
Innovation Centers

INNOV Group

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EXECUTIVE SUMMARY

Science parks, technology innovation center and various permutations of the words business, incubator, venture, research and program are all in use to describe the incubation process. Innovation Centers originated in the United States of America in 1942 and have proliferated most rapidly since then. Such Centers are programs designed to accelerate the successful development of entrepreneurial companies through an array of business support resources and services, developed and orchestrated by incubator management and offered both in the incubator and through its network or contacts.

Innovation Centers vary in the way they deliver their services, in their organizational structure, and in the types of clients they serve. Successful completion of a business incubation program increases the likelihood that a start-up company will stay in business for the long term. Among the benefits that these Innovation Centers bring, the main one is related to the fact that they create jobs and wealth to the community, fostering its entrepreneurial climate.

University researchers often face convoluted procedures with insufficient guidance to commercialize their innovations. As angel investors and venture capitalists increasingly invest in later-stage enterprises, researchers face difficulty finding early stage funding to develop and test prototypes and conduct market research. In order to fill this funding gap and accelerate the commercialization of university innovations, a new type of organization has emerged—the proof of concept center.

Today, there are about 1,200 business incubators in the United States, with its majority operating as nonprofits, supported by local governments and universities seeking to attract and retain entrepreneurial talent.

As more business incubators have been established in the U.S., a number of studies evaluating their impacts have been completed.⁶ In general, these studies examined factors like jobs created by incubator tenants and graduates, product innovation, number of new business starts, success rates of incubator firms, or impact on local development via location in the incubator service area, to measure impacts. This report identifies three different case studies for further analysis of its different impact on the society.

There is no single formula for creating a successful Innovation Center, but constant elements represent keys to success: (i) selection of a competent, dynamic management team, (ii) access to business services, (iii) business assistance at the Center site, (iv) flexible space, and (v) ability to create networks with other entrepreneurs.

1. INNOVATION CENTERS

1.1. INNOVATION CENTERS OVERVIEW

The origins of the idea can be traced to 1942, when Student Agencies Inc., in Ithaca began incubating student companies. In 1946, the first incubator outside the student community was created by American Research Development (ARD), started by several MIT alumni, to supply risk capital to entrepreneurs.

In 1959, a hardware store manager named Joseph Mancuso converted an abandoned 850,000-square-foot manufacturing complex in Batavia, N.Y., into a new kind of facility he called the Batavia Industrial Center.

Not only would tenants receive office space, they would gain access to other entrepreneurs and experts willing to dole out business advice. Several businesses soon came calling, including a winery, a charitable organization and a chicken processor. It was Mr. Mancuso who, after seeing newly hatched chicks running around the facility, began calling it an “incubator.”

Nowadays there are more than 1,200 business incubators in the United States. Most cater to a variety of businesses, according to Linda Knopp, director of policy analysis and research at the National Business Incubation Association.

Supporting such programs, most of which operate as nonprofits, has become a staple for many local governments and universities seeking to attract and retain entrepreneurial talent.

There have also been profit-making programs like Idealab, a technology incubator started by the serial entrepreneur Bill Gross in 1996 in Pasadena, Calif.

More recently, there has been a rise in so-called virtual incubators like Entrepreneur Commons and Open Coffee Club, which are really social networks that try to provide the mentoring and collaborative benefits of an incubator without the physical space.

On November 3, 2010, New York City broke ground on its sixth business incubator and the first in the Bronx called the Sunshine Bronx Business Incubator, which is a joint venture between the New York City Economic Development Corporation and Sunshine Suites.

Innovation Centers are going through a renaissance as of 2011. New experiments like Virtual Business Incubators are bringing the resources of entrepreneurship hubs like Silicon Valley to remote locations all over the world.

1.2. INDUSTRY OVERVIEW

Innovation drives economic growth. Economic growth leads to longer, healthier lives by transforming yesterday's luxuries into better, cheaper, and more efficient goods and services. University research is a key component of our nation's innovative capacity. In an increasingly dynamic and global economy, the institutional infrastructure is inefficient at moving university innovations to the marketplace.

University researchers often face convoluted procedures with insufficient guidance to commercialize their innovations. As angel investors and venture capitalists increasingly invest in later-stage enterprises, researchers face difficulty finding early stage funding to develop and test prototypes and conduct market research.

