialist	1	1	1	1
Marketing Specialist			1	1
Compliance Specialist			1	1
Paralegal Contract drafters			1	3
Accountant	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
<i>Subtotal Specialists</i>	<i>2</i>	<i>2</i>	<i>5</i>	<i>7</i>
Secretarial	1.5	3	4	6
<i>Total Staff</i>	<i>7.5</i>	<i>14</i>	<i>20</i>	<i>25</i>

Appendix (c): Information Requested by House Resolution 308

Data current as of February 28, 2002

	Requested Information	UIUC	UIC	Total Univ. of Illinois
1	How many patents does your institution hold?	232	200	432
2	How many of these patents were gained in the last five calendar years?	86	47	133
3	How many licenses or registrations does your institution hold?	269	217	486
4	How many of these licenses or registrations were obtained in the past five calendar years?	182	106	288
5	How much revenue did the institution generate during the past five years due to its patents, licenses, or registrations?	\$23.2 million	\$8.4 million	\$31.6 million
6	How many start-up companies have your institution and/or its faculties been instrumental in forming?	28	7	35
7	If your institution has a research park, how many companies are currently housed there?	19*	30*	49*

*** The number of companies housed in the research parks includes companies in the Research Center (incubator) and the CTP at Chicago, and the companies in the University of Illinois Research Park and the Technology Commercialization Laboratory at Urbana-Champaign.**

Appendix (d): Technology Management Update

January 16, 2002

Selected Highlights

Office of Technology Management at Chicago

- In FY01
 - \$2.01 million in royalties, a 15% increase over FY00
 - \$2.01 million in royalties, a 15% increase over FY00
 - 77 new invention disclosures, a 6% increase over FY00
 - 31 new patents filed, a 16% increase over FY00
 - 10 new patents issued (FY00-08 , FY99-13, FY98-10)
 - 4 start-ups incorporated and one licensed, a 33% increase over FY00
- 3 new hires (Directors of Intellectual Property in the Colleges of: Engineering, Medicine, and Pharmacy)
- Procter & Gamble donated patents and accompanying intellectual property of its proprietary Smart Power Management (SPM) technology to UIC. As the new sole owner of the technology, UIC will benefit from all future revenues - potentially in the millions of dollars.
- VaSol Inc., a UIC-licensed technology for use in medical imaging, predictive medicine and remote diagnostics, moved into the biotech incubator in September. VaSol received its first round of financing through private investors and expects to bring its technology to market within the next six months.

Office of Technology Management at Urbana-Champaign

- In FY01
 - \$7.44 million in royalties, a 36% increase over FY00
 - 133 new invention disclosures, a 13% increase over FY00
 - 87 new patents filed, a 36% increase over FY00
 - 18 new patents issued (FY00-29, FY99-28, FY98-34)
 - 5 start-ups incorporated and licensed, a 25% increase over FY00
- 9 new hires (Director, Asst. University Counsel, Compliance Specialist, 4 Technology Managers: ACES, Beckman, Engineering, Software, 2 support staff); 6 part-time student interns hired
- BioDisplay Technologies, a UIUC-licensed virtual biotechnology company to commercialize technology that shortens the time it takes to discover various drugs that can be tested for their potential therapeutic application; acquired by Abbott Laboratories for \$7 million in Dec. 2001.
- InterSymbol Communications, Inc., a UIUC-faculty start-up, combines advanced signal processing techniques to deliver highly optimized solutions for the broadband communications market. InterSymbol has received seed round funding of \$1.9 million.
- Xindium, a UIUC-faculty start-up, which designs and develops very high-speed communication devices, circuits, and systems, has received \$5 million in seed round financing.
- Backlog Project Phase II Status:
 - 732 technologies organized by college/unit/type and assigned to technology managers in early fall 2001
 - 142 technologies submitted to D&T for assessment in early fall 2001
 - 18 assessments completed in December 2001
 - 6 active marketing → license
 - 8 return to inventor (includes one cluster of 6 related technologies)
 - 1 issue resolution
 - 3 target/internet marketing

Expected completion rate of assessments: 15-20 per month; all assessments will be completed by mid-April 2002

Appendix (e): IllinoisVENTURES, LLC Board of Managers April, 2002

External Members:

Michael J. Birck
Chairman of the Board
Tellabs
Naperville, IL

James A. Foght
Managing Director-Vector Securities
Consultant-Foght Enterprises
Winnetka, IL

