

# **BEST PRACTICES IN BUSINESS INCUBATION**

*PREPARED FOR  
THE MARYLAND TECHNOLOGY DEVELOPMENT CORPORATION (TEDCO)*

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# INTRODUCTION: BEST PRACTICES IN BUSINESS INCUBATION

## EXECUTIVE SUMMARY

Business incubators accelerate the successful development of entrepreneurial companies through an array of business support resources and services, developed or orchestrated by incubator management and offered both in the incubator and through its network of contacts. The goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator graduates have the potential to create jobs and wealth, revitalize neighborhoods, commercialize new technologies and strengthen local and national economies. An incubator must provide management guidance, technical assistance and consulting tailored to young, growing companies. Incubators usually also provide clients access to appropriate rental space and flexible leases, shared equipment, technology support and assistance in obtaining the financing necessary for company growth.<sup>1</sup>

Maryland has approximately 14 incubators and incubator-like programs currently in operation. They include programs associated with universities and community colleges, nonprofits and for-profits, operating in both urban and rural settings. Existing programs range in age from 16 years to less than a year, and they have achieved varying levels of benefit to both sponsors and clients. While the State of Maryland has funded the physical infrastructure of some of its incubators, it has no ongoing program of operating support.

Business incubators are helping build healthy, lasting businesses and they are doing it for low cost, according to an Economic Development Administration funded survey conducted in 1997. Incubator performance and return on investment vary widely, however – with the highest returns created by incubators that have been well organized, have management capable of *catalyzing* entrepreneurship in their communities and that prioritize staff time toward working proactively and in-depth with client firms. Programs that do not have staff of sufficient quality to provide high value-added assistance to entrepreneurs and who offer primarily real estate services and amenities cannot claim any significant role in client company success. At worst, these incubators may be glorified executive suites or other multi-tenant facilities that provide little more than space in which businesses can operate.

This project, *Best Practices in Business Incubation Programs*, was designed to assist in educating Maryland incubators on the highly effective practices used by other incubators – national, international and within Maryland – and to answer the need for measurable criteria against which incubator performance can be tested and future funding decisions can be made.

Project goals included:

- Compiling national and international incubation best practices to identify key practices that might be applicable to Maryland incubators
- Evaluating alternative incubation models (e.g., Internet incubators and “virtual” incubators) that might effectively support Maryland emerging technology firms

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<sup>1</sup> Adapted from the Definition of an Incubator, approved by the National Business Incubation Association Board of Directors, 1996.

- Identifying – in collaboration with Maryland’s incubators – best practices guidelines and outcome measures useful in spurring improved incubator performance

*Best Practices in Business Incubation Programs* represents the major outcome of this effort, conducted by the National Business Incubation Association in partnership with Ohio University and Claggett Wolfe Associates. The partners surveyed existing publications on incubation best practices and conducted new research in the field by examining NBIA award winners and incubators that have achieved national or international prominence. The partners found they were unable to confirm practices reported in some earlier publications due to the significant changes at these incubators in the intervening years. Thus, they found it necessary to collect considerable new data and information from current programs.

*Best Practices in Business Incubation Programs* is divided into ten chapters, each addressing a key best practice or set of best practices that can be viewed as practice domains. Each chapter provides an overview of the importance of the best practice to incubator and company success, summarizes the components of the practice and provides examples of the best practice in action – as put in use by model incubation programs. Additionally, eight incubators were chosen as representing best practice or innovative approaches in a comprehensive incubation program. These incubators are profiled in *Appendix A*. Individual practices for each of these incubators are highlighted in the appropriate chapters of the report. The eight incubators that are profiled include:

- Incubator for Technological Entrepreneurship, Kiryat Weizmann, Ness-Ziona, Israel
- Software Business Cluster, San Jose, California
- Panasonic Digital Concepts Center (PDCC), Cupertino, California
- University of California at San Diego CONNECT, San Diego, California
- Boulder Technology Incubator, Boulder and Longmont, Colorado
- Rensselaer Polytechnic Institute (RPI) Incubator Program, Troy, New York
- St. John’s Innovation Center, Cambridge, England
- ideaLabs!, Pasadena, California

As noted earlier, the ten chapters correspond to ten domains of best practice, some representing a single practice type and some representing a set of related best practices. The partners identified the following key domains and practices.

## **BUSINESS INCUBATION BEST PRACTICES**

### **DOMAIN 1: COMPREHENSIVE BUSINESS ASSISTANCE PROGRAM**

#### **Needs Assessment**

1. Develop and implement a systematic process for assessing client needs that has the flexibility to adapt to the changing environment surrounding high-growth, early-stage ventures.
2. Assess needs prior to accepting a business into the incubator and on a continual basis after it has entered the program.

### **Coaching and Facilitation**

1. Dedicate sufficient staff time to meet with clients on a regular basis.
2. Allow clients to make decisions and to complete tasks.
3. Provide oversight and support as clients use program resources.

### **Monitoring Client Progress**

1. Develop milestones designed to meet the specific goals of the client and the incubator.
2. Develop and implement a systematic process for monitoring the client's progress in meeting milestones.
3. Utilize monitoring processes to modify the services package offered to clients.
4. Utilize monitoring processes to graduate clients from the program.

## *DOMAIN 2: PROFESSIONAL INFRASTRUCTURE*

### **Know-how Network**

1. Develop a broad-based pool of individual advisors from the private and academic sectors and ensure they have the technical and business skills needed to support client businesses in various stages of their development.
2. Establish a large enough pool of advisors to minimize the impact on a specific provider, especially if services are provided on a pro-bono basis.
3. Limit exclusive arrangements with individual service providers to ensure that the appropriate services are available to meet client needs.
4. Negotiate a fee structure to minimize the financial impact on the client. (Examples include pro-bono services, services in exchange for equity and services with deferred payment until equity capital is secured.)
5. Facilitate the interaction between the service provider and the client.
6. Screen service providers and establish a feedback mechanism to assess client progress and satisfaction.

### **Mentors**

1. Develop a pool of volunteers willing to serve as mentors for clients. Mentors should have been involved in actual business operations in the appropriate industries at various stages of the development process from proof-of-concept to Initial Public Offering and/or acquisition.
2. Ensure that mentors meet with clients according to a regular schedule.

3. Meet with mentors periodically to monitor client progress and identify additional needs.
4. Screen mentors and establish a feedback mechanism to assess client satisfaction.

### **Advisory Boards**

1. Develop a pool of professionals, technologists, business owners, etc., willing to volunteer their services as advisory board members for clients. Individuals should have experience in the appropriate industries at various stages of the development process from proof-of-concept to Initial Public Offering and/or acquisition.
2. Ensure that advisory boards meet with clients according to a regular schedule.
3. Meet with advisory boards periodically to monitor client progress and identify additional needs.
4. Screen advisory board members and establish a feedback mechanism to assess client satisfaction.

### *DOMAIN 3: CLIENT CAPITALIZATION AND FINANCING*

1. Provide access to debt and equity capital to launch and sustain the growth of clients and train clients on requirements for obtaining financing.
2. Establish linkages with “angel,” venture capital and corporate equity investors through capital networks, brokers and personal contacts.
3. Consider creating in-house equity and debt funds to seed a deal and to fill financing gaps.
4. Create relationships with corporations that are willing to provide services (e.g., product development, manufacturing, sales and distribution, etc.) for clients in the incubator in lieu of capital.

### *DOMAIN 4: CLIENT NETWORKING*

1. Proactively encourage client networking to establish and sustain the incubator’s nurturing environment.
2. Pay attention to facility design issues, host brown-bag lunches, CEO roundtables and affiliates programs to bring business owners together to exchange ideas, share experiences and leverage resources.
3. Hire incubator management that values client interaction and networking and is capable of facilitating these processes.

### *DOMAIN 5: TECHNOLOGY LICENSING AND COMMERCIALIZATION*

1. Develop partnerships with technologists and technology transfer offices with the principal objective of commercializing technology through new company formation.

2. Manage conflicts between all parties; offer incentives for commercialization and work to change potentially incompatible cultures to become more responsive.
3. Establish a seamless interface between the incubator and the technology generator to ensure fast and effective commercialization.

#### *DOMAIN 6: UNIVERSITY AND FEDERAL LABORATORY LINKAGES*

1. Establish linkages with universities and federal laboratories to leverage the valuable assets these entities can provide to incubator clients.
2. Use these linkages to provide clients with faculty/technologist consulting services, student interns and employees, access to technical facilities and equipment, databases, researchers and R&D financing.
3. Ensure that partnerships and linkages provide value to all parties.

#### *DOMAIN 7: FACILITY BASICS*

1. Ensure flexible space and the necessary amenities (e.g., high-speed communications, parking, security, etc.) to meet the needs of different clients at various stages of their development.
2. Encourage client interaction through the use of common meeting areas (e.g., kitchens, mail rooms, copy rooms, etc.).
3. Provide sufficient leasable space for the incubator to reach financial sustainability.

#### *DOMAIN 8: GOVERNANCE AND STAFFING*

1. Ensure that the incubator has an effective governing body including private-sector perspectives.
2. Achieve consensus among staff and major stakeholders on the mission of the incubator.
3. Ensure that the incubator's president/CEO has appropriate skills and is capable of helping companies grow.
4. Ensure that staffing is sufficient, that certain staff is designated to work primarily and directly with client services and that those people have the highest qualifications.
5. Hire entrepreneurial presidents/executive directors capable of identifying client needs and matching them with a wide range of resources, and ensure they do this without impeding the client's need to learn or diminishing the client's responsibility for growing a business.

#### *DOMAIN 9: CLIENT SCREENING AND GRADUATION*

1. Utilize an extensive screening process to select clients that can benefit from the value-added services the incubator provides.
2. Ensure that screening processes determine the needs of the applicant, the ability of the incubator to provide value to the applicant and the willingness of the applicant to accept the value provided by the incubator.
3. Establish appropriate graduation criteria.

*DOMAIN 10: INCUBATOR EVALUATION*

1. Utilize a range of quantitative and qualitative measures to evaluate performance relative to the incubator's mission.
2. Obtain client feedback on the value of the program while they are residents and following graduation.
3. Ensure evaluation processes are both manageable and consistent and that outcomes are used to improve incubator performance.



# CHAPTER 1: COMPREHENSIVE BUSINESS assistance programs

## *overview*

The value-added services that characterize a successful incubator program are broad, as evidenced by the number and diversity of the topics addressed in the chapters of this guide. However, the ability to coalesce these services into a comprehensive business assistance program designed to successfully nurture emerging ventures must be the ultimate objective of a best practices incubator. Such a program should follow a logical progression of steps as described below.

**Needs Identification** – Identifying client needs is an on-going process. At the onset, an incubator must clarify the needs of applicants to determine whether the services offered by the incubator can provide sufficient value to adequately fulfill these needs and, thus, justify their admission into the program. Once admitted, the incubator must continually assess the needs of its clients on a pro-active basis to address the ever-changing environment faced by emerging technology ventures. Early in the process this may consist of daily meetings with the management team. As the management team matures, this may diminish to semi-monthly or monthly meetings, but pick up once again if the venture works to secure equity capital. Regardless of the situation, needs identification provides the platform from which an incubator can take action to assist its client.

### **Role in Supporting a Successful Incubator Program**

- Provides a benchmark for screening new applicants
  - Is the venture ready for incubation or should they be referred to other programs (e.g., business counseling, education, etc.)?
  - Does the incubator have adequate value-added services to fulfill the needs of the applicant?
- Clarifies actions to be taken and resources to be mobilized by clients as well as incubator staff during coaching and facilitation activities

**Coaching and Facilitation** – Coaching and facilitation are logical extensions of needs identification, and ultimately serve as vehicles for continuing the process. The true value of coaching and facilitation comes when the incubator's staff can facilitate the use of specialized resources or instruct the client on how to do something in such a manner that they can then complete the task themselves. This is different than serving as referral sources in that the incubator's staff must engage in the process through its entirety to ensure that the desired outcomes are attained. Other aspects of coaching and facilitation include serving as a sounding board and cheerleader for client businesses as they face the many challenges associated with starting a new venture, and continuing to identify needs before issues become urgent or problematic. In fulfilling this role, the incubator staff must walk a fine line between coaching someone through an issue and solving it for them. Staff must resist the temptation to

complete tasks for clients because this can undermine the entrepreneur’s ownership of the business and diminish the entrepreneurial spirit and drive needed to successfully launch a new venture.<sup>2</sup>

**Role in Supporting a Successful Incubator Program**

- Provides clients with an outside perspective of their business, and allows for strategic thinking that might be neglected due to the pressures of dealing with the daily operation of the business
- Provides a mechanism for continually assessing and fulfilling needs
- Provides for the timely mobilizing of resources
- Provides support and oversight to ensure that the full benefit is derived from each resource

**Monitoring Client Progress** – Monitoring client progress can easily be overlooked when responding to the specific needs that arise on a daily, weekly or monthly basis. Consequently, the incubator’s staff must periodically take a step back to objectively evaluate a client’s progress through the incubation program and whether it is likely to graduate from the incubator. Progress can be measured in terms of specific milestones that reflect the evolution of a new venture as well as the mission of the incubator. Specific accomplishments such as completing/refining the business plan, solidifying the management team, completing the “proof of concept,” securing capital, establishing strategic partnerships, graduating from the incubator, etc. all serve as examples of specific milestones for tracking the progress of a client through an incubation program.

**Role in Supporting a Successful Incubator Program**

- Provides focus to both client and incubator actions, thus ensuring that the goals of the client and the incubator are attained
- Ensures that the client is committed to launching the venture and graduating from the incubator

By properly executing each of these steps, an incubator can increase the success rate of its clients as well as solidify its position in supporting the formation and growth of new ventures. The figure below provides a summary of the best practices associated with a comprehensive business assistance program. These practices are further highlighted in the section entitled Best Practices in Action.

**TABLE 1.1: Summary of Best Practices  
Comprehensive Business Assistance Program**

**Needs Assessment**

1. Develop and implement a systematic process for assessing needs that has the flexibility to adapt to the changing environment surrounding high-growth, early-stage ventures.

<sup>2</sup> Chuck Wolfe, et al., *Technology Innovation Centers: A Guide to Principles and Best Practices*, California Office of Strategic Technology, December 1999, p. 20.

2. Assess needs prior to accepting a business into the incubator and on a continual basis after it has entered the program.

### **Coaching and Facilitation**

1. Dedicate sufficient staff time to meet with clients on a regular basis.
2. Allow clients to make decisions and to complete tasks.
3. Provide oversight and support as the client uses program resources.

### **Monitoring Client Progress**

1. Develop milestones designed to meet the specific goals of the client and the incubator.
2. Develop and implement a systematic process for monitoring the client's progress in meeting milestones.
3. Utilize monitoring processes to modify the services package offered to clients.
4. Utilize monitoring processes to graduate clients from the program.