1.2.1. FILLING A NEED

Globalization has shifted the competitiveness of leading developed economies away from standardized manufacturing activities and toward knowledge-based industries and services (Friedman, 2006). As Thurow (Thurow, 2003) observes, “The world is moving from an industrial era based on natural resources into a knowledge-based era based on skill, education, and research and development.” Knowledge has emerged as a crucial source of economic growth, employment, and employment in the global economy because it is the basis for innovation. Where does the crucial resource of knowledge come from? While investments by private firms in research and development (R&D) are a crucial source of knowledge, so too are investments made in research and education at universities.

However, as Senator Birch Bayh observed some three decades ago, investments in university research do not automatically spill over to generate innovative activity and economic growth. “A wealth of scientific talent at American colleges and universities—talent responsible for the development of numerous innovative scientific breakthroughs each year—is going to waste as a result of bureaucratic red tape and illogical government regulations...”. Audretsch (Audretsch, 2007) suggests that it is the knowledge filter that stands between investment in research on the one hand, and its commercialization through innovation, leading ultimately to economic growth, on the other.

The proof of Innovation Center accelerates the commercialization of innovations out of the university and into the marketplace. It does this by providing seed funding to novel, early stage research that most often would not be funded by any other conventional source.

1.3. INNOVATION CENTER VS. RESEARCH AND TECHNOLOGY PARKS VS. U.S. SMALL BUSINESS ADMINISTRATION

Innovation Centers differ from research and technology parks in their dedication to start-up and early-stage companies. Research and technology parks, on the other hand, tend to be large-scale projects that house everything from corporate, government or university labs to very small companies. Most research and technology parks do not offer business assistance services, which are the hallmark of an Innovation Center program. However, many research and technology parks house incubation programs.

Innovation Centers also differ from the U.S. Small Business Administration's Small Business Development Centers (and similar business support programs) in that they serve only selected clients. SBDCs are required by law to offer general business assistance to any company that contacts them for help. In addition, SBDCs work with any small business at any stage of development, not only start-up companies. Many business incubation programs partner with their local SBDC to create a "one-stop shop" for entrepreneurial support.

1.4. MOST COMMON INNOVATION CENTERS SERVICES

- Help with business basics
- Networking activities
- Marketing assistance
- High-speed Internet access
- Help with accounting/financial management
- Access to bank loans, loan funds and guarantee programs

- Help with presentation skills
- Links to higher education resources
- Links to strategic partners
- Access to angel investors or venture capital
- Comprehensive business training programs
- Advisory boards and mentors
- Management team identification
- Help with business etiquette
- Technology commercialization assistance
- Help with regulatory compliance
- Intellectual property management

1.5. TYPES OF INNOVATION CENTERS

1.5.1. THE CLASSIC

PROGRAM

Classical innovation centers operate out of a shared building where tenants have subsidized rent, access to computers, office equipment, staff members and experts.

COST

Fee-based, ranging from a few hundred to a few thousand dollars a month, which covers expenses like office space, equipment rental and kitchen access.

EXIT RULES

Most programs expect tenants to “graduate” within three to five years.

EXAMPLES

Cambridge Innovation Center (Cambridge, Mass.), TechColumbus (Columbus, Ohio).

BEST FOR

First-timers or those looking to connect in new industries.

HOW IT WORKS

It is based on shared knowledge, said Tim Rowe, founder and chief executive of the Cambridge Innovation Center, which houses 300 early-stage companies in a facility owned by the Massachusetts Institute of Technology. Tenants pay from \$250 a month to \$1,100 a month per person with no limit on how long they can stay.

GRADUATES SAY

David Rose has founded two medical device companies, Ambient Devices, and Vitality, at the Cambridge center: “There is a viral energy and camaraderie. You can get a lot of good advice simply by walking into the elevator.”

USUAL QUESTIONS FROM PROSPECT TENANTS

Can you break the lease? What kinds of companies are current tenants starting? Will the incubator give you contact information for former tenants? What kinds of experiences do staff members have? Will you have contact with outside professionals?

1.5.2. THE UNIVERSITY

PROGRAM

Offers access to equipment and experienced staff.

COST

Typically free (some programs offer grants) but limited to current students or alumni.

EXIT RULES

Many programs expect the company to graduate when the student does.