Warren Holtsberg
Corporate Vice President and Director
Motorola
Schaumburg, IL

Robert Newton
Chief of Staff
Office of the Governor
Springfield, IL

William P. Tai
General Partner
Institutional Ventures Partner
Menlo Park, CA

Michael Tokarz
The Tokarz Group LLC
Purchase, NY

University of Illinois Board of Trustees Members:

Jeffrey Gindorf, M. D.
Crystal Lake, IL

Roger L. Plummer
Chicago, IL

University of Illinois Members:

David L. Chicoine
Vice President for Economic Development
and Corporate Relations
University of Illinois

Eric Gislason
Vice Chancellor for Research
University of Illinois at Chicago

Paul Bohn
Interim Vice Chancellor for Research
University of Illinois at Urbana-Champaign

Ex-officio, non-voting members:

Craig S. Bazzani -Treasurer
Vice President for Administration
University of Illinois

Thomas Bearrows-Secretary
University Counsel
University of Illinois

**James A. Weyhenmeyer-Interim CEO/
Managing Director**
Associate Vice President
University of Illinois

Executive Committee:

James A. Foght-Chair
Warren Holtsberg-Vice Chair
Dr. Jeffrey Gindorf

Appendix (f): University of Illinois Research Park, LLC Board of Managers, April 2002

External Members:

Ronald Birchall

Wheaton, IL

Sherri M. Brown

Director of Corn Technology
Monsanto
St. Louis, MO

Pam McDonough

Director
Illinois Department of Commerce
and Community Affairs
Springfield, IL

Edward L. McMillan

Edwardsville, IL

Ed Scharlau

Chairman of the Board
Busey Bank
Urbana, IL

University of Illinois Board of Trustees Members:

Jeffrey Gindorf, M.D.

Crystal Lake, IL

Kenneth Schmidt, M.D.

Riverwoods, IL

University of Illinois Members:

Paul Bohn

Interim Vice Chancellor for Research
University of Illinois at Urbana-Champaign

David Daniel

Dean, College of Engineering
University of Illinois at Urbana-Champaign

Avijit Ghosh

Dean, College of Commerce and
Business Administration
University of Illinois at Urbana-Champaign

Ex-officio, non-voting members:

Craig S. Bazzani

Vice President for Administration
University of Illinois

Thomas Bearrows-Secretary

University Counsel
University of Illinois

John B. Parks

Director
Research Park and Incubator

Michael B. Provenzano-Treasurer

Senior Associate Vice President
for Business and Finance
University of Illinois

Executive Committee:

Paul Bohn-Chair

David Daniel-Vice Chair

Pam McDonough

Appendix (g): Key Recommendations and Issues from the Report of the University Wide Facilities and Services Usage Task Force

Access:

- Provide incubator tenants with access to most university services (general and specialized).¹
- Provide broad access to specialized facilities and services to all groups of outside users, including research park tenants. *Constraints include 1) need to avoid unfair competition with local vendors¹ and 2) current University licenses or contracts based on educational use.*
- Provide incubator and research park tenant employees with identification cards for access to facilities and services at special rates.
- Share university expertise related to compliance issues (human subjects, animals, biosafety, etc.). *Constraint: reluctance of some units to provide specialized services to external users.*

Convenience & Responsiveness:

- Establish points of contact to coordinate and facilitate access for outside users:
 - Park Director (or designee) for research park/incubator tenants
 - Coordinator in OVCR for other companies
 - Negotiate/arrange/facilitate access to facilities and services
- Use approved example templates for facilities use agreements and technical testing agreements; provide consolidated billing for facilities and services through the University accounting system.
- Have campus specialists establish costs and rates for facilities and services. Establish education/training for providers on calculating rates and processing agreements.
- Standardize and automate procedures and processes as much as possible. Summarize policies, procedures, and points of contact for web site.
- Campuses finalize and implement policies and procedures.

Costing/Rates:

- Use the lower “Other Sponsored Activity Rate” to calculate the standard facilities and administrative (F&A) costs for agreements (both the technical testing agreement and facilities use agreement).
- Determine the costing of facilities and services based on a consistent definition. A recommended formula for “full costing” of services and facilities is included.

1. *General services* includes campus mail, internet, campus stores and supplies, etc. These services, if available to all outside users, could be perceived as unfair competition with local vendors. *Specialized services* such as departmental stores and shops, and technical measurement and fabrication facilities, are unique to the University and do not compete with local vendors.