### *Best Practices in Action*

#### *Software Business Cluster, San Jose, California*

Practices Highlighted: *Needs Identification*

*Coaching and Facilitation*

The SBC assesses the needs of its clients on a continuous basis during their stay in the incubator. Initial, basic needs are assessed during the application and screening process (see Chapter 9: Client Screening and Graduation). Once the business becomes a client of the SBC the executive director and/or managing director meet with the business regularly so that at any given time they have a list of three to five priority items identified by the client. When the client first enters the SBC these meetings may occur daily, but once the company gets settled the meetings can occur as infrequently as every two weeks or once a month. When the client is ready to begin the process of securing funding or is negotiating to be acquired, these meetings may again occur on a daily basis. The SBC does not use a formal needs assessment process, but has adopted a more flexible approach to assisting clients by maintaining regular contact and prioritizing items on an ongoing basis. Throughout this process, the executive director and/or managing director providing coaching to the client and facilitate the use of SBC resources such as the Executive Associates Program and the Venture Capital Referral Program, and they link clients to appropriate outside professionals, university professors, etc. to address specific business and technical needs.

(Source: National Business Incubation Association Randall Whaley Incubator of the Year Award Application, 2000, and conversations with James Robbins, Software Business Cluster Director, May 2000.)

*Boulder Technology Incubator (BTI), Boulder and Longmont, Colorado*  
Practices Highlighted: *Needs Identification*  
*Coaching and Facilitation*

The Boulder Technology Incubator (BTI) has developed a seven-step process, the Entrepreneur Success Model, to provide its clients with a comprehensive business assistance program. The selected client firms work with several advisory boards developed for the company as it moves through each step. The steps take the firm through an initial screening process, market and organizational development, and right on to preparing a presentation to investors. Qualified, technology based start-up companies with a good start on a business plan are invited to take a look at the incubation program. Potential firms are evaluated extensively in four areas including technology, business, principals/directors, and factors such as community benefit/awareness and ecological benefit. The incubator program provides support in the areas of business planning, management development, an advisory team customized to the business's needs, executive suite services, assistance in finding financing and access to other entrepreneurs.

The Entrepreneur Success Model is a comprehensive, flexible approach, providing assistance in a customized format that can be used for companies at any early stage of development, regardless of the entrepreneur's experience. The seven-step process utilizes advisory groups that move the company through the stages of the model; these groups evolve to meet the client's needs and serve as an ongoing advisory board. Some companies may skip a stage if they are mature in that particular area:

**INITIAL SCREENING**

Conducted by management with companies expressing initial interest in the incubator, this process culls out anyone who would not be a match for the incubator's resources and company mix.

**ADMISSIONS COMMITTEE**

Composed of members suited to assess each particular company, this committee takes a hard look at the business plan, the entrepreneur's resources, goals, sales and other characteristics and shepherds the company through the entire Entrepreneur Success Model program. Each client is also appointed its very own advisory board, tailor-made from the BTI's large advisory pool.

**PRODUCT DEVELOPMENT**

The advisory board works with the company to analyze, improve and further develop its product or service.

**MARKET DEVELOPMENT**

The advisory board helps the company hone its marketing analysis and marketing strategies.

**ORGANIZATIONAL DEVELOPMENT**

The advisory board helps the company develop its management team, corporate structure and board of advisors.

### **FINANCIAL DEVELOPMENT**

The advisory board examines all cash flow statements, pro formas, business valuation and financial assumptions.

### **CLIENT FUNDING**

The advisory board determines if the company is ready for its initial capital investment. The team here consists of experienced investors who prepare the company for the due diligence process.

(Sources: Adapted from Gibson, Andrea, “No Substitute for Good Advice – At Boulder Technology Incubator, Custom-Made Teams Are Key,” *NBIA Review*, vol. 15, no. 1 (February 1999), pp. 6-9, 16; *Business Incubation – Building Companies, Jobs & Wealth*, edited by Sally Hayhow, National Business Incubation Association, Athens, Ohio, 1997, p. 15.)

*University of San Diego CONNECT, San Diego, California*  
Practices Highlighted: *Coaching and Facilitation*

University of San Diego CONNECT’s Springboard Program was started to assist high technology and biotechnology entrepreneurs who are in the very early stages of developing a concept and strategy for a business. Upon acceptance into the Springboard program, the entrepreneurs spend four to eight weeks in coaching sessions with experienced business people to help them develop their business opportunities. Upon completion of the program, the entrepreneur is invited to make a presentation of his or her idea to a select group of CONNECT sponsors and members. This group will usually include a venture capitalist, accountant, corporate and patent attorneys, marketing professional and an executive from a successful company in the same industry. Experts will also be drawn from insurance, real estate, human resources and other areas as needed. The goals of the one-and-a-half-hour Springboard meetings are to provide the entrepreneur with candid recommendations for the development of their business plan or concept and to help define the desired outcome of their efforts.

(Source: UCSD CONNECT Website at <http://www.connect.org/>, April 2000.)

*Arizona Technology Incubator, Scottsdale, Arizona*  
Practices Highlighted: *Monitoring Client Progress*  
*Coaching and Facilitation*

The Arizona Technology Incubator’s advisory board program<sup>3</sup> was started to provide high-quality service to clients and to ensure client and incubator success. Individual company advisory boards are brought into operation following an initial client-training workshop. All ATI clients are

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<sup>3</sup> ATI’s Advisory Board Program received the 1997 National Business Incubation Association’s Innovation Award, sponsored by the Ewing Marion Kauffman Foundation.

required to attend the two-and-a-half-day workshops conducted by Management Action Programs, Inc., which focuses on issues such as self-appraisal, growth goals, growth strategies, action steps, progress and corrective strategies. Highly trained instructors run these workshops. During the workshop the tenants develop steps that they need to accomplish in order to become successful.

Once the workshop has been completed, ATI appoints an advisory board to meet with each client. The advisory board is made up of five to eight people with different functional backgrounds. The incubator manager attempts to identify one marketing person with experience in the firm's industry, finance, legal and accounting persons. Advisers are all volunteers, some retired and some still employed. The process of picking each company's advisory board is carefully executed to ensure diversity and chemistry among board members. In addition, board members are matched with companies on the basis of similar industry experience whenever possible.

The client company CEO and the advisory team select five critical goals the incubator company must achieve. The team then meets monthly to monitor the company's progress towards those goals. These meetings encourage the entrepreneur to think about what he/she needs in the area of business assistance and encourage discipline with regard to the business plan and its execution. If the company is not meeting goals, its advisory board will help devise a plan to help achieve those goals. In two cases a member of the advisory board has invested in a company and became its CEO/President.

(Source: Conversations with Sandy Hunter, Arizona Technology Incubator Assistant to the CEO, May 2000.)

*Incubator for Technological Entrepreneurship at Kiryat Weizmann (ITEK), Ness-Ziona Practices Highlighted: Monitoring Client Progress*

As with other incubators sponsored by the Israeli Ministry of Trade and Industry (the Incubators Authority of the Chief Scientist's Office), ITEK's clients face milestones imposed by the Incubators Authority. These milestones are derived from the techno-scientific-business review performed by an expert appointed by the Office of the Chief Scientist. The resulting milestones are mandatory, and may be technical achievements, recruiting specific manpower or starting a strategic activity, for example. Each milestone is associated with a date for completion, which may be changed if justified. A request for revising milestone dates is made to the incubator manager, who constantly follows up on each project.

Additionally, ITEK clients must meet voluntary milestones set by the project management for each company. Normally these are of a technical character. The incubator-appointed project manager and the incubator manager review them internally. In some cases the incubator's R&D Committee is requested to participate in an assessment. Voluntary milestones are reviewed during the regular meetings between the project manager and the incubator manager, either at a regularly scheduled meeting or at a meeting called on as as-needed basis.

(Source: Correspondence with Shmuel Yerushalmi, ITEK Incubator Manager, May and June 2000.)

## chapter 2: professional infrastructure

### overview

A comprehensive business assistance program is only as strong as its component parts. Needs identification defines the direction, coaching and facilitation provides the process and client monitoring measures the outcomes. However, the strength and diversity of the resource pool supporting the program will ultimately influence the integrity of the incubator, as well as the subsequent value it provides to clients. A key element of this resource pool is professional infrastructure, which is described in this chapter.

Professional infrastructure is comprised of three basic resources.

**Know-how Network** - The *know-how network*,<sup>4</sup> or professional services network, is a collection of experts from the region served by the incubator who are willing to provide services to the incubator's clients at no cost or at reduced rates. These networks typically consist of senior level accountants, attorneys, marketing specialists, venture capitalists, professors, technology specialists and others who have chosen for one reason or another to support new ventures. These individuals are not typically available to early-stage ventures and, thus, the value of the incubator is its ability to make these valuable individuals available to its client. It is important to understand that not every individual in these broad groups can provide value to the network. Consequently, an incubator should focus on developing a pool of individuals who are recognized as experts in the particular areas represented by the incubator's clients (e.g., communications technology, information technology, biotechnology, etc.). The process of attracting these individuals may take time, but it will become easier once the incubator has established its own identity as a valuable source of support for successful ventures.

The term *enlightened self interest* (or value to the participant) has been used by many incubator operators to explain why they have been able to obtain the services of such talented individuals at cost-effective rates. Some participate for the opportunity to obtain new, potentially lucrative clients or to identify investment opportunities, while others participate for the public relations benefits or the desire to give something back to the community. Regardless of the reason, acknowledging and managing the value to these participants will be as important to the incubator as it will be to the client businesses it serves, because without them, the value of the incubator to new ventures diminishes significantly.<sup>5</sup>

### Role in Supporting a Successful Incubator Program

- Opens doors to experts not typically accessible by early-stage ventures

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<sup>4</sup> Mark P. Rice, et al., *Growing New Ventures: Creating New Jobs* (Westport, Connecticut: Quorum Books, 1995) p. xxi.

<sup>5</sup> Wolfe, p. 21.

- Expands the range of technical and professional expertise available to incubator clients
- Expands the number of stakeholders interested in supporting the incubator

**Mentors** – During the period of time a client is involved with an incubator, there will be numerous instances in which they can benefit from interacting with someone who has been successful in launching a new venture and has been in similar circumstances to theirs. Although some may feel that the incubator’s staff can provide this support through its business coaching services, staff time is typically in short supply, and an outside, third-party perspective can enhance the effectiveness of the guidance provided by in-house staff. Consequently, mentors provide additional value to incubator clients. Typical mentoring programs draw on a pool of experienced entrepreneurs—even incubator graduates—who have been successful with their own ventures and who wish to share this experience with others. The one-on-one nature of this interaction allows the mentor to become more familiar with the intricacies of the client’s business operations at a level that may not be feasible for advisory board members or incubator staff. Mentors also provide clients with what they may perceive as a more realistic approach to handling an issue or to making a business decision.<sup>6</sup> As with business coaches, mentors risk undermining the entrepreneurial spirit if they take ownership of the business concept away from the founders. This may be less of a risk if the mentor takes a more active role in the business as an investor and/or board member, but the risk still exists, and an incubator should work with its mentors to mitigate this problem.<sup>7</sup> A detailed article on incubator mentoring programs is included in *Appendix B1*.

#### **Role in Supporting a Successful Incubator Program**

- Provides clients with access to individuals with practical, real world experience in dealing with the formation and growth of a new venture
- Expands the number of stakeholders interested in supporting the incubator

**Advisory Boards** – During the early stages of development, many new ventures lack an effective board of directors. Consequently, an incubator can provide value by assisting with the formation of a temporary advisory or “shadow” board to serve in this function until a formal board of directors is established. Advisory boards can be a good, early substitute for a board with the advantage of being easier to recruit (no fiduciary responsibility), and being better timed for entrepreneurs that have yet to establish a corporate structure. The advisory board should be comprised of volunteers with the range of expertise needed by the client. The composition of this board may change over time as the business progresses through its various stages of development, but steps should be taken to obtain a commitment from a core group of these volunteers to provide continuity within the board over time. Another important consideration when developing an advisory board is conflict of interest. The

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<sup>6</sup> Louis G. Tornatzky, et al., *The Art & Craft of Technology Business Incubation* (Athens, Ohio: NBIA Press, 1996), p. 65.

<sup>7</sup> Wolfe, p. 21.

incubator should address intellectual property concerns, product positioning and other issues before it provides this service.<sup>8</sup>

**Role in Supporting a Successful Incubator Program**

- Provides clients with an organizational framework for building the business early in the development process
- Expands the number of stakeholders interested in supporting the incubator

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<sup>8</sup> Ibid., p. 22.

**Table 2.1 Summary of Best Practices  
Professional Infrastructure**

**Know-how Network**

1. Develop a broad-based pool of individual advisors from the private and academic sectors and ensure they have the technical and business skills needed to support client businesses in various stages of their development.
2. Establish a large enough pool of advisors to minimize the impact on a specific provider, especially if services are provided on a pro-bono basis.  
Limit exclusive arrangements with individual service providers to ensure that the appropriate services are available to meet client needs.
3. Limit exclusive arrangements with individual service providers to ensure that the appropriate services are available to meet client needs.
4. Negotiate a fee structure to minimize the financial impact on the client. (Examples include pro-bono services, services in exchange for equity and services with deferred payment until equity capital is secured.)
5. Facilitate the interaction between the service provider and the client.
6. Screen service providers and establish a feedback mechanism to assess client progress and satisfaction.

**Mentors**

1. Develop a pool of volunteers willing to serve as mentors for clients. Mentors should have been involved in actual business operations in the appropriate industries at various stages of the development process from proof-of-concept to Initial Public Offering and/or acquisition.
2. Ensure that mentors meet with clients according to a regular schedule.
3. Meet with mentors periodically to monitor client progress and identify additional needs.
4. Screen mentors and establish a feedback mechanism to assess client satisfaction.

**Advisory Boards**

1. Develop a pool of professionals, technologists, business owners, etc., willing to volunteer their services as advisory board members for clients. Individuals should have experience in the appropriate industries at various stages of the development process from proof-of-concept to Initial Public Offering and/or acquisition.
2. Ensure that advisory boards meet with clients according to a regular schedule.
3. Meet with advisory boards periodically to monitor client progress and identify additional needs.
4. Screen advisory board members and establish a feedback mechanism to assess client satisfaction.