EXAMPLES

ARCH New Business Incubator at the University of Chicago, Darden Center for Entrepreneurial Leadership at the University of Virginia.

BEST FOR

Student entrepreneurs looking to spend the summer or school year fleshing out an idea with the help of professors, fellow students and alumni.

HOW IT WORKS

Budding entrepreneurs at the University of Virginia’s business incubator, for example, are given a \$13,000 stipend and coaching and feedback on their business plans. Participants can also attend lectures and workshops on topics like intellectual property and accounting.

GRADUATES SAY

George Aspland, Scott Roberts and Adam Rodnitzky graduated in 2008 from the Booth School of Business at the University of Chicago. Unlike many of their classmates who turned their M.B.A.’s into jobs on Wall Street or with

big companies, they decided to start a business together and enrolled in the ARCH incubator. Within a year, their company, ReTel Technologies, had a plan to use crowd-sourcing to analyze surveillance videos. “Our time in the incubator helped us reorient and come up with a plan we could execute,” Mr. Rodnitzky said.

USUAL QUESTIONS FROM PROSPECT TENANTS

Does the program offer a stipend? What restrictions come with the money? Who are the professors and the staff members who will be advising you and what kinds of experiences do they have?

1.5.3. THE NICHE

PROGRAM

Most niche incubators offer facilities and advice at a reduced cost to companies with a specialized focus — for example, food or social entrepreneurship.

COST

Typically fee-based although some programs take equity stakes.

EXIT RULES

Must operate like the classic model

EXAMPLES

Blue Ridge Food Ventures (Asheville, NC), Sparkseed (San Francisco, CA)

BEST FOR

First-timers who require specialized instruction or access to specialized equipment.

HOW IT WORKS

First-timers who require specialized instruction or access to specialized equipment.

HOW IT WORKS

Many aspiring food entrepreneurs think they can make a few dollars selling cookies made with their grandmother’s secret recipe, said Mary Lou Surgi, executive director of Blue Ridge Food Ventures, but most do not have the equipment or the wherewithal to build a business. At Blue Ridge, they can also take classes offered by Ms. Surgi: “Most people that come here have never even thought of things like food safety or how to market and distribute their product.”

GRADUATES SAY

Jeannine Buscher and Sarah Schomber, the founders of Buchi, which makes fermented and unpasteurized tea: “We could never have afforded the kind of place we have now two years ago,” Ms. Buscher said. “It’s hard to say what kind of business we would have today if we didn’t have Blue Ridge Food Ventures to help us get started.” They started out in Ms. Buscher’s dining room but now brew their bottled beverages in a 6,000-foot-facility of their own.

USUAL QUESTIONS FROM PROSPECT TENANTS

What kinds of companies are current tenants starting? Will the incubator give you contact information for former tenants? What kinds of experiences have staff members had? Are they knowledgeable about the specific kind of business you are considering?

1.5.4. THE ACCELERATOR

PROGRAM

Most accelerators, which are run by groups of experienced business owners and investors, require entrepreneurs to move to a facility for a specified amount of time. Eventually, they are given the opportunity to market their businesses to investors.

COST

Typically a 6 percent equity stake in return for about \$18,000 in seed financing.

EXIT RULES

Programs usually last for 90 days, although companies can continue to use the program’s network of mentors.

EXAMPLES

TechStars (Boston; Boulders; Colorado; New York; Portland; Oregon), Y Combinator (San Francisco), Joystick Labs (Durham, NC)

BEST FOR

Fast-growth companies that want to attract investors

HOW IT WORKS

You get 90 days of intense focus from a team of experienced entrepreneurs and investors, said Brad Feld, co-founder of TechStars. While TechStars aims at technology companies, Y Combinator accepts a wide variety of companies. The Brandery, in Cincinnati, provides 90 days of feedback on a company’s marketing and advertising strategies. Joystick Labs accepts only entrepreneurs interested in building gaming companies.

GRADUATES SAY

Lina Chen, chief executive of Nix Hydra Games, moved from Shanghai to Raleigh to connect with smart, ambitious people at Joystick Labs. “I felt that participating in the program would save us time and money in the long run because of the kind of people who would be helping us grow our company,” Ms. Chen said.

USUAL QUESTIONS FROM PROSPECT TENANTS

How much equity do you have to give up to participate? How much investment capital do you receive in return? Who are the mentors you will be working with? How many of the program’s graduates have raised money or found a buyer? Can you contact them? Where will you live while participating in the program?