## **BEST PRACTICES IN ACTION**

*Rensselaer Polytechnic Incubator Program, Troy, New York*

*Best Practices Highlighted: Know-how Network*

*University and Federal Laboratory Linkages*

The strong partnership between Rensselaer Polytechnic Institute (RPI) and its incubator is probably the most distinguishing attribute of the incubator. One very successful way in which this partnership is manifested is in the involvement of RPI's students with incubator companies. Every MBA student is required to perform a field project with a company. In addition, at least eight other elective courses are based on students performing field projects, most frequently with incubator companies. The students may help rewrite business plans, develop marketing plans, perform specific marketing research projects, create advertising plans, develop cost accounting and financial reporting systems, write technical brochures or manuals, develop financing plans and prepare financing applications, etc. While the students are most often graduate students from the Lally School of Management, students from science, engineering and humanities schools also participate. The incubator's clients benefit from a free consulting project performed by students who often have substantial prior work experience. Surveys have shown that the companies feel these projects would have been worth an average of \$3,000 to \$5,000 if professional consultants had performed them. At the same time, the students rate the courses that require field projects as one of the most valuable learning experiences they receive at RPI.

In one example, a team of students helped an incubator affiliate evaluate the potential for exporting their automation equipment to the Pacific Rim. The company wanted to know if their equipment would sell in the Pacific Rim and, if so, which distribution method was most appropriate and which Pacific Rim country would be the best target for initial entry into that region of the world. In the MBA course *Technological Entrepreneurship* a team of students was formed that included Taiwanese, Korean and American students. The students performed a thorough market analysis using traditional secondary sources, but also leveraged the international composition of the team to contact potential customers, manufacturers representatives and distributors in the Pacific Rim countries. They analyzed the cost of various distribution methods as well as cultural and legal factors for an American firm doing business in each country. They concluded that there was an attractive market for the incubator affiliate's equipment, that Taiwan was the most appropriate and attractive market for initial entry, that using a manufacturers representative was the most effective means for distribution, and even identified and initiated discussions with a specific representative who was very familiar with the particular type of equipment sold by the incubator affiliate. The cost of this project to the incubator firm was less than \$200, mostly for long distance phone charges, while the value of the project was many thousands of dollars.

In addition to utilizing students to conduct research for clients, RPI's Incubator Program organizes "Consulting Desks." This involves professional business service providers visiting the incubator for one day each month to consult with clients at no cost.

Pricewaterhouse Coopers, the big five accounting and business advisory services firm, a human resources company, and a law firm specializing in general legal issues currently participate, and incubator Director Bela Musits is negotiating to add a law firm that specializes in intellectual property issues. Clients may sign up in advance for a one hour consultation, and the incubator schedules the visits and notifies the professionals of the companies and issues they'll be addressing. In some cases, Musits may forward a financial statement or other document for the professionals to review in advance. The incubator also provides the office space for consultations. Since the program began operation in the fall of 1999, every consultation session has "sold out," according to Musits.

(Sources: Glenn Doell, National Business Incubation Association Randall Whaley Memorial Incubator of the Year Award Application, 1995; telephone conversation with RPI Incubator Program Director Bela Musits, June 2000.)

*Software Business Cluster, San Jose, California*  
Practices Highlighted: *Know-how Network*

The SBC has established an extensive network of professionals (or know-how network) through its board of directors, partners and sponsors. This network consists of senior level professionals and technologists from around Silicon Valley with specific expertise in the software/Internet industry. Representatives include partners at law firms, accounting firms and consulting firms who have agreed to work with SBC clients on a deferred billing basis (until the company secures financing) or for equity in lieu of payment. Use of the network is facilitated by the executive director and/or managing director on an as needed basis in response to the three to five priority items identified by the client.

The SBC also has a more structured program known as the Executive Associates Program, which has been designed to ensure that the SBC has a diverse pool of resources to meet the varying needs of the SBC's clients at different stages in their development. The program consists of 15 to 20 volunteer mentors/coaches who have been pre-screened by the SBC. When asked to assist a client, these individuals contribute three to four hours per week on a pro bono basis to provide business or marketing advice, make referrals, serve as a temporary board members, etc. The pool of volunteers is rotated periodically to minimize the time demands on any one individual and to ensure that the skills reflect the changing needs of SBC clients.

(Source: National Business Incubation Association Randall Whaley Incubator of the Year Award Application, 2000, and conversations with James Robbins, Software Business Cluster Director, May 2000.)

*Long Island High Technology Incubator, State University of New York at Stonybrook, New York*  
Practices Highlighted: *Know-how Network*

The Shared Service Providers program gives incubator clients access to extremely valuable (and affordable) professional services. Selected professional business service company representatives

work with the incubator clients in-house, utilizing a 250 square foot shared office set aside for this purpose by the incubator. Each of the service providers pays an annual fee of \$4,000 – basically a license agreement (*see Appendix B2*) for use of the space – for the privilege of meeting with and assisting client firms. Initial meetings are on a pro-bono or a reduced rate basis with ongoing terms and conditions specified thereafter. Companies often establish relationships with more than one of the providers. In addition to advising the companies and assisting in preparation of financial reports, etc., the providers also make referrals for more specific and special needs for each business. The service program currently includes three legal firms that specialize in intellectual property. However, in the past it has also included venture capital and accounting firms. The amount of time the service providers spend in the office space varies, but the contact person for each service firm is well known to each client firm's staff. Appointments are both walk-in and scheduled in advance. The incubator attempts to ensure that service providers are familiar with incubator activities and clients.

The program has evolved since it was instituted. For example, it was sometimes difficult to get clients to participate in programs that were offered by providers. Now, the incubator has implemented a point system in which clients receive a specific number of points for attending seminars. When a certain number of points have been accumulated, the client receives a reward, such a free parking pass. Long Island has no dearth of experienced, high-quality business service providers. Typically, the provider has approached the incubator to offer its services. Many big firms with solid reputations for excellence have assisted incubator clients through the program.

(Source: Conversation with Jim Finkel, Associate Director, Long Island High Technology Incubator, May 2000.)

*Technology Advancement Program (TAP), University of Maryland, College Park, Maryland*

Practices Highlighted: *Mentors*

Affiliated companies have access to the Michael D. Dingman Center for Entrepreneurship's New Venture Mentoring and Management Counseling Program. TAP companies are subsidized in their use of the Dingman Center services such as seminars, luncheons and mentoring. In addition, TAP subsidizes the Dingman Center program fee for its companies. The program has more than 150 volunteer mentors, including faculty members, entrepreneurs and professionals in accounting, compensation staffing, financing/financial planning, government contracting, international business, joint venturing, law, marketing/sales and strategic planning. The mentors also provide introductions to business contacts, give advice and focus start-up businesses on key problems they are facing. TAP has its own mentors as well, which include law firms representatives, business consultants and accountants. TAP clients can either use the mentors through the Dingman Center or through TAP. Dingman offers a greater variety of specialized business technical services, while TAP provides quick consultations related to intellectual property or accounting matters.

(Source: Conversations with Ed Sybert, Technology Advancement Program Director, May 2000.)

*Arizona Technology Incubator, Scottsdale, Arizona*

Practices Highlighted: *Advisory (Shadow) Boards*

Each Arizona Technology Incubator (ATI) firm is assigned an advisory board. The incubator has a pool of 25-30 volunteers who have agreed to advise these new firms. The volunteers are selected by the incubator manager and made up of corporate attorneys, engineers, entrepreneurs, bankers and corporate managers. From this pool five to eight people with different functional backgrounds are selected to serve on each client's advisory board. The incubator manager attempts to identify one marketing person from the firm's industry, as well as experts in finance, law and accounting. Advisers are all volunteers – some are retired and some still employed.

The process of picking each company's advisory board is carefully executed to ensure diversity and chemistry among board members. In addition, board members are matched with companies on the basis of similar industry experience whenever possible. The board meets with the client firm management once a month, advising companies on strategic direction much like a public corporation board of directors.

(Source: Conversations with Sandy Hunter, Arizona Technology Incubator Assistant to the CEO, May 2000.)

*Incubator for Technological Entrepreneurship (ITEK) at Kiryat Weizmann, Ness-Ziona, Israel*

Practices Highlighted: *Advisory Boards*

A board of directors is created for each new company during the incubation period, and the incubator contributes two to three individuals, including the incubator manager, to this board. Others appointed by the ITEK board of directors to the client company board include individuals selected according to the character of each firm – sometimes scientists and sometimes business people. This board becomes the legal board of the company, and thus it is a *governing rather than advisory board*. At the end of the incubation period, this board is replaced by the choices of the company stockholders. At that time, a dilution process has already taken place following rounds of investments, which naturally influences the balance of power in each company. In cases in which the incubator is not heavily diluted, it may hold one seat on the new board. The client company's board meets as often as necessary, from one to two times a year up to five or six times, depending on the decisions that need to be taken in regard to investments, financial matters, modifying the development plan, etc.

As noted in an earlier chapter, each company is also assigned a business manager by the incubator – in most cases independent experts or individuals appointed by their business consulting companies. The incubator maintains a pool of such individuals, either known from previous experience or recommended by others. The incubator manager meets with potential client business managers to assess whether there would be a fit between the firm and the expert, both on professional and personal grounds. Occasionally, the incubator must replace the business manager because of a poor fit.

The incubator also has an R&D Committee that meets as frequently as necessary – normally with two weeks advance notice. Four to five such meetings are typically held a year to consider client company technology issues. Open channels of communications are maintained throughout the year.

(Source: Correspondence with Shmuel Yerushalmi, Incubator Manager, May and June 2000.)

*Boulder Technology Incubator, Boulder and Longmont, Colorado*

BEST PRACTICES HIGHLIGHTED: *ADVISORY BOARDS*

*CLIENT SCREENING*

BTI has exceptional professional advisory teams representing the business who's who of Colorado and the Rocky Mountain Region. It has been successful in finding people in the area willing to serve as advisors not only because the incubator is situated in an affluent community but also because the program offers these advisors a chance to get involved on the ground floor of growing companies. Some advisors come from the BTI board of directors but others fill only the advisory function. Advising sometimes leads to closer ties to the client companies. For example, investors can get a heads up on a good

client. But in other cases, successful business people enjoy helping because they seek the opportunity for community service.

The incubator has a rigorous 60-day screening process for prospective clients, accepting just one out of every five applicants. Donahue and the executive vice president make the initial assessment of incubator applicants, who must also gain approval from an eight-member executive committee and the full board of directors. Evaluators look for the following criteria: innovative technical ideas; legal patent protectability; product feasibility without undue risk, technical knowledge and edge; market niche and understanding of market; broad application base; growth and job potential; adequate startup funds; financial pro forma statements; professional experience and education; recognition of marketing, financial and management needs; community benefit/awareness; and ecological benefit. Donahue says BTI is looking for entrepreneurs who have potential to become lead management in their growing companies or, if they can't serve in that capacity, have the flexibility and savvy to take the role best suited for them. As BTI's hallmark is placing a team of advisors around its incubator clients, applicants also must be receptive to learning. Since the incubator receives many applicants from the scientific community, another criteria for clients is whether a prospect has adequately scoped out the market before making its business pitch.

Once in the incubator, a client proceeds through an orchestrated set of steps to make it ready for independence, investment and success. The advisory board is at the heart of this strategy. A company's two-to-four member advisory team typically includes a marketing specialist, a professional from a trade or industry related to the client business who is knowledgeable about the marketplace and a financial expert who can crunch numbers. First the advisory team helps the client write or refine a business plan, put together a good management team and network with the technology community. Next the advisors perform a first due diligence, making sure a bank or venture capital firm will not run into any surprises when the client applies for funding. Finally, the team will help the client seek and secure capital, which can come from a variety of sources including loans, profits from sales and services and angel investors. Some clients have benefited from a strategic partnership with an established corporation. For example, a large office supplier pumped money into an incubator company working on a system to track all commodities for prospective purchases, in order to fast-track the software. The partnership triggered more revenues for both companies. The incubator fosters an exchange of ideas, not only with support staff and advisors but also with other companies.

(Sources: Adapted from numerous sources including Gibson, Andrea, "No Substitute for Good Advice – At Boulder Technology Incubator, Custom-Made Teams Are Key," *NBIA Review*, vol. 15, no. 1 (February 1999), pp. 6-9, 16; and the BTI Website, [www.bouldertechincubator.org](http://www.bouldertechincubator.org).)

## CHAPTER 3: CLIENT CAPITALIZATION AND FINANCING

### *overview*

For high-growth ventures, access to capital is likely to be perceived as the most valuable service that can be offered as part of an incubator's comprehensive business assistance program. Sound management, market potential and a myriad of other factors will influence their chances of success, but if everything else is in place, a lack of capital will force even the most promising new venture to miss its opportunity for competing, particularly in the fast-paced technology marketplace. Capital can come in the form of equity, debt or some hybrid of the two.

**Equity Capital** – Equity is the most important form of capital for new, high-growth ventures, and an incubator's ability to provide access to this form of capital will be essential to its long-term success. Sources of equity capital include, but are not limited to, venture capitalists, high-net worth individuals or “angels”<sup>9</sup>, corporate investors, Small Business Innovation Research (SBIR) grants, and other federal and state equity/grant programs (e.g., the National Center for Research Resources – Biomedical Technology Program, the Maryland Challenge Investment Program, the Maryland Enterprise Investment Fund, etc.). Some private incubators have established venture funds specifically to fund the incubator's clients.

**Debt Capital** – Debt capital sources include conventional lending institutions and community-based lending programs focused on broader economic development objectives. Institutions such as the Silicon Valley Bank, with an office in Reston, Virginia, specializes in lending to technology ventures. In addition, funding through participating lenders in the Small Business Administration's 7a Loan Program and venture leasing companies may provide viable opportunities for securing debt funding for clients. Lending criteria, allowable uses and acceptable levels of risk will vary by source and in many cases will not be accessible by early-stage ventures. Because of these limitations, some incubators have established focused lending programs that are only available to their clients. These programs have modified typical lending criteria by shortening the required time in business, the level of collateral needed to secure the loan, the term or length of time for repayment and the interest rate charged. In addition, these programs have provided different lending products such as contract or purchase order financing as a means of supporting early-stage ventures.

Equity and debt capital can be secured for clients using a number of different approaches. Some incubators have been able to establish relationships with traditional equity and debt sources by extending incubator board seats to venture capitalists, “angel” investors and

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<sup>9</sup> Over the past few years “angel” investors have moved to the forefront in providing seed capital to early stage technology ventures. In addition to capital, many of the investors provide mentoring and technical support to companies in which they invest. Moving from investments made as individuals to those by members of small investor groups, “angels” have established highly visible networks following the lead of the Band of Angels in Silicon Valley.

bankers. Others have accessed outside resources, state-funding programs or taken steps to establish their own in-house capital pools. A brief overview of some of these sources is outlined below.<sup>10</sup>

**Capital Networks and Brokers** – Capital networks and brokers are formal organizations that facilitate the interaction between companies and potential investors. Facilitation can come in the form of a referral with no participation in negotiating the deal or a referral with participation in negotiating/brokering the deal. To date, nonprofit networks such as the Golden State Capital Network in California and The Capital Network in Texas have focused on providing referrals with no participation in negotiating the deal. A similar service is provided on a national level by ACE-net, which is supported by the U.S. Small Business Administration. Private sector models such as garage.com and Off Road Capital actually broker the deal, and participate in the deals using their own venture funds.

**In-house Capital Funds** – An in-house capital fund consists of an equity investment fund or a loan fund established specifically to provide capital to incubator clients. Management of such funds may be handled by the incubator staff or by an outside party with specific expertise in equity investing or lending. The recent proliferation of .com incubators established with \$50 to \$100 million-plus equity funds is probably the most visible example of this approach. However, other incubators have been successful in establishing smaller equity and debt funds to serve their clients. Some of these funds have been structured as follows:

- **Seed Capital Fund** – One of the greatest challenges facing technology and other fast-growth ventures is securing capital amounts of less than \$1 million.<sup>11</sup> Consequently, a seed fund designed to provide equity investments in this dollar range can be used along with “angel” investments to fill this gap in financing for incubator clients. Seed capital is typically used to finance feasibility studies, proof-of-concept and prototype development.
- **Tenancy-Contingent Financing** – This form of financing provides equity funds to clients once they have been admitted into the incubator. These funds typically link the investment to performance milestones established for the client, and the incubator taking an equity position in the client’s business.<sup>12</sup>

**Corporate Partners** – Corporate partnering can be used to offset the capital needs of an incubator client. Utilizing this approach, a client can obtain valuable support such as research and development, manufacturing, marketing and distribution, sales, etc. in exchange for license agreements, equity, an increased portion of the revenue generated from sales or some other arrangement that provides financial return to the corporation.

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<sup>10</sup> Chuck Wolfe, *Capital Opportunities for Gazelles in Rural California*, Golden State Capital Network, February 2000, p. 21.

<sup>11</sup> Based on interviews conducted by Claggett Wolfe Associates with technology incubator managers, “angel” investors and venture capitalists.

<sup>12</sup> Tornatzky, p. 15.

Regardless of the approach, it is important for the incubator to understand—and facilitate access to—all sources of capital by utilizing personal contacts, venture forums or other vehicles. In addition, the incubator should maintain information on each source (e.g., approval process, information requirements, allowable uses of funds, amount available, time until the release of funds, etc.) and be prepared to assist clients in securing the capital they need at various stages of their development.

An incubator may not have this service available when it opens, but it must establish this service within a relatively short period of time in order to provide access to the funding sources necessary to capitalize the first round of entrants into the program. The establishment of incubator specific capital program is time consuming and complicated and should only be undertaken if the incubator has sufficient expertise and support to manage such programs.

#### **Role in Supporting a Successful Incubator Program**

- Capital is essential to the success of any technology venture since few can finance growth from revenue generated from sales. Consequently, capital is critical to the success of incubator clients and, in turn, to the success of the incubator itself.

#### **TABLE 3.1: Summary of Best Practices Client Capitalization and Financing**

1. Provide access to debt and equity capital to launch and sustain the growth of clients and train clients on requirements for obtaining financing.
2. Establish linkages with “angel,” venture capital and corporate equity investors through capital networks, brokers and personal contacts.
3. Consider creating in-house equity and debt funds to seed a deal and to fill financing gaps.
4. Create relationships with corporations that are willing to provide services (e.g., product development, manufacturing, sales and distribution, etc.) for clients in the

#### *Best Practices in Action*

*Evanston Business and Technology Center, Northwestern University, Evanston, Illinois  
Practices Highlighted: Equity Funds*

The Evanston Business Investment Corporation (EBIC) operates seed capital funds as a service for clients of the Evanston Business and Technology Center. EBIC is located in the incubator but operates independently from that organization. It invests between

\$50,000 and \$150,000 in incubator companies and other local businesses. EBIC also provides financial advice to clients who are seeking financing options. Thus far, it has developed two seed funds. The first fund was \$1 million, and the second fund was \$1.5 million. As of 1999, the first two funds were fully subscribed.

EBIC is locally organized and makes equity investments in early-stage, growth-oriented companies based in Evanston. Founded as a nonprofit, EBIC has adopted a mission of encouraging entrepreneurship and new job creation in Evanston. Investments are initially limited to \$50,000 and are structured as 10-year notes. The advisory board of the fund consists of representatives from venture capital firms, successful entrepreneurs and academics.

A matching investment from another source is generally required; however, the size of the match depends on the financial requirements of the client. In addition, the applicants must either be based in Evanston or agree to move to the area within 90 days of EBIC's investment. Applicant qualifications include a strong business plan, a capable management team and significant personal and financial commitment to the success of the business. EBIC management generally requires representation on the boards of directors of each company in its portfolio.

EBIC's job creation goals are achieved as a result of its growth-oriented investment strategy. EBIC follows these investment guidelines:

- No more than 10 percent of the partnership's total capital may be invested in any one company. This limits EBIC's maximum investment to between \$100,000 and \$150,000 per company.
- Additional commitments from other investors are generally required, although no set dollar-for-dollar matching ratio has been established.
- EBIC requires representation on the board of directors as a condition of investing in start-up companies and/or in cases where EBIC is the firm's lead investor.
- EBIC invests in a diversified portfolio of technologies and industries rather than specializing in just one or two industries.
- EBIC will make 75 percent of its investments in companies that are located in Evanston or that have agreed to relocate to Evanston within a reasonable period of time after EBIC's investment. The remaining 25 percent will be made in companies that are located elsewhere in the Chicago metropolitan area.

(Source: Conversations with Tom Parkinson, Executive Director, Evanston Business Investment Corporation, in May 2000.)

*Arizona Technology Incubator, Scottsdale, Arizona*

Practices Highlighted: *Equity Funds*

The Arizona Technology Venture Fund (ATVF) is a \$600,00 seed capital fund. As of the end of 1999 it was fully subscribed. The fund invested from \$25,000 to \$60,000 in each company in its portfolio, including 10 to 12 firms that were residents in the Arizona Technology Incubator. In several instances the fund's agreements included clauses allowing the fund the right to convert its equity stake to debt – to recover the original capital – in the event that the firm awarded an investment does not go public in five years. ATVF is currently in the process of developing a second seed capital fund.

(Source: Conversations with Sandy Hunter, CEO, ATVF, May 2000.)

*Incubator for Technological Entrepreneurship (ITEK) at Kiryat Weizmann, Ness-Ziona, Israel*

Practices Highlighted: *Equity Funds*

Private seed capital is in short supply in Israel for commercializing new and untried technologies and growing new companies. Although several Israeli incubators have had positive relations with venture capital, so far ITEK has had better results with business angels. Yerushalmi believes this may be related to the rather small financial needs of ITEK's projects at the time they leave the incubator – normally less than \$1 million, and in many cases bridge financing of only \$200-\$400,000 until the real first round. Angel investors have been finding ITEK themselves, either through their contacts with people and organizations familiar with the incubator's operations, upon browsing its Website, as the result of frequent mention in the press or other news media, or through word-of-mouth. The incubator plans to become more proactive in identifying angels.

Most of the angels associated with incubator clients are local, but an increasing number of them are located abroad, primarily in the United States or Europe. As with angels elsewhere, they are individuals who have already invested in successful enterprises – not necessarily startups – and they have the

financial capability to participate in risky outlays. They come to understand ITEK's structure, its board and management, and this becomes an important ingredient in establishing trust on a personal level.

(Source: Correspondence with Shmuel Yerushalmi, ITEK Incubator Manager, May and June 2000.)

*Idaho Innovation Center (IIC), Idaho Falls, Idaho*  
Practices Highlighted: *Debt Funds*

The Center has initiated a \$1 million revolving loan fund that can be used to help companies purchase equipment or meet other needs, except finance existing debt. It provides needed financial resources for companies without them having to go outside the incubator. The minimum loan is \$1,000 and the maximum is \$250,000. The rate/term for working capital is prime plus 1-5 percent for 60 days to five years. For fixed assets it is prime plus 1-3 percent for not more than 20 years or the useful life of the asset. Some flexibility is allowed depending on the borrower's needs. Eligible businesses include new and emerging high-tech businesses that are involved or related to the technology from the Idaho National Engineering and Environmental Laboratory (INEEL), a federal lab, and businesses started by INEEL dislocated workers. Businesses must be located in the same county as the incubator. Selection criteria include a turndown letter from a bank or private lender and an emphasis on creating jobs. Once IIC receives the turndown letters from the lenders, it returns to the lenders with a request for partial participation. The incubator asks the financial institutions if they will reconsider the loans if it (IIC) puts up a percentage of the loan amount. By leveraging money in this fashion, IIC has used a \$1 million investment to create \$2.3 million in local capital investment.

(Source: Conversations with Rick Ritter, Idaho Innovation Center Director, in May 2000.)

*Incubator for Technological Entrepreneurship (ITEK) at Kiryat Weizmann, Ness-Ziona, Israel*  
Practices Highlighted: *Debt Funds*

This incubator commonly provides in-house financing to companies who have completed the two-year incubation period by delaying its charges of overhead expenses (rent, electricity, faxes, copying, etc., which are normally charged at cost). This kind of financing enables a graduate company to continue its presence on site, to be able to make presentations before potential partners and to use whatever source of income it may have (sub-contract work, etc.) to cover salaries and sundries. In parallel the incubator manager continues his efforts in helping the graduate find and negotiate with potential partners from a position of strength. According to Yerushalmi, this policy has been quite effective, and so far all of these internal "loans" have been duly returned. Given the difficulty of acquiring financing and corporate partners for companies, Yerushalmi is

considering creating a “post-incubation” operation that will exist under the same roof and management and will allow ITEK to provide more value to its graduates.

(Source: Correspondence with Shmuel Yerushalmi, ITEK Incubator Manager, April 2000.)

*Panasonic Internet Incubator (PII), Panasonic Digital Concept Center, Cupertino, California*

Practices Highlighted: *Corporate Partnering*

The Panasonic Internet Incubator (PII) is one of three components of the Panasonic Digital Concept Center. Through its affiliate program, the Panasonic Global Network (PGN), clients of the PII have access to a wide range of corporate resources at Panasonic and parent corporation Matsushita Electric Industrial Co., Ltd. PII clients obtain the following benefits:

- The technologies of PII firms are profiled and distributed worldwide to appropriate Matsushita research and product development divisions.
- Technical and business specialists from Matsushita’s worldwide research and product development divisions are brought on site to work with PII clients and to analyze market opportunities available through Matsushita internal clients.
- PII clients are sent to Matsushita research and product development sites worldwide to present their technologies and to investigate strategic partnering opportunities.
- Panasonic allows clients to pursue market opportunities outside of Matsushita.
- Matsushita may provide other opportunities to PII clients by licensing technologies and/or providing support by manufacturing products, co-branding, co-marketing, co-distributing or embedding a technology in a Matsushita product.

(Source: Conversations with James Robbins, Panasonic Internet Incubator Director, May 2000.)

*Rensselaer Polytechnic Institute (RPI) Incubator Program, Troy, New York*

Practices Highlighted: *Capital Networks*

Each month Rensselaer Polytechnic Institute’s Incubator Program asks that two client companies stand up and present their business plans to a large audience. According to Bela Musits, incubator manager, the “motivation is not to raise capital but to learn how to present your business plan. We bill it as a learning experience.” Each company gets 20 minutes to present their plan before an audience of 70 to 100 people, including angel equity investors, venture capitalists, business professionals, students and other incubator clients. The clients also spend 10 minutes answering questions from a panel of three to five venture capitalists. The investors don’t come with the understanding that they’re doing a hard review of a business plan, but of 10 companies that have thus far presented, three have raised money. Since students and other clients are in the audience, the learning isn’t limited to the presenters. In fact, the audience learns a lot about how and how not to present their own plans. The program is marketed through the incubator newsletter and flyers, which go to 1,500 community members. Soft drinks and cookies or some other refreshment — and a half-hour of networking — always precede it. The success of

the program is evident in its growth, given that 30 attended the first session and the fourth program attracted 100.

RPI's Incubator Program also mounts a "technology fair" each year during the Institute's annual Entrepreneur of the Year Celebration, which is organized by the Lally School of Management. This event normally salutes a highly successful entrepreneur – typically an RPI alumnus. Many wealthy people, including investors and alumni, are on hand for this event, which attracts 300 to 400 attendees.

The "fair" involves poster board presentations of a half-dozen to a dozen incubator clients and others who may have a great idea but have not yet begun company operations. Again, refreshments are served, and each entrepreneur stands next to his or her poster board to describe their project. Several participants have developed partnerships (business or marketing) and investments as a result. In one instance, an alumnus "discovered" a new Ph.D. with a tremendous idea and by the end of the day they had a handshake agreement and subsequently began a company. Incubator Director Musits identifies companies for the fair, which is strictly optional insofar as client participation is involved. The program is marketed heavily in the incubator newsletter and flyers and also in RPI news releases that announce the keynote presentation by the Entrepreneur of the Year.

(Source: Telephone conversation with Bela Musits, Rensselaer Polytechnic Institute Incubator Program Director, June 2000.)

*The Capital Network, Austin, Texas*

Practices Highlighted: *Capital Networks*

The Capital Network (TCN) is an Austin, Texas-based company that is one of the nation's largest seed and venture capital networks, consisting of over 15,000 firms, financing sources and business assistance organizations. The network offers investor-to-entrepreneur introduction services, educational programs, venture capital conferences, seminars, software and an extensive "know-how network" of experts and advisors. The network maintains a database of business experts who can help firms in deal structuring, marketing and management. To become a member of the network, entrepreneurs pay \$750 to be listed for six months, while investors pay \$1,250 for a year.

TCN organizes angel investor receptions, which are held to showcase three high-growth-potential startup businesses. These events are held nine times a year. In addition, larger conferences are held for venture capitalists, corporate investors and money managers. These conferences draw an attendance of 500-750 people.

As of May 2000, the Network claims to have facilitated agreements totaling more than \$250 million between participating investors and ventures.

(Source: Conversation with Christian Garces, Business Development Manager, The Capital Network, May 2000.)

*Software Business Cluster, San Jose, California*

Practices Highlighted: *Capital Networks*

The SBC has developed a Venture Capital Referral Program designed to assist clients in securing equity capital from venture capital and “angel” investors. Each SBC client received personalized support from the incubator’s executive director and/or managing director throughout the process, which includes:

- A comprehensive review of the business plan/model from the perspective of potential investors. This review is conducted by SBC staff as well as appropriate incubator board members, Executive Associates Program volunteers and area professionals who are members of the SBC’s professional services network.
- Directed comments, questions and suggestions to help the client restructure the business/plan model.
- Assistance in preparing a funding presentation.

If the SBC staff believes the business to be fundable, they will refer it to one or more venture capital and “angel” investors in their network. Due to the thorough analysis conducted by the SBC, several venture capital forums have supplied designated “slots” for SBC companies to present. In the past three years all but one SBC company received a venture capital term sheet offer as a result of their presentation at these forums. In total, over 80 percent of the SBC’s clients have secured venture capital.