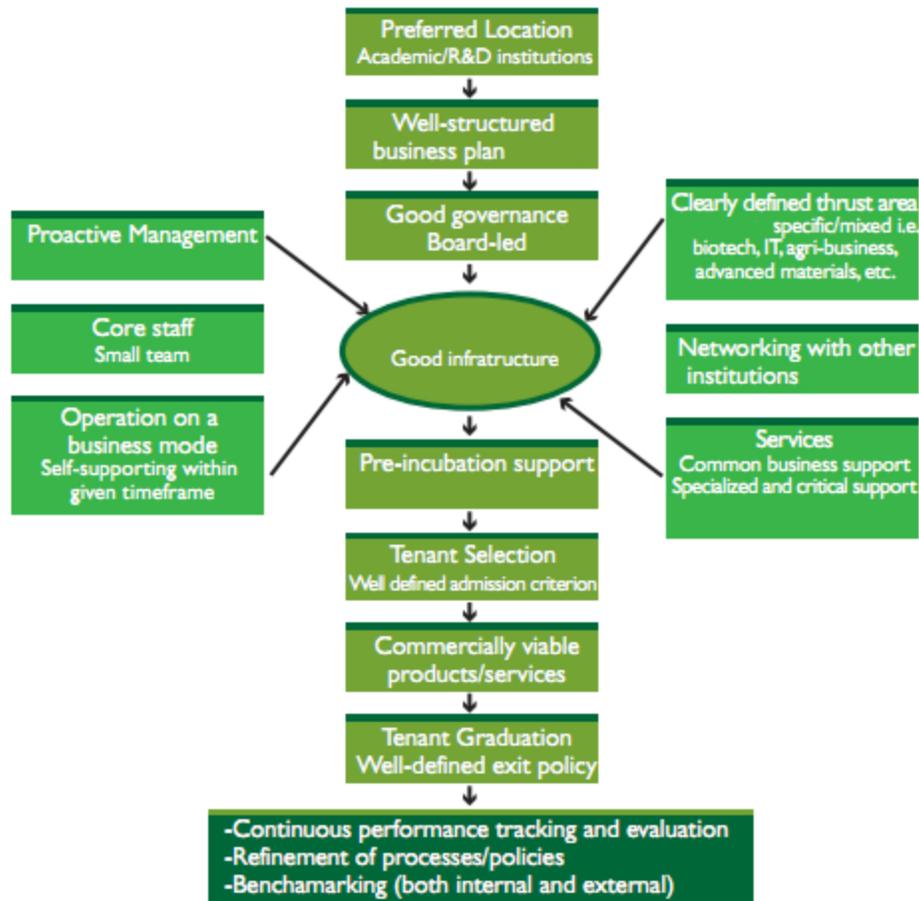
1.6. IMPACTS AND OPERATIONS - INNOVATION CENTERS

Incubators can have a positive impact on the local economy by increasing the success rate of new business ventures. These businesses, in turn, provide jobs and income and contribute to local economic diversity. The impacts of a business incubator are measured most completely by considering both direct and total impacts on the economy. This evaluation method does not compare the impacts on the community with the incubator versus without the incubator. It is difficult to determine objectively whether incubator tenant and graduate firms would have started and been successful if the incubator facility had not been available to them.

Administratively, Innovation Centers are functioning as autonomous bodies, either as a Society registered under Societies Act. 1860, or as a not-for-profit company under the provisions of Section 25 of the Companies Act. 1956.

The affairs of these Innovation Centers are managed by an Advisory Board. The Board of the Center helps not only in development of a strategic plan containing quantifiable objectives to achieve the desired results but also in managing the Center efficiently and effectively. These Board usually have representation from the promoters and reputed professionals. At times they also include representatives of different industries, VC companies, Entrepreneurs, student body and tenants of the Center. A committee is also set up for selection of tenant firms. (Annova Consulting Group, 2009)

Innovation Centers’ structures are in a “trial and error” process, hence it becomes necessary to create mechanisms that provide feedbacks from the effects and that are continuously able to select out the unsuccessful program elements, while strengthening the successful ones. Below is a operational guideline suggested by the National Business Incubator Association:



Source: Annova Consulting, 2009.
Adapted from UNESCAP (2001), *Strengthening Technology Incubation Systems for creating High Technology-Based Enterprises in Asia and the Pacific*

2. FUNDING SOURCES

About one-third of innovation centers programs are sponsored by economic development organizations. Government entities (such as cities or counties) account for 21% of program sponsors. Another 20% are sponsored by academic institutions, including two- and four-year colleges, universities, and technical colleges.