(Source: National Business Incubation Association Randall Whaley Incubator of the Year Award Application, 2000, and conversations with James Robbins, Software Business Cluster Director, May 2000.)

Practices Highlighted: *Capital Networks*

The Boulder Technology Incubator has a close alliance with the Venture Capital Association of Colorado, which is a stakeholder and sponsor of the incubator. Notes President Jerry Donahue: “We still don’t have the pot of gold. They do. But they look to us for sourcing some of their deals, particularly their very early stage ones – for example, with technology coming out of the University of Colorado, where market studies and business plans haven’t yet been conducted.”

BTI has assisted clients in raising \$500 million in capital, mostly from three different sources. In order of magnitude, these are formal venture capitalists, strategic partners (usually another corporation) and angels. Of these the angels “come to the fore” first but usually provide the smallest investments. Donahue is always scouting investment opportunities for his companies. “When they get to the point of being ready for prime time, we invite in a host of investors” (including partners, angels and venture capitalists) to hear a presentation of about 20 minutes or less, sometimes only 12 minutes. Donahue also embeds several clients seeking financing in the annual meeting program of the Association. Companies aspiring to investment provide 12-minute presentations at the VCAC annual meeting.

(Source: Telephone conversation with BTI President Jerry Donahue, June 2000.)

## CHAPTER 4: CLIENT NETWORKING

### overview

A much-vaunted benefit of business incubation programs is the synergy that develops from client networking. Incubator managers recognized the effects of client networking for many years before research confirmed them. However, the extent and significance of these effects was unknown until Dr. Gregg Lichtenstein revealed them in his Ph.D. dissertation for the Wharton School at the University of Pennsylvania, *The Significance of Relationships in Entrepreneurship: A Case Study of the Ecology of Enterprise in Two Business Incubators*<sup>13</sup>. Since then, it has been imperative for best practices incubators to be attentive in providing the environment and facilitation required to encourage client networking.

Lichtenstein described three types of benefits received by clients through their interactions and relationships: psychological, instrumental and developmental. An overview of each of these interactions and relationships is highlighted below.

**Psychological** - The first represents the moral and psychological support provided by the incubator and by clients to each other. In a *best practices* incubator clients feel nurtured, encouraged and supported and they obtain a sense of security that they would not have on their own. Given the extreme stresses that entrepreneurs experience when careers, investments and even family relations are threatened, the atmosphere of the incubator can provide a significant margin of difference. While legend extols the entrepreneur who started business in a garage or dorm-room, this isolated venue is probably best suited to the youthful entrepreneur who has few responsibilities or endangered investments. As Lichtenstein notes: “The uncertainty of not knowing from one day to the next about whether one is going to survive can be extremely stressful.”<sup>14</sup>

**Instrumental** - Instrumental benefits are those that relate to the work or tasks of operating a business and take the form of increased sales, lowered costs, enhanced capabilities and reduced risk. These benefits derive from beneficial business contacts and expertise provided by the incubator’s know-how network, mentors and other experts, opportunities for sharing employees and equipment, co-bidding and the availability of computers, laboratories and other business and technical resources.

**Developmental** - Developmental resources are those most likely to be underestimated by incubator management, but they also are critical. According to Lichtenstein, entrepreneurs are learners in many aspects of their work. Development is, therefore, “the process of increasing the firm’s and entrepreneur’s abilities by acquiring skills and generating new ideas.”<sup>15</sup> Interaction with others facilitates the process – during informal meetings at the coffee machine and formal CEO meetings, at which significant issues are raised and discussed. While entrepreneurs also learn through presentations by outside experts, the “tilling and watering of the soil” both before and after these presentations represented by peer interactions is invaluable to the learning process.

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<sup>13</sup> A dissertation in entrepreneurship for the Social Systems Science Group in the Management Department at the Wharton School, 1992.

<sup>14</sup> Ibid., p. 49.

<sup>15</sup> Ibid., p. 51.

Lichtenstein characterizes eight factors that influence incubator interactions.<sup>16</sup> These are:

- Types of businesses – Clearly it is easier for companies in similar industries to share equipment, obtain contacts and learn from each other.
- Personal characteristics – Some entrepreneurs are loners and not suited to an incubator environment, which requires a willingness to take advice and accept criticism.
- Stage of development – Entrepreneurs at the same stage of development face similar changes and benefit from sharing problems, whereas entrepreneurs at lower stages of development can also learn from and emulate those that have preceded them.
- Space – Layout of space contributes to interaction. A common entryway, common lunch and meeting rooms, doors that are open, windows from client spaces into hallways and in meeting rooms all encourage greater interaction among entrepreneurs.
- Forums – CEO meetings, brown-bag lunches and other facilitated discussion forums permit learning and interaction, and they help create the trust that is necessary for higher-level synergistic relations.
- Critical mass – The smaller the number of firms in the incubator, the less likely entrepreneurs will find others with common interests or problems, or resources for sharing. Likewise, an extremely large program might make meeting others of like interest more difficult unless attention is given to overcoming barriers.
- Norms and attitudes – The incubator must promote norms and attitudes that include sharing, support, openness to ideas and friendly relations among clients. Potential clients who show evidence of unfriendliness, excessive secrecy and unwillingness to learn from others should be excluded at the outset.
- The incubator manager – Perhaps the “most important influence on interaction,” according to Lichtenstein, is the incubator management.<sup>17</sup> It is key for the manager to recognize the importance of relationships to entrepreneurship and to be skillful in promoting them. A manager who stays behind closed doors is the wrong choice for any incubator.

Issues related to incubator staffing, facilities and know-how networks are dealt with elsewhere in this guide. The most common practices to promote client networking outside of these areas include the following:

**Brown Bag Lunches** – These generally involve providing expert speakers about topics that have been suggested by incubator clients or have been revealed through client monitoring. Programs where lunches are provided tend to draw more clients, but the key is having speakers who are knowledgeable, interesting and relevant—ensuring a meaty presentation—and providing opportunities for facilitated discussion.

**CEO Forums** – These are primarily facilitated discussions of company founders and top-level management, at which the clients critically discuss plans, problem-solve and share high-level concerns. In some cases, more experienced entrepreneurs and business service providers are invited to these sessions, but care must be taken that these individuals don't become the focus of the meeting and promote their expertise to the disservice of sharing among the entrepreneurs.

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<sup>16</sup> Ibid., p. 53.

<sup>17</sup> Ibid., page 56.

**Affiliates Programs** – Often larger groups of incubator clients and those outside the incubator who are also involved in developing emerging companies participate in affiliates programs. Rensselaer Polytechnic Institute’s programs bring in prestigious speakers, but they provide plenty of time for networking and discussion.

### **Role in Supporting a Successful Incubator**

- Provides clients with moral and psychological support, reducing stresses and the likelihood of failure due to burnout, depression and other ills
- Provides instrumental benefits including opportunities for sharing expertise, employees and other resources, co-bidding, etc.
- Provides important contributions in preparing clients for learning and enhancing the learning experience
- Shifts some of the burden of counseling clients to others inside and outside the incubator, permitting management more time for monitoring and higher-level coaching

**TABLE 4.1: Summary of Best Practices  
Client Networking**

1. Proactively encourage client networking to establish and sustain the incubator’s nurturing environment.
2. Pay attention to facility design issues, host brown-bag lunches, CEO roundtables and affiliates programs to bring business owners together to exchange ideas, share experiences and leverage resources.
3. Hire incubator management that values client interaction and networking and is capable of facilitating these processes.

### *BEST PRACTICES IN ACTION*

*Advanced Technology Development Center (ATDC), Georgia Institute of Technology, Atlanta, Georgia*

Practices Highlighted: *Client Networking*

The “Brown Bag Program” is a weekly lunchtime seminar that addresses issues critical to ATDC clients. The program provides highly targeted, high-quality assistance to client companies at a fraction of market value. The program has three basic goals: to provide networking opportunities for clients and graduates; to raise awareness of the issues that are critical to small businesses; and to give client companies opportunities to preview a wide range of professional service providers during an extended period of time before deciding to hire them. The incubator holds over 40 of these brown bag lunch programs a year. The program is driven by the needs of client companies because ATDC finds out what topics are of interest through annual surveys and word-of-mouth.

Once a week, client companies assemble in the incubator's conference room to hear a guest speak about a topic in which they have expertise. A staff member hosts the speaker before each session and familiarizes them with the incubator if they are new to the program or brings them up to speed on current events if they have participated previously. The topics fall under five categories including legal, financial, human resources, marketing or business planning. The format of the session varies from lecture to roundtable to Q &A; the presentation method is chosen to get the most out of the speaker's time and subject. The sessions' length varies, but the speakers generally bring 20-30 minutes of material on a given subject. Sometimes the speakers are employees of graduated companies. Recruiting speakers is also fairly easy because many see it as free exposure to potential customers, although the invitation to speak clearly states that the focus must be on education and not selling services. Due to the nature of the program, it generally costs the incubator less than \$20,000 per year, which covers costs of staff management, videotaping the sessions and mailing costs associated with sending materials to off-site companies. The speakers provide the luncheons. Attendee benefits are learning hands-on skills that are important to the success of their businesses and meeting people who in the future may provide one-to-one assistance to them. The Brown Bag Program offers a wonderful networking opportunity for clients and graduates.

(Source: Adapted from *Innovative Programs That Help Companies Succeed*, National Business Incubation Association, 1997, pp. 59-65, and updated through conversations with Susan Shows, Associate Director, Advanced Technology Development Center, in May 2000.)

*Rensselaer Polytechnic Institute Incubator Program, Troy, New York*  
Practices Highlighted: *Client Networking*

The Venture Affiliates of RPI (VARPI) is another innovative RPI program, geared to incubator affiliates. Start-up and fledgling technology companies not located in the incubator pay several hundred dollars each year in program fees to join VARPI, giving them access to every program and all services of the incubator. The program "extends the wingspan of the incubator beyond the four walls of this building," says incubator Director Bela Musits. VARPI workshops are held each month in the afternoon. Both clients and affiliates (and RPI students) participate in workshop programs featuring a businessperson or business services professional who addresses a discrete topic of interest to the entrepreneurs. Topics meet the description: "Everything you want to know about running a business that they didn't tell you when you got your MBA," says Musits. A recent session focused on human resource management including employment law, hiring, how to conduct a good interview, what you can't ask in an interview situation, how to write a good job description, how to terminate employment, etc.

Each workshop begins with refreshments and networking and lasts about an hour-and-a-half total. VARPI meetings are marketed through the incubator's newsletter, its Web page, flyers and broadcast email. Rensselaer boasts 50 VARPI affiliates, who can access Musits for consulting whenever they need. The admission requirements are that the applicant be a technology company and have a business plan – which are the same entrance criteria used by the incubator. Other than that, there are no rules, says Musits. The incubator manager finds that VARPI members are happy to be included in the incubator's many programs and to obtain the resources of RPI.

(Source: Telephone conversation with Bela Musits, Director, Rensselaer Polytechnic Institute Incubator Program, June 2000.)

*Software Business Cluster (SBC), San Jose, California*  
Practices Highlighted: *Client Networking*

The SBC has two structured programs to encourage networking between clients. The first is a Brown Bag Lunch Program that consists of monthly lunch seminars by local business professionals from incubator bankers, outplacement specialists, venture capitalists, lawyers, accountants and others. The topics are selected based on information gathered during the regular coaching and facilitation meetings conducted by the executive director and/or managing director. The focus of the lunches is to stimulate interaction between the SBC's clients, to educate clients about specific topics of interest and to introduce clients to competent and experienced professionals.

The second client-networking program supported by the SBC is the CEO's Roundtable. This program consists of a monthly meeting that allows the CEOs from client businesses to present success stories, discuss common problems, provide advice, and exchange ideas on issues with their peers. These discussions focus on assigned topics identified during the regular coaching and facilitation meetings conducted by the executive director and/or managing director. A different CEO facilitates each session.

(Source: National Business Incubation Association Randall Whaley Incubator of the Year Award Application, 2000, and conversations with James Robbins, Software Business Cluster Director, May 2000.)



## Chapter 5: Technology Transfer and Commercialization

### Overview

In March 1999 the Committee on Science, Engineering and Public Policy of the National Academies of Science and Engineering and the Institute of Medicine released a report<sup>18</sup> whose chief finding is that one of the keys to current U.S. economic strength is the growth of new science and technology-based businesses. The study assessed how well the United States is capitalizing on its science and technology investments, identified the reasons for U.S. success and made recommendations to strengthen the commercialization process.

The report presents detailed recommendations to strengthen R&D capitalization, summarized as follows:

- Maintain strong, stable funding for a portfolio of research investments that is diverse in terms of funders, performers, time horizons and motivations
- Maintain a favorable environment for capitalizing, characterized by a strong incentive structure for investors, competition in the market and free movement of ideas and people between institutions
- Support a skilled, flexible science and engineering human resource base that allows the United States to maintain research at the cutting edge and capitalize effectively
- Support mechanisms for research and capitalization that encourage co-operation between academics, industry and government<sup>19</sup>

In brief, the Committee encourages even greater diversification of funding sources for U.S. R&D, a continued experimentation by governments, universities and industry with consortia and partnerships, and improved incentives for capitalization; in particular, incentives at universities should be revised to encourage technology commercialization.

This report by such prestigious institutions should give added impetus to the current movement by research institutions to participate more directly in technology commercialization by company formation. Forward-thinking universities, federal laboratories and private enterprises throughout the United States are increasingly recognizing the limitations of continuing to license technology innovations only to large, established firms. Instead, many owners of exciting technologies now license assets to new enterprises that promise to maximize the return on their research investments. A small cadre of these institutions is breaking still newer ground – going beyond merely licensing to start-up businesses. These universities are identifying platform technologies and participating in hands-on company formation.

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<sup>18</sup> Committee on Science, Engineering and Public Policy, *Capitalizing on Investments in Science and Technology*, National Academy Press, Washington, D.C., 1999.

<sup>19</sup> *Ibid.*, p. 4.

This strategy is controversial in some quarters because the traditional culture of federal laboratories and of universities is that these institutions engage in basic research, leaving to private industry the creating of saleable new products and processes. As an engineering school, the Massachusetts Institute of Technology has bucked this tradition and has long sought to apply its discoveries in the real world. A Bank Boston study recently found that combining revenues of all of the companies formed by MIT faculty and graduates would equal the world's 24th largest economy. Many other universities, however, have not encouraged faculty to penetrate the barriers between creating technology and applying it. Yet a growing percentage of university R&D support is from industry. Penn State, for example, reported that business paid for 15 percent of all its 1995 R&D.

The managing director of MIT's Sloan Entrepreneurship Center, Ken Morse, notes that the "best vehicle for taking technology from the lab to the marketplace is the company. That's why we think and care about creating companies."

How are the leading edge U.S. technology universities creating companies? This varies from institution to institution, but it involves the following series of steps:

- Identifying a platform technology within the university. This is a technology that can result in not just a new product, but a series of new products and processes of sufficient breadth and market potential on which to base a company and attract investment
- Investing in patents and other intellectual property protections and developing the technology to the point that the company can be formed. Also determining the role of the inventor
- Incorporating the company, issuing stock, completing license agreements and executing other company formation processes including identifying interim management – both a CEO and initial board of directors
- Developing the business plan of the company, which includes financing plans, valuation and how the original investors will exit, or liquefy their investment
- Providing technical and business support during start up of the new venture including assistance with human resources management, access to laboratories and equipment, contacts with a network of resources and potential alliance partners, and access to flexible office and/or research and production space
- Raising the substantial venture investment required for getting beyond initial stages of business and bringing in additional sophisticated management
- Handing the company off to management as an independent company

As noted, the structures for accomplishing all these steps vary and involve a number of different players: the laboratory's outreach services, the university's technology commercialization office, a for-profit or not-for-profit technology commercialization arm or research foundation, and a business incubator program and facility. A key to success is close and synergistic relations between all these individuals and offices – a seamless interface, in fact.

All of these successful technology commercialization efforts recognize the following:

- The “art” of partnering. R&D doesn’t magically pass over the transom from university to business
- It is not possible to avoid conflicts of interest between the parties involved and their different goals, but it is necessary to manage them by setting up appropriate institutions and procedures
- It is necessary to address the requirements for cultural change within the university or laboratory. This means working within the university and the community to affect aspects of both cultures
- Universities face similar challenges to other institutions that are involved in “reinventing” themselves and developing “customer responsiveness”
- Business itself is a key customer of the university

Several reports, including one issued in 1999 by Battelle Memorial Institute and Ohio State University,<sup>20</sup> address best practices in university partnerships including technology commercialization. Basic to this is articulating a vision, expectations, policies and incentives for technology commercialization. This vision must have commitment from the institution’s senior leaders, who must work to revise structures, hire the right staff and promote changes in faculty incentives. The leadership must also invest in increasing the return from technology commercialization – words are not enough. This investment should finance active identification of platform technologies for commercialization, intellectual property protections and business incubation activities.

Universities must also exercise flexibility in licensing agreements and recognize that the goal of the university must be to ensure the success of the business. John Preston, former technology commercialization manager at MIT, got rid of the university lawyers that previously held sway and brought in people who understood the requirement to provide incentives to all parties in order to ensure the success of the start-up company. The university must forego its natural inclination to demand an agreement that is biased only to itself. The investment and management partners must have incentives to develop a successful company that can, in turn, “make the university a lot of money.” The structure of agreements and ownership must balance incentives and returns for each of the different partners.<sup>21</sup>

In our view, technology commercialization can be differentiated from technology transfer, in that the former implies substantial involvement in ensuring that the technology is expressed in commercializable products and services. A best practices university, research laboratory and affiliated incubation program can promote technology commercialization in two ways: by assisting the research institution in moving its technology into the widest array of applicable products and services – using new company formation when this is the best means of doing so – and by identifying problems and challenges faced by business and industry that can be addressed by applying a new technology as a solution.

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<sup>20</sup> *Technology Partnerships: Benchmarking Ohio State University and Peer Institutions*, Battelle Memorial Institute and Ohio State University, 1999.

<sup>21</sup> Heretofore, this introduction has been adapted from an unpublished speech authored by Dinah Adkins, National Business Incubation Association Executive Director, and first given in St. Petersburg, Russia, June 1999.

The primary practices incubators and their affiliated or host institutions utilize to promote technology licensing and commercialization include:

**Overcoming cultural impediments** – This involves recognizing cultural differences between research institutions, technologists, entrepreneurs and community businesses, and building forums, policies and procedures for overcoming them. In particular, it is important to recognize that conflicts of interest cannot be avoided but can be managed.

**Providing financial incentives** – Small Business Innovation Research (SBIR) grants work on the national level to promote technology commercialization by entrepreneurial companies – and thus achieve a better return on the investment in these technologies. On the local or state level, commercialization grants can be just as effective.

**Organizing to promote the “seamless interface”** – Incubators and their host institutions are best served by co-locating technology licensing and commercialization functions, or ensuring that they report to the same individual.

**Developing comprehensive support for commercialization** – These involve developing expertise in business incubation generally and in strategic partnerships, licensing, equity participation, deal making, and all the other components of transforming technologies into companies.

Due to their focus on entrepreneurial firms, incubators are less commonly involved in developing a strong interface with existing business and industry to assist them in solving their problems through the applications of new technology. Usually, some other office of the university or laboratory has this task. However, this function also promotes effective technology commercialization and is sometimes rolled into the responsibilities of the incubator with beneficial results.

## **Role in Supporting a Successful Incubator**

- Increases the business incubator’s potential client base and its impact
- Expands the expertise of incubator-affiliated volunteers and staff in all aspects of technology application and company development
- Increases the return on investment to the incubator host research institution and binds incubation more solidly to the economic development and research missions of the host institution
- Increases the prestige of the incubator as an “engine” for developing technology infrastructures and entrepreneurial economies

**TABLE 5.1: Summary of Best Practices  
Technology Licensing and Commercialization**

1. Develop partnerships with technologists and technology transfer offices with the principal objective of commercializing technology through new company formation.
2. Manage conflicts between all parties; offer incentives for commercialization and work to change potentially incompatible cultures to become more responsive.
3. Establish a seamless interface between the incubator and the technology generator to ensure fast and effective commercialization.

### *Best Practices in Action*

*Advanced Technology Development Center, Georgia Institute of Technology, Atlanta, Georgia*

Practices Highlighted: *Technology Transfer and Commercialization  
University and Federal laboratory Linkages*

The Faculty Research Commercialization Program helps academic and research faculties from six Georgia Research Alliance institutions move research technology from the conceptual lab stage toward a commercially viable product. The grants are for one year, range from \$30,000 to \$100,000 and are supplemented by business guidance. The technology must be beyond the basic research stage and should be directed at a specific product or technology with commercial potential and a demonstrated market opportunity.

The process works in several stages. First, applicants are asked to conduct a self-assessment and are given guidelines for doing so. Second, they submit a two-page proposal preview to ATDC for initial consideration. At this point, a researcher must decide to proceed to the next stage in which he/she submits a full proposal that effectively communicates the project’s technological innovation and business merit. Each application is reviewed for a sign of commitment from the principal and evidence that the project might continue without ATDC funds. After review by staff and external consultants, the field is narrowed to 12-16 semi-finalists. All semi-finalists are visited on their campuses for extensive review and a hands-on look at the technology. A second cut narrows the group to 9 to 12 who present their projects to staff and discuss key issues. Six to

seven finalists are awarded grants each year. Each winner's grant varies depending on the project. The incubator makes awards to the highest extent possible within the budget allocation by the state. The total budget allocation in 1999 for this program was \$350,000. Awards of \$50,000 or more must be matched by outside sources. A senior staff member monitors the use of funds and progress of the project throughout the year. This involves monthly progress reports and quarterly meetings. Success rates have helped convince the State of Georgia to allocate more money to the program in each succeeding year. The resulting understanding of high-technology commercialization processes that ATDC staff members gain helps them improve their consulting and widen their skills base.

(Source: Adapted from *Innovative Programs That Help Companies Succeed*, National Business Incubation Association, 1997; updated through conversations with Susan Shows, Associate Director, Advanced Technology Development Center, in May 2000.)

*Louisiana Business and Technology Center, Louisiana State University, Baton Rouge, Louisiana*

Practices Highlighted: *Technology Transfer and Commercialization  
University and Federal Laboratory Linkages*

Louisiana State University is an example of university that has institutionalized technology commercialization. As the result of a change in Louisiana law directing the university to emphasize licensing technology to Louisiana firms, LSU has recognized the importance of contributing to economic development in its mission statement. LSU also created a position responsible for technology commercialization and economic development at the vice chancellor level. The university administration has directed faculty and staff to partner with local industry, assist in commercializing technologies and participate in supporting startup companies. LBTC Incubator Manager Charles D'Agostino reported significant increases in sponsored research, industry partnerships and royalty payments. Further, of the 25 firms in the LBTC incubator, 15 license LSU technology or are owned by faculty or students.

(Source: *Commercializing Technology Through New Company Formation*, National Business Incubation Association, Athens, Ohio, June 2000.)

*Arch Development Corporation, The University of Chicago, Chicago, Illinois*

Practices Highlighted: *Technology Transfer and Commercialization  
University and Federal Laboratory Linkages*

The University of Chicago decided that they should focus on company creation as a way to capture greater financial value. UC set up a wholly owned corporation, Arch Development Corporation, to act as the university technology transfer program. This corporation has been creating and investing in new companies since the mid-1980's. Initial funding for Arch Development came from the university. However, by the early 1990's the corporation was able to fund itself from returns on investments. Arch Vice President Terri Willey explained that Arch takes equity in companies based on university technology in lieu of licensing fees, in return for assisting in founding the companies and

providing management team development and, finally, in exchange for investing cash in technology start-ups.

(Source: *Commercializing Technology Through New Company Formation*, National Business Incubation Association, Athens, Ohio, June 2000.)

*Technology Innovation Center (TIC), University of Iowa, Iowa City, Iowa*  
Practices Highlighted: *Technology Transfer and Commercialization*

The University of Iowa's vice president for research is responsible for its technology transfer program. Technology Innovation Center (TIC) Associate Director Tom Bauer believes that the program's success is due, in part, to the fact that intellectual property management, the technology transfer office, the business incubation program and the industrial park all report to this same individual. The incubator was established to assist new business ventures that are likely to develop research relationships with the university. The incubator nurtures formal spin-offs from university research as well as "spin-in" firms. In the latter case, it assists companies that wish to gain access to university resources and technologies. As of April 2000, faculty, staff or students started 14 of 17 current TIC clients. Of 14 graduate companies, faculty, staff or students started seven.

(Source: Conversations with Tom Bauer, Technology Innovation Center Associate Director, April 2000.)

*Incubator for Technological Entrepreneurship at Kiryat Weizmann (ITEK), Ness-Ziona, Israel*

Practices Highlighted: *Technology Transfer and Commercialization*

According to Israeli R&D Law, technologies developed under the financial support of the OCS (Office of the Chief Scientist, Ministry of Industry and Trade) cannot be sold abroad, nor can production rights be sold in such a way that production will be performed outside Israel, unless granted a special approval from the OCS.

Therefore, at the Incubator for Technological Entrepreneurship at Kiryat Weizmann (ITEK), Ness-Ziona, commercialization commonly encompasses the following alternatives, singly or in combination:

- Strategic partnerships with a foreign enterprises, under which the product/technological platform will be adapted to the specific partner's product line
- License of marketing rights (exclusive or not, worldwide or split among territories)
- Equity partnerships
- Financial support for further development against specific commercialization rights

Technology may be transferred to a partner that is an Israeli operating enterprise, even if it belongs to a foreign owner; safeguards are then established to avoid circumventing OCS guidelines.

Each of the alternatives listed above are utilized during and following incubation, with the participation of the ITEK incubator manager, the business manager associated with each specific project and external consultants and others who procure investments, where applicable.

In the event the two-year period allotted for incubation is over and there are no incipient deals to be closed, the incubator allows the project to remain on site, and provides further intensive support in order to find the best available deal for the project. This may sometimes take more than one full year.

ITEK management undertakes a continuous search for potential corporate partners for its clients. Sources that are researched include Websites and business representatives of large multi-national organizations that maintain liaison offices in Israel (independent of their marketing and sales agencies and representatives). Partners are also identified through the flood of overseas delegations (governmental and private) that are continuously visiting the incubator. There were more than 50 such delegations last year.

Preferred strategic partners are industrial enterprises for whom the technology platform offers the opportunity to define a new product to be incorporated into their existing product line. Generally the partners provide funds to assist in developing this new product or adapting the existing product to their specific requests, and they normally obtain marketing rights in return.

(Source: Correspondence with Shmuel Yerushalmi, ITEK Incubator Manager, April 2000.)



## CHAPTER 6: UNIVERSITY AND Federal Laboratory Linkages

### *overview*

It would be difficult to under-estimate the value that universities and federal laboratories offer to a best practices incubator. As discussed in Chapter 5, both can serve as sources of new technologies that might be commercialized by incubator clients. However, universities and federal laboratories can also provide valuable services and unique resources to both the incubator and its clients. A list of common resources obtained through these linkages is presented below.

- **Faculty/Technologist Consulting** – Provided on a pro-bono or fee basis, university faculty and laboratory technologists<sup>22</sup> offer both technical and managerial expertise to incubator clients. These relationships provide the client with high-quality technical skills and business knowledge and, in turn, offer faculty/technologists practical experience working in a private market environment. The synergistic relationships that develop often hone expertise on both sides of the partnership, and lead to cutting-edge technology applications and business models.
- **Student Interns and Employees**– While a majority of student intern programs involve students at the graduate level in business, science or engineering, internships also involve senior-level undergraduates. Accelerated activity in the Internet sector has further resulted in incubator clients more often utilizing students in technical disciplines at the undergraduate level. Clients can cost-effectively use students from many disciplines, however, including law, public relations, journalism/technical writing, photography, graphic design, etc. With adequate supervision, whole student teams can take on many useful business projects. The key is motivation and intelligence since, except possibly on the graduate level, experience is not a significant factor. Students are either paid, obtain credit or both, and clients obtain low-cost employees. Thus student interns and student employees can provide a win-win situation for all parties involved.<sup>23</sup>
- **Access to Technical Facilities and Equipment** – Universities and federal laboratories have a wide range of technical facilities and equipment that can expand the resources of an incubator without adding to its on-site development costs. Facilities and equipment are usually provided on a pro-bono or reduced fee

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<sup>22</sup> Access to federal laboratory technologists, facilities and equipment can be obtained by executing a Cooperative Research and Development Agreement (CRADA). These agreements are common with larger corporations, and an incubator may be able to execute a blanket CRADA that allows all its clients to utilize the services provided through the agreement. One of the greatest challenges with these agreements is in identifying the entity that will be accept the legally liability requirement of the agreement.

<sup>23</sup> The Ewing Marion Kauffman Foundation's Center for Entrepreneurial Leadership (CEL) has funded several hundred Entrepreneurial Internship Programs over the past five years at universities, colleges and business incubators. Kauffman requires high standards for funded programs but many have had spectacular results. See <http://www.entreworld.org> for more information.

basis to incubator clients, along with access to on-site technicians who can assist clients in utilizing these resources. In some circumstance an incubator may be able to secure unused equipment from a university or laboratory on a loaned basis to fit-up on-site lab space. Since research universities and federal laboratories are highly knowledgeable about hazardous waste disposal, environmental safety and other areas of concern, technicians in these fields are often available and extremely useful as well.