In many countries, incubation programs are funded by regional or national governments as part of an overall economic development strategy. In the United States, however, most incubation programs are independent, community-based and resourced projects. The U.S. Economic Development Administration is a frequent source of funds for developing incubation programs, but once a program is open and operational it typically receives no federal funding; few states offer centralized incubator funding. Rents and/or client fees account for 59% of incubator revenues, followed by service contracts or grants (18%) and cash operating subsidies (15%).

As part of a major effort to address the ongoing economic crisis of the US, legislation was introduced to "reconstitute Project Socrates". The updated version of Socrates supports incubators by enabling users with technology-based facts about the marketplace, competitor maneuvers, potential partners, and technology paths to achieve competitive advantage. Michael Sekora, the original creator and director of Socrates says that a key

purpose of Socrates is to assist government economic planners in addressing the economic and socioeconomic issues with unprecedented speed, efficiency and agility.

Many for-profit or "private" incubation programs were launched in the late 1990s by investors and other for-profit seeking to hatch businesses quickly and bring in big payoffs. At the time, NBIA estimated that nearly 30% of all incubation programs were for-profit ventures. In the wake of the dot-com bust, however, many of those programs closed. In NBIA's 2002 State of the Business Incubation survey, only 16% of responding incubators were for-profit programs. By the 2006 SOI, just 6% of respondents were for-profit.

Although some incubation programs (regardless of nonprofit or for-profit status) take equity in client companies, most do not. Only 25% of incubation programs report that they take equity in some or all of their clients.

3. PARTNERS



Source: UNESCAP (2001), *Strengthening Technology Incubation System for Creating High Technology-Based Enterprises in Asia and the Pacific*

4. GEOGRAPHIC AREAS

Usually Innovation Centers concentrate in areas close to Universities and Colleges, normal hub spot for young spirits and fresh ideas.

5. CASE STUDIES

As more business incubators have been established in the U.S., a number of studies evaluating their impacts have been completed. In general, these studies examined factors like jobs created by incubator tenants and graduates, product innovation, number of new business starts, success rates of incubator firms, or impact on local development via location in the incubator service area, to measure impacts.

One difficulty involved in these evaluations is that incubators have been established by both public and private entities, with different objectives. In some cases, the incubator may be linked with a job training program and designed to provide job opportunities for unemployed individuals. In other cases, the incubator may be linked with a university, providing an opportunity for product development, commercialization, and employment of highly skilled graduates. Other incubators may have restrictions on the type of firm that may enter.

The success of any incubator must be evaluated in relation to its objectives and recognizing mandated operating restrictions. Incubators have been evaluated in terms of their impact on economic development, more specifically on job creation, firm success, increase in employment and sales, and whether or not the firm locates within the local area after leaving the incubator. Allen and Weinberg (Allen & Weinberg, 1988) describe several studies of incubators created in the mid-1980s. A national study of 45 business incubators found an average success rate of almost 2:1, two successful firms for every one failure. And, 84 percent of incubator graduates remained in the local area after leaving the incubator. In a more limited study of 12 Pennsylvania incubators and 56 firms, the average two year job creation rate (1983-1984) was seven employees per incubator. These results suggest that incubators are successful in helping firms start up, but that the overall impact on the local economy in terms of direct job creation may be small, at least in the short run.

The case studies below describe incubators' operating environment and measures the direct and indirect economic impacts of the firms associated with a business incubator.

5.1. CASE A: CAMBRIDGE INNOVATION CENTER (BERNHARD, 2011)

What: Cambridge Innovation Center.

Where: One Broadway, Cambridge, Massachusetts.

When: No deadline for applications as the program is ongoing.

Who: Entrepreneurs looking to work surrounded by high-level university research in a space surrounded by other innovative companies.

Why: To gain access to other entrepreneurs working in disciplines from biotech to information technology, and to work in close quarters with venture capital firms.

How: Cost per person ranges from \$250 to \$1,100.