- **Access to Databases and Researchers** – Universities and federal laboratories often subscribe to database services that would be too expensive for an incubator to access on a limited use basis. Arrangement may be made to allow incubator clients access to these services on a pro-bono or per-use charge with the support of a university or laboratory researcher who is familiar with the service.
- **Access to R&D Financing** – Accessing federal research funding such as that provided through the Small Business Innovation Research (SBIR) program is greatly enhanced when incubator clients submit a joint application with a university or federal laboratory. Other sources of R&D financing may also be available through such a relationship.

Universities and federal laboratories offer many additional services and resources including patent knowledge, alumni who may serve as advisors, business contacts and strategic alliance facilitators or investors, access to a far-flung network of laboratories and technical expertise, and access to investment by university foundations. The value of all these resources can vary by institution and by individual due to a number of different factors including, but not limited to, the university's/laboratory's culture and interests in entrepreneurship and applied research, its policies on non-academic related consulting, the ability of the client to manage and utilize the expertise of the faculty/technologist, the fee structure assigned for outside users, and the ability of the faculty/technologist to work in a private market environment. Research has shown that effectiveness of these services is directly related to the universities/laboratories' affiliation with the incubator.<sup>24</sup> Regardless of the situation, incubator staff will have to manage these services closely to ensure that all parties involved benefit from the experience.

#### **Role in Supporting a Successful Incubator Program**

- Expands business and technical services available to incubator clients
- Offers access to pro-bono and low-cost consulting and employees
- Provides a pool of future employees for client firms
- Provides incubator clients with access to specialist facilities and equipment
- Reduces the development costs of the incubator facility and its clients

**TABLE 6.1: Summary of Best Practices  
University and Federal Laboratory Linkages**

1. Establish linkages with universities and federal laboratories to leverage the valuable assets these entities can provide to incubator clients.
2. Use these linkages to provide clients with faculty/technologist consulting services, student interns and employees, access to technical facilities and equipment, databases, researchers and R&D financing.
3. Ensure that partnerships and linkages provide value to all parties.



## *Best Practices in Action*

### *Louisiana Business & Technology Center, Baton Rouge, Louisiana* Practices Highlighted: *University and Federal Laboratory Linkages*

This 40,000 square foot incubator that opened in 1988 is located in the middle of the Louisiana State University campus. Its concentration is on high technology businesses. LBTC focuses on two primary tasks involving high-tech matters: working with federal laboratories and programs to determine what is available that can be transferred to Louisiana businesses, and scouting Louisiana to figure out businesses' technology problems to determine if NASA or other federal programs can solve these problems. Hence, LBTC considers itself primarily to be a broker of technology and solutions. In other words, LBTC is not a problem-solver per se, but merely a resource to connect those with problems to those with solutions.

LBTC works in conjunction with the National Aeronautics and Space Administration's (NASA) Stennis Space Center to commercialize technology. Eighteen federal agencies (Environmental Protection Agency, U.S. Geological Survey, etc.) maintain laboratories at Stennis, and serve as primary resources for LBTC. The incubator identifies technology that is available through the agencies, and then funnels this technology to appropriate businesses throughout Louisiana. LBTC maintains its own office at Stennis in order to work closely with NASA and the other federal agencies located there. LBTC also helps businesses write and process federal Small Business Innovation Research (SBIR) grants. To date, LBTC has helped about 10 clients and numerous other firms win SBIR grants.

In its effort to determine the technology needs and problems of the state's businesses, LBTC holds about 12 seminars a year. Six are usually in Baton Rouge, and six are held elsewhere across the state. In order to avoid duplicating existing efforts, LBTC networks with other key economic development agencies, Chambers of Commerce and Small Business Development Centers to identify businesses that would benefit from its workshops on how to work with NASA and how to apply for research and commercialization grants. The local businesses are asked to complete a technical request sheet that identifies their needs. Then the LBTC takes the lists of local businesses, screens their situations, and investigates the talent or agency that would be required to resolve the dilemma. LBTC can visit up to 20 companies within a one-week period to work on these technology matters. For example, a machine shop needed a special welding procedure in order to secure a private contract with Exxon. The process required a special metal, so LBTC went to NASA, and an expert in the area sat down with the local businessman to obtain details. Once the details were known, NASA wrote a procedure, and the local business won the contract, adding five more employees as a result. On average, about 100 of these partnerships are developed each year. Having the federal agencies as partners provides a strong resource base for the incubator, and if the resource is not available at Stennis, NASA has resource support from the Kennedy Space Center in Florida, Johnson Space Center in Texas and Marshall Space Center in Alabama. Although NASA serves as the main interface for the incubator, if problems cannot be solved within NASA's domain, it directs the LBTC and its businesses to other appropriate government agencies that might have technical solutions.

LBTC has had concrete results from its programs. In 1999, the incubator assisted 36 businesses in creating and submitting SBIR grants. Nine of these proposals were funded. In addition, 12 NASA CRADAs (Cooperative Research and Development Agreements) were signed. In that same year, the dollar amount in grants and contracts to Louisiana's businesses totaled \$2.2

million. Since the LBTC opened its office at Stennis, it has documented over \$10 million in SBIR awards to Louisiana businesses.

The LBTC does not charge for its services. The incubator is funded through contract dollars from NASA to implement the space agency's outreach program. Additionally, economic development funds come from the State of Louisiana to operate the technology transfer office. LBTC has a contract with the state and a memorandum of understanding with NASA. LBTC accomplishes all of its tasks with a staff of eight full-time employees and eight students, which include four MBAs.

(Source: Conversations with Charles D'Agostino, Louisiana Business and Technology Center Executive Director, May 2000.)

*Lewis Incubator for Technology (LIFT), NASA/Glenn Research Center, Cleveland, Ohio*  
Practices Highlighted: *University and Federal Laboratory Linkages*

This program operates two sites for emerging companies that are clients -- one a laboratory intensive facility at Warrensville and the second, referred to as the software, electronics and communications site. The latter incubator is located on the grounds of the NASA Research Center. The Lewis Incubator for Technology develops links between local businesses and federal research laboratories. It commercializes NASA research, works with local businesses that are developing technology of interest to NASA and identifies local firms interested in receiving technical assistance from NASA. About two thirds of the funding comes from NASA and the other third comes from the State of Ohio.

The incubation program has a full-time technology officer who reviews the technology that has been developed by NASA and tries to identify those technologies that have the greatest commercial potential. This full-time staff person identifies recently established startup or existing firms that might be able to commercialize the high-potential technologies identified at NASA. The program has been in existence for three years and, of the 28 current clients, all but one has an on-going relationship with the NASA laboratory.

(Source: Telephone conversations with Wayne Zeman, Director of LIFT, and Jackie Gardner, Incubator Coordinator, June 2000.)

*Rensselaer Polytechnic Institute (RPI) Incubator Program, Troy, New York*  
Practices Highlighted: *University and Federal Laboratory Linkages*

This incubator provides many services traditional to university technology incubators, but it is distinguished by its close relationship to almost all divisions and departments of RPI. The unique services of the RPI incubator are based on access to both the physical and intellectual resources of the university. Physical resources used by incubator clients include conference and seminar facilities complete with catering; access to the university library; self-service and made-to-order machine shops for prototyping; glass blowing shops; media services for custom photography;

prints and presentation materials; electronic and chemical stockrooms; high volume and color photocopying services; university dining and athletic facilities. The incubator helps client companies access sophisticated university equipment such as electron microscopes and materials characterization equipment; computer graphics and image processing labs; and other equipment that would otherwise be too expensive for a startup firm. When there is a fee for any of these services the incubator client may charge to their university account. The charges are billed back to the firm through the incubator's monthly invoicing process.

The intellectual resources of the university are also extremely important to RPI incubator clients. RPI's Career Development Center acts as a human resources department, helping incubator clients find interns and coop students, as well as full-time permanent, part-time and summer hires. A number of RPI faculty volunteer free consulting time to incubator firms, in addition to those available for paid consulting. RPI administrative departments have helped incubator firms with issues such as regulatory compliance and risk management, patents and licensing and public relations. Research centers on campus are available to help incubator clients with product and process development. In one example, the Center for Advanced Technology in Automation and Robotics used its expertise and expensive robotic equipment to develop a mathematical simulation of a repetitive and difficult assembly process that an incubator company was performing by hand. The simulation data was subsequently used to design a simple machine to perform the assembly process in high volume.

In addition to the traditional economic development mission common to most incubators, the RPI Incubator Program has the added goals of helping to educate RPI students by providing a "living laboratory" and commercializing technologies developed in RPI laboratories. Since the incubator was started in 1980, the living laboratory concept has helped hundreds of RPI students become more aware of entrepreneurship through their work with the incubator and its clients, and two-thirds of incubator firms have been started by RPI faculty, staff, students and graduates based on either specific inventions or on general expertise developed in RPI labs.

(Source: Glenn Doell, National Business Incubation Association Randall Whaley Memorial Incubator of the Year Award Application, 1995.)

*CENTER FOR BUSINESS INNOVATION, KANSAS CITY, MISSOURI*  
Practices Highlighted: *University and Federal Laboratory Linkages*  
*Know-how Networks*

THE CENTER FOR BUSINESS INNOVATION IN KANSAS CITY IS CURRENTLY UNDERGOING COMPLETE RESTRUCTURING AND WILL EMERGE WITH A NEW NAME, MANAGEMENT AND GOALS. IN ITS PREVIOUS INCARNATION, HOWEVER, CBI OPERATED A BUSINESS RESIDENCY PROGRAM PROVIDING INNOVATIVE INTERNSHIPS FOR UNIVERSITY GRADUATE STUDENTS. THE INTERNSHIPS OFFERED EXPERIENCE WORKING WITH AND CONSULTING FOR ENTREPRENEURIAL COMPANIES HOUSED IN THE INCUBATOR AND CLIENT FIRMS LOCATED OFF-SITE. THE BENEFITS OF THE PROGRAM WERE THREE-FOLD AND CREATED A WINNING SITUATION FOR ALL PARTIES INVOLVED IN THE PROCESS:

- Graduate Students – Graduate students from a variety of fields were given the opportunity to apply classroom material to real-world business situations. At the same time the students were exposed to the realities of entrepreneurship. Students gained hands-on experience working with a variety of firms in different stages of development. They were introduced to all aspects of these businesses, not just a specific discipline or subject matter.
- Client/Business – Incubator clients received much more individualized attention and one-on-one counseling. The students were highly motivated and enthusiastic, and the quality of their work was ensured by close supervision by full-time incubator staff. In addition, clients saved valuable dollars at critical stages of their business's development.
- The Incubator – Student participation eased the workload of the full-time incubator staff. In addition, they gave the incubator a generous pool of talented, experienced individuals to pull from for filling full-time staff positions.

The students were each hired to work with incubator staff and clients for approximately 20 hours a week. Each student received a stipend of \$600 a month for his or her work, and up to three credit hours through the University of Missouri at Kansas City. The incubator used the local university and word-of-mouth to find the student employees. The students came from various degree programs and backgrounds, and they were chosen on the basis of the incubator's needs and the opportunity to create a student workforce with diverse skills. The total number of student employees depended on the needs of the incubator at each point in time.

Each student served as a "point" of contact for one business, and assisted the business with any and all relevant/reasonable activities. Student progress was monitored through weekly staff meetings with clients and staff and weekly meetings with their team leaders, which were incubator staff members responsible for monitoring students' work with the clients. At the beginning of the internship, student skills were assessed through a complete and thorough educational matrix. Educational gaps were covered through additional hands-on experiences and guest speakers. Residents leaving the program completed an exit interview that assessed the student's knowledge. The program's interns boasted impressive job placements.

(Source: *Innovative Programs That Help Companies Succeed*, National Business Incubation Association, Athens, Ohio 1997.)

*Software Business Cluster (SBC), San Jose, California*

Practices Highlighted: *University and Federal Laboratory Linkages*

The SBC has a close relationship with San Jose State University due to its role as the host organization for the incubator. As a result of this situation, the SBC has developed working relationships with professors in the business and engineering schools who provide technical support to client businesses. For example, one professor in the business school is a recognized expert in Internet markets and has worked with several SBC clients on a pro-bono basis to assist with market research, product development and product positioning. The SBC also has an internship program; approximately 15 teams of San Jose State MBA students are assigned to clients to assist with market research, business planning, etc. Each team works with a client for one semester, with many students securing employment with the client upon graduation.

(Source: National Business Incubation Association Randall Whaley Incubator of the Year Award Application, 2000, and conversations with James Robbins, Software Business Cluster Director, May 2000.)

**BOULDER TECHNOLOGY INCUBATOR, BOULDER AND LONGMONT,  
COLORADO**

Practices Highlighted: *University and Federal Laboratory Linkages*

Boulder Technology Incubator (BTI) President Jerry Donahue sits on the board of directors of the University of Colorado technology transfer agency, the University Technology Corp. This body meets monthly, says Donahue, “so I’m pretty much on top of what’s coming down the transom.”

(Source: Telephone conversation with BTI President Jerry Donahue, June 2000.)

## chapter 7: facility basics

### overview

The term incubator has long been synonymous with a facility-based program. *Virtual* or non-facility based incubators also exist, and have recently garnered renewed interest as practitioners have embraced the Internet with new models for business incubation. However, for the purposes of this chapter, the discussion will focus on the facility and its relationship to the incubation process.

A facility-based program can be advantageous when incubating new ventures. From a client perspective, a facility can provide value in four specific areas.

- Image – An attractive facility with a receptionist and conference room makes an impressive statement to potential clients and investors, one that cannot typically be obtained when working out of the home, garage or low-cost office space.
- Operational Efficiency – A facility outfitted with furniture, phone lines and support equipment allows the client to get up and running immediately, pay more attention to their core business and spend less time dealing with operational issues.
- Responsiveness – In a facility with an on-site business coach, the client can quickly obtain assistance in dealing with a specific challenge or need rather than waiting to schedule an appointment. In addition, the on-site business coach may be able to identify an issue before it becomes problematic due to daily interaction with the client.
- Peer Support – Over time, a well run facility-based incubator can develop a sense of community among its tenants that provides an intellectual as well as emotional support structure for clients. Clients also share resources, strategies and technologies.