The Cambridge Innovation Center is different from the traditional incubators' contest and the money business model, where startups submit their business plan, hoping for a little seed capital and mentoring, then a moment in front of venture capitalists to get more funding or wash out.

Across the street from the campus at MIT, the innovation center is about the space, the products and companies it has spawned—from biotechs and clean energy to one of the most important mobile-computing platforms on the market today.

"We are a city of entrepreneurship," says Tim Rowe, director of the Innovation Center, founded in 1999 and encompassing about 150,000 square feet.

Google chose the location to develop its Android mobile-phone platform, starting with one person, and later growing to cover an entire floor of the office tower before moving into a Massachusetts office of its own.

"They wanted a place that was creative," Rowe says. So they chose a place within shouting distance of the two biggest-spending research universities in the world (between them, Harvard and MIT spend \$4 billion a year on research, Rowe said).

Companies can get space ranging from a seat at a library-style long table to desks to offices, with prices ranging from \$250 per person per month for space at a table to \$790 for a private office.

Rowe said the biggest selling point for the center is the exposure it gives entrepreneurs to one another.

With about 400 companies ranging in size from one person to 20 people and beyond, across a range of disciplines, the Innovation Center stands as a magnet for promising companies.

He said vetting of companies that want to take space at the center is relatively light, with managers of the center checking the backgrounds of would-be entrepreneurs, but without the kind of competitive business-plan battles that some other incubators demand.

"We don't seek to evaluate their business idea. Even the best venture capitalists only get that right a fraction of the time," he said.

But there have been companies with successful sales and those that have drawn serious funding from venture capitalists.

The largest exit for a company from the Innovation Center was that of Gloucester Pharmaceuticals, which sold to Celgene Corp. for \$640 million in 2009.

5.2. CASE B: THE MIDWEST INCUBATOR ENVIRONMENT (MARKLEY & MCNAMARA, 1994)

In 1994, The Midwest Incubator was established to stimulate employment and income growth in the community. In seven years of operation, the 31 incubator firms created 319 jobs with an annual payroll of \$5,905,000. As more firms graduate and provide space for new firms to enter the incubator, the impacts will continue to grow. The incubator provides a critical service to new businesses created in the community and has important positive economic and fiscal impacts on the state and local economies.

State and local policy makers must choose appropriate economic development strategies for their particular communities. To make informed choices, it is useful to compare the relative impacts of an array of development strategies. One strategy that continues to be a primary focus of most state economic development programs is industrial recruitment. It is possible, based on the impact analysis completed for the Midwest Incubator, to compare the cost of creating jobs through the incubator with the cost per job associated with the recruitment of major manufacturing plants.

While these figures cannot be generalized to all communities, the comparison does suggest how the costs of job creation through a successful incubator compare to the costs associated with the successful recruitment of a major manufacturer. This information should be useful to policy makers as they continue to allocate scarce resources among competing economic development strategies.

In a review of several industrial locations involving automobile manufacturing plants, Milward and Newman found that the cost per job created in these plants ranged from a low of \$11,000 in the Nissan plant located in Smyrna, Tennessee to a high of \$50,588 in the Subaru-Isuzu plant in Lafayette, Indiana. The cost per job created in the Midwest Incubator, over its seven years of operation, is \$6,580, considering only the 319 direct jobs created by the incubator as was done in the industrial recruitment study. If the indirect employment impacts of the incubator are included, the cost per job declines to \$4,456. It is likely that per job costs would decline if indirect jobs associated with major manufacturing locations were considered as well.

This comparison suggests that the cost of creating jobs through this incubator facility is relatively low compared with the costs associated with recruiting major manufacturers. And, it must be noted that of the thousands of communities competing for automobile manufacturing facilities in the 1980s, only six communities had the appropriate mix of factors leading to successful recruitment.

This evaluation of the Midwest Incubator provides a framework for policy makers to consider how a business incubator can function in a community, what the operating environment provides to tenant firms, and what economic and fiscal impacts can arise from the operation of firms within the incubator facility. This information should be useful to leaders at the local and state levels as they explore the role of business incubators as part of an economic development strategy.

5.3. CASE C: COMPARISON BETWEEN THE VON LIEBIG AND DESHPANDE CENTERS (GULBRANSON & AUDRESTCH, 2008)

What follows is an examination of two concept centers for innovation: the Deshpande Center at the MIT School of Engineering and the von Liebig Center at the University of California San Diego Jacobs School of Engineering. Since both centers started relatively at the same period, this analysis provides valuable insights into how proof of concept centers can facilitate the transfer of university innovations into commercial applications.

	The von Liebig Center	The Deshpande Center
Location	USCD – Jacobs School of Eng.	MIT – School of Eng.
Initial funding	\$ 10 million	\$ 17.5 million
	Gift in 2001 from William J. von Liebig Foundation	Donation in 2002 from Jaishree and Gururaj Deshpande
Budget	~\$ 1.2 million per year	~\$ 1.7 million
	<ul style="list-style-type: none"> - Adm. staff: ~\$ 475k - Grants: ~\$ 420k - Advisor's Salary: ~\$ 240k - Academic Courses: ~\$ 45k 	<ul style="list-style-type: none"> - Adm. Staff: ~\$ 320k - Grants: ~\$ 1.3M - Op. Expenses: ~\$ 80k
Amount of grants	Seed funding: \$15k – \$75k	Ignition grants: <\$ 50k Innovation grants: <\$ 250k
Total amount of grants awarded	Over \$ 2.8M	Over \$ 7M
# Proposals funded	66 Projects	64 Projects (78 Grants, 39 Ignition Grants, 39 Innovation Grants)
	<ul style="list-style-type: none"> - Approximately 11 grants per year - Approval rate of proposals: 35 – 60% 	<ul style="list-style-type: none"> - Approximately 16 grants per year - Approval rate of proposals: 18%
Time period of accepting proposals	1-2 proposal rounds per year (spring & fall)	2 proposal rounds per year (spring & fall)
Advisory services	<ul style="list-style-type: none"> - 6 Advisors work at the center approx. 1 day a week - Advisory services available to all faculty and research staff at Jacobs School independent of funding considerations 	Pool of 50 volunteers are assigned as advisors in the Catalyst Program
Networking events	<p>The “von Liebig Forum: Profiles in Innovation” – speaker series that showcases entrepreneurs, scientists, and innovators</p> <p>Open House – Informal gathering for UCSD and business community</p> <p>Community workshops – i.e. IP transfer between University and Industry</p>	<p>Idea Stream Symposium – Networking event for grant recipients, venture capitalists, entrepreneurs, and other researchers.</p> <p>Open House – Informal gathering for MIT and business community</p> <p>Catalyst Party – informal gathering of grant recipients and Catalysts.</p>

	Lunches – Award luncheon/network event	Other optional events, including Ignition Forum, joint seminars with student groups, and team-building events.
	Other events, including seminars and additional speaker/presentation events	
Educational programs	4 graduate-level courses to introduce engineering students to entrepreneurship (Venture Mechanics, Enterprise Dynamics, Applied Innovation, Corporate Entrepreneurship for Global Competitiveness)	I –Team Course – Collaboration with MIT Entrepreneurship Center that consists of teams with 3-5 science, engineering, and management graduate students evaluating the commercial feasibility of innovation research emerging from MIT research labs.
	Over 400 students and graduate students interns have enrolled in at least one of these courses.	
# of start-ups and licenses	16 Startups, 4 licenses	10 Startups, 1 License
# of employees in startups	64+	150+
Capital leverage	Spinouts have acquired over \$ 71 million in private capital	Spinouts have acquired \$ 88.7 million in private capital
Sustainability	Percentage of University royalty income from commercialization of any technologies that receive Center services	Donations from companies that have spun out
	University support and private donations, targeting \$ 10 million by 2011	Future private donations

6. KEY ELEMENTS OF INNOVATION CENTER SUCCESS

There is no single formula for creating a successful Innovation Center, but several elements are key to success. Selection of a competent, dynamic manager is critical to the successful operation of an incubator. Case studies of incubators highlight the importance of the incubator manager in attracting the right tenants, assisting the tenants as their businesses develop, and enforcing an appropriate set of operational rules for the facility. Incubator managers need to be entrepreneurs in their own right, since they are responsible for running a successful "business," the incubator itself. And the manager needs to have the business expertise required to understand problems facing a tenant, perhaps even before the tenant has identified a problem.

A related element that is key to a successful Center is access to business services and business assistance at the Center site. A true Innovation Center provides shared office support and management consulting services. Shared office support typically involves access to a copier, secretarial services, FAX machine, telephones and receptionist services with costs included in rent or on a fee-for-service basis. Tenants are able to minimize initial investment and overhead costs by utilizing these support services.

Availability of management consulting services may be the most critical contribution the Center makes to a fledgling firm's success. The Innovation Center manager or other staff member provides tenants with business counseling ranging from assistance developing a business plan to help locating sources of capital. Counseling is critical for entrepreneurs who may have good technical understanding of their business but limited business experience.

Another important factor in Innovation Center success is flexibility-flexible space, flexible rental arrangements, and flexible graduation policies. Since the birth and development of firms is not a precise science, it is important to have flexibility in Center so that firms are not forced to go it alone too early.

If space is flexible, a tenant can grow without leaving the Center. Flexible rental policies make it easier for a tenant to ride out slow growth periods and remain in business. Some Center tenants may be ready to leave the facility after a brief stay of a year, while others may need to remain for a three- to five-year period.

Again, the importance of the Innovation Center manager is key since the manager is closest to each tenant and can make appropriate decisions to encourage success.

An important benefit of locating in a Center is the opportunity to create networks with other entrepreneurs. An incubator that encourages and facilitates this networking is contributing to the potential success of both the tenants and the facility. Networking can be as formal as organized training or educational sessions where tenants come together to discuss mutual problems, or as informal as providing common space where tenants meet when collecting mail or messages from the receptionist. Tenants can share business experiences and technical advice, make valuable business contacts, and support one another as they strive to build successful firms. The Innovation Center manager can be influential encouraging networking among tenants and establishing contacts between incubator tenants and firms outside the Center. These managers may be described as a type of "gatekeeper," individuals who are committed to community development and use their contacts to encourage communication among firms. How well the manager performs this gatekeeper function is a key factor in the success of a Innovation Center.

6.1.7 COMPONENTS OF A SUCCESSFUL BUSINESS INCUBATOR (GILLOTTI & ZIEGELBAUER, 2006)

In addition to the data above, an article released in 2006 supports the idea that Innovation Centers must have in its pillars a mix of managerial skills and networking. The list below represents the 7 pillars identified as crucial to an Innovation Center success from Colin Barrow's *Incubators: A Realist's Guide to the World's New Business Accelerators*.

- Clear and Well Communicated Goals
- Incubator Manager
- Shared Resources
- Physical Space
- Financing
- Application and Acceptance Process
- Business Services
 - Business Plan Development
 - Promotional Assistance
 - Business Network

- Technical Support
- Funding for Startup and Maintenance
- Customer Service
- Hiring and Managing Employees
- Accounting and Finance

7. INCUBATORS IN MASSACHUSETTS

ANDREW M SCIBELLI ENTERPRISE CENTER - SPRINGFIELD

<http://www.stcc.edu/sec/>

ARTHUR M BLANK CENTER FOR ENTREPRENEURSHIP – BABSON PARK

<http://www.babson.edu/Academics/centers/blank-center/Pages/home.aspx>

BIOSQUARE AT BOSTON UNIVERSITY MEDICAL CENTER - BOSTON

<http://www.biosquare.org/>

BOSTON UNIVERSITY BUSINESS INCUBATOR – BOSTON

<http://www.bu.edu/otd/for-industrybusiness-incubation/>

ENTERPRISE CENTER AT SALEM STATE UNIVERSITY - SALEM

<http://www.enterprisectr.org/>

MASSACHUSETTS BIOMEDICAL INITIATIVES – WORCESTER

<http://massbiomed.org/>

MASSACHUSETTS MEDICAL DEVICE DEVELOPMENT CENTER - LOWELL

<http://www.uml.edu/m2d2/>

NORTSHORE INNOVENTURES – BEVERLY

<http://www.nsv.org/>

8. RESOURCES

<http://innovationcentre.ca/> - Canadian Innovation Centre

<http://www.nbia.org/> - National Business Incubation Association

<http://bianys.com/> - Business Incubator Association of NY State

<http://www.idisc.net/en/index.html> - InfoDev Incubator Support Center

<http://www.west.org> - West Incubator

<http://www.cictr.com/index.html> - Cambridge Innovation Center

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<http://www.portfolio.com/companies-executives/2011/07/08/cambridge-innovation-center-styles-itself-as-entrepreneurial-city/>

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