When siting a new facility or evaluating an existing one, other factors such as image, security, access, parking and proximity to resources (e.g., restaurants, coffee/espresso shops, copy centers, professional services, etc.) are important to ensure that the incubator will provide the appropriate environment for its clients. In addition to location, the following objectives should be considered during design and layout stages of a new facility or renovation project.<sup>25</sup>

- Flexibility – Throughout the incubator's useful life, numerous businesses will enter the building as tenants and exit as successful and growing ventures. During their stay, these businesses will typically increase both the complexity and size of their operations, placing additional demands on the incubator to meet their needs. Reconfiguration of space and installation of additional telecommunications lines or circuits to handle increased power will occur frequently and must be considered during design and layout. Flexibility should be a primary

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<sup>25</sup> Wolfe, *Technology Innovation Centers: A Guide to Principles and Best Practices*, p. 43.

consideration, and multiple phone and power closets and zoned HVAC should be considered to meet this objective.

- **Interaction** – As noted in Chapter 4, effective incubators establish a sense of community among tenants. This is achieved through programs and by using a layout that encourages interaction. Long, sterile hallways and minimal shared areas designed to optimize the amount of rentable square feet may be beneficial from a revenue perspective but do not support client synergy. Consequently, incubator developers should include a reception area, kitchen, copy room, and meeting rooms in their design. These areas should be positioned—along with mailboxes and bathrooms—so that clients are forced to venture out of their own space to interact daily with others.
- **Financial Sustainability** – Long-term financial sustainability is a challenge for incubators. Those dependent on rental income for a significant portion of their operating revenue must ensure that the quality of the space is consistent with the rental rates to be charged, and that there is sufficient rentable space (excluding common areas) and market demand to meet revenue projections.

Specifications for incubator design and layout vary by project. The following specifications are provided as suggestions,<sup>26</sup> and should be refined with architectural and engineering professionals to meet the incubator's client needs. The information reflects configurations for office, light manufacturing and laboratory space that can be mixed and matched as necessary. It should be adapted according to the intended layout.<sup>27</sup>

- **Space Configuration** – Space should be configured to maximize interaction among clients and to provide the greatest flexibility for handling emerging company needs. Office space should be configured in 100 sq. ft. to 300 sq. ft. hard wall offices with locking doors between some of the spaces to allow a single user to expand easily. Although cubicle space is less costly to develop, incubators find it difficult to rent due to client concerns with security and protecting intellectual property.

Light manufacturing space should be configured into 800 sq. ft. to 1,200 sq. ft. units with a small office space. Each space should have a roll-up door with access to a loading dock. This may be accomplished by fronting the roll-up doors onto a centralized corridor that accesses a common loading dock.

Laboratory space should be configured into single units of approximately 400 sq. ft. to 600 sq. ft. with adjoining doors on some units to allow for expansion up to 1,200 sq. ft. Clients utilizing laboratory space will also need office space to handle other aspects of their business.

- **Common Areas** – An incubator should have common areas providing amenities for smooth business operations. A reception area, kitchen (with refrigerator, vending machines, soda machines, microwave, coffee, etc.), copy room (with high-speed copier and production area), computer lab, conference room (which can also double as a training

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<sup>26</sup> All projects should conform to local building codes and design guidelines for permitted uses.

<sup>27</sup> Wolfe, *Technology Innovation Centers: A Guide to Principles and Best Practices*, p. 44.

room), and meeting/presentations rooms. Common areas should be centralized to encourage client interaction.

- Shared-Production Areas – Some incubators may provide value by offering clients access to shared-use equipment and test facilities such as precision and tooling labs for prototype development, electronics test labs, wet labs, etc. These should be integrated into the facility design, both to encourage use and promote firm interaction.
- Storage – Many incubators overlook the need to provide storage space for clients and the incubator itself. Since most clients will maximize use of their primary space, centralized, secure storage areas can be very valuable.
- Communications/Network – An incubator should provide advanced communication services through an internal Local Area Network (LAN) with enough access ports to support client businesses. Cabling in the incubator should be Category 5 or better, and the incubator should offer its clients access to T-1 service or better depending on client needs.
- Security – An incubator should offer a secured facility with 24 hours access, seven days a week. The system should permit addition and deletion of users as clients enter and graduate. Key cards currently provide an effective solution for security. However, new security technologies should be considered.
- HVAC – HVAC should be zoned for flexibility in the use of space. Work areas, light manufacturing and laboratory units should each have their own systems that meet air quality standards for intended use of the space and control airborne contamination. HVAC should also allow clients to override the program during after-hours and weekends.
- Electrical – Sufficient electrical power should be provided including 3-phase power for light manufacturing operations. Electrical power in offices should be distributed in zones so that space can be reconfigured as required. Light manufacturing and laboratory spaces should be individually metered, and the cost of distributing power within these spaces should be borne by the client. Architects and engineers must take into consideration the fact that early-stage businesses may utilize more power per square foot than conventional businesses.
- Plumbing/Sewer – Plumbing and sewer system design should meet the incubator's specific needs. Light manufacturing and laboratory space should—at minimum—have water and sewer stubbed out to each unit. Attention must be given to how hazardous materials will be handled and design should incorporate waste containment systems (including floor drains).
- Parking – Incubators typically have higher demands for parking due to the typical client's desire to house as many individuals per square foot as possible and to due the likelihood of numerous outside visitors and customers. Four to six parking spaces per 1,000 sq. ft. of rentable space are recommended for office space vs. three to four spaces per 1,000 sq. ft. for light manufacturing.
- Special Features/Considerations – Special features that might be suitable for an incubator facility are listed below.
  - Access points/corridors of sufficient size for moving equipment and materials into labs
  - Animal storage and handling area
  - Compressed air to each unit

- Corridor widths suitable for forklifts
- Gas to each unit
- Hazardous materials storage and handling area
- Inside and outside recreation areas
- Loading dock(s)
- Roll-up doors to each unit (to the exterior of building or to a central corridor)
- Safety wash
- Test lab with RF shielding

Client businesses may pay for improvements to meet their specific needs. However, the incubator should avoid making any investments or admitting clients that are not compatible with the incubator’s broader objectives and mission.

**Role in Supporting a Successful Incubator Program**

- Enhances the image of the client’s business
- Provides an environment for stimulating interaction between clients
- Allows for the timely identification of needs and mobilization of solutions
- Reduces the time and cost associated with starting up a new venture

<p><b>TABLE 7.1: Summary of Best Practices Facility Basics</b></p> <ol style="list-style-type: none"> <li>1. Ensure flexible space and the necessary amenities (e.g., high-speed communications, parking, security, etc.) to meet the needs of different clients at various stages of their development.</li> <li>2. Encourage client interaction through the use of common meeting areas (e.g., kitchens, mail rooms, copy rooms, etc.).</li> <li>3. Provide sufficient leasable space for the incubator to reach financial</li> </ol>
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*Best Practices in Action*

Facility practices have been grouped in categories to show how incubators have utilized them.

**Designs to Encourage Networking**

*University of Nebraska Technology Development Center, Lincoln, Nebraska*

This is a 28,000 square-foot, horizontal, single-floor incubator. The design requires people passing each other in the halls, promoting a family-type atmosphere.

*Massachusetts Institute of Technology, Boston, Massachusetts*

The horizontal structure promotes more networking than a vertical layout with small floor areas that provide less research variety on each floor. Its layout includes five low narrow wings that

give good daylight throughout the building and also provide courtyards between the wings that could be utilized through future construction.

*BioScience Enterprise Centre, Halifax, Nova Scotia*

A quiet coffee shop with walls decorated with art gives clients an inviting place to chat with colleagues.

*eHatchery, Atlanta, Georgia*

Entrepreneurs at this incubator hold impromptu meetings atop bar stools that surround a fifteen-foot-long wooden bar. Clients work in a large space separated only by occasional three-foot walls in order to promote an open look.

*Ben Craig Center, Charlotte, North Carolina*

A courtyard between the two sides of the “V” shaped building draws clients outside to meet informally. Red maples invitingly shade the tables and chairs.

### **Flexible Space Design**

*BIO/START, Cincinnati, Ohio*

The incubator manager closely studied potential biotech clients’ needs before deciding on a final mix of spaces, which includes five offices of 100 square feet, eighteen wet labs of 450 square feet to 1,100 square feet, four dry labs of 450 square feet to 800 square feet, and six tissue culture labs of 100 square feet, in addition to many offices. BIO/START also has shared labs.

*Long Island High Technology Incubator (LIHTI), State University of New York at Stony Brook, New York*

This incubator features two sizes of laboratories, 500 and 700 square feet, with the ability to bring two contiguous spaces together when a company needs to expand.

*Gulf Coast Business Technology Center, Biloxi, Mississippi*

The incubator offers 69 client offices ranging from 150 square feet to 450 square feet. Firms can combine rooms to make suites. Manufacturing areas vary from 700 square feet to 1,400 square feet.

*Santa Fe Business Incubator, Santa Fe, New Mexico*

This incubator has six large “pods” of about 800 square feet that can be divided in half or quarters by adding walls with metal studs, sheetrock and doors into the hallway. Each pod has its own heating, ventilation and air-conditioning (HVAC) unit. Plans for future door locations and extra electric outlets, phone outlets and light switches were based on the assumption that the spaces might be divided into their smallest components. Additionally, the 850 square foot production units can be divided in half.

*Cambridge Incubator, Boston, Massachusetts*

E-commerce incubators make creative use of open floor designs that let entrepreneurs easily converse and see each other at work. Office bays with translucent walls open into generous common space. This design feature accommodates the incubator’s fast-growing startups.

### **Shared Facilities**

*Advanced Technology Development Center, Warner Robins, Georgia*

In 1991, the City of Warner Robins built the 36,000 square foot building and leased it to ATDC, which manages both the common areas and an incubator program that takes up 10,210 square

feet. The building also is home to a junior college and the Georgia Tech Research Institute. Having the three organizations under one roof creates a buzz of activity and an awareness of small business activities.

*MGE Innovation Center, Madison, Wisconsin*

MGE has developed economies of scale in building an incubator within a large multi-tenant building. The Center opened in March 1999 and occupies one-half of a 64,800 square foot building. The remaining half houses established companies. The incubator lease rates can be lowered if the cost of the infrastructure – common areas, staff offices, and phone and data systems, for instance – can be recovered from more tenants and leased square footage. In this case, the incubator's rates are six percent less than they would otherwise be because of the ability to spread these costs over the entire building rather than just the incubation program.

**Communications Infrastructure**

*Ehatchery, Atlanta, Georgia*

This 25,000 square-foot e-commerce incubator has six T-1 lines, including a direct line to its off-site Web hosting facility.

*Cambridge Incubator, Boston, Massachusetts*

Each office bay has 20-30 Ethernet data jacks, and overall the facility boasts well over 600 jacks. Clients or visitors working in any of the incubator's common areas can easily plug in their laptops. For even greater ease and efficiency, the incubator is looking into a wireless system.

(Source: *Bricks & Mortar: Renovating or Building a Business Incubation Facility*, National Business Incubation Association, Athens, Ohio, May 2000.)



## chapter 8: Governance and Staffing

### overview

The success of any new venture is contingent on many outside factors including market forces, technological advances and capitalization. The strength, tenacity and adaptability of the venture's internal leadership and organizational framework—and their ability to execute—are the critical determinants of success, nevertheless. Those involved with an incubator must embrace the same standards. Raising capital, adapting to changing markets, responding to technological advances, rolling out a product and executing the business model are as important to a successful incubator as they are to the ventures it serves. Consequently, an incubator must create a legal structure that will allow the organization to achieve its mission and a board of directors and management team with the leadership capacity to meet the many challenges the incubator will face.

***TAX STRUCTURE – THE INCUBATOR'S LEGAL STRUCTURE WILL BE INFLUENCED BY ITS MISSION (SEE CHAPTER 3: CLIENT CAPITALIZATION AND FINANCING) AS WELL AS THE FINANCIAL MODEL SELECTED TO SUSTAIN ITS OPERATION (SEE CHAPTER 6: UNIVERSITY AND FEDERAL LABORATORY LINKAGES). AN INCUBATOR CAN PURSUE NONPROFIT OR FOR-PROFIT TAX STATUS, AND SHOULD EVALUATE THE OPTIONS UNDER EACH WITH EXPERIENCED LEGAL COUNCIL.***

- **Nonprofit Structure**

Nonprofit tax structure offers numerous benefits over for-profit status. Corporations formed under Section 501(c)(3) of the Internal Revenue Code have the greatest benefits. Contributions to the incubator can be deducted, and the incubator will be exempt from most corporate income, real and personal property taxes. Obtaining 501(c)(3) status requires that the incubator be established specifically for educational or public benefit purposes, however.

A number of incubators have chosen to operate under the 501(c)(3) umbrella of an existing nonprofit corporation, which serves as a host organization for the incubator. Host organizations can include universities, foundations and economic development corporations (EDC). These relationships can be rewarding, but can also present problems related to conflicting missions, micro-management on the part of the host, etc. Consequently, the requirements and expectations of both parties must be clearly defined and understood before entering into a relationship. Incubators that have excelled under this type of arrangement have had powerful champions within the host organization and have been given significant autonomy over their own operations.<sup>28</sup>

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<sup>28</sup> Ibid., p. 29.

- **For-Profit Structure**

Incubators pursuing for-profit tax structure have several options to consider including “C” Corporation, “S” Corporation or Limited Liability Corporation. The recent boom in private incubators organized around venture capital funds (e.g., idealabs! and eHatcheries) presents another option involving the use of a limited partnership structure. However, incubators established under this legal structure may not conform to the U.S. Internal Revenue Service *limited-life-test*<sup>29</sup>. Thus this option should be undertaken only with the guidance of experienced legal council.<sup>30</sup>

***BOARD OF DIRECTORS – STRONG LEADERSHIP AND SUPPORT FROM THE BOARD OF DIRECTORS IS ESSENTIAL. IN ADDITION TO ITS LEGAL RESPONSIBILITIES, THE BOARD MUST PROVIDE STRATEGIC DIRECTION AND LEADERSHIP, AND SUPPORT THE INCUBATOR DIRECTOR IN PERFORMING HIS OR HER DUTIES. BOARD MEMBERS SHOULD BE SELECTED FOR THEIR INTEREST IN SUPPORTING THE ORGANIZATION’S MISSION. INDIVIDUALS WHOSE PRIMARY FOCUS IS PERSONAL BENEFIT OR PROMOTING A PERSONAL AGENDA CAN BE DEVASTATING TO INCUBATOR EFFECTIVENESS.<sup>31</sup> A DETAILED ARTICLE ON BOARD RESPONSIBILITIES AND SELECTION IS INCLUDED AS APPENDIX B3.***

The discussion that follows reflects the roles and responsibilities of a board for a nonprofit incubator, and may be inappropriate for for-profit incubators. Incubators that operate under a nonprofit host will have to report to the host’s board of directors. However, programs operating under a host should also establish an advisory board to provide strategic direction and support.

- **Board Responsibilities**

Nonprofit boards have many responsibilities, all of which have an underlying objective, which is to ensure—to both clients and the stakeholders—that the incubator attains its mission. These are highlighted in Table 8.1.

**Table 8.1: Board Responsibilities<sup>32</sup>**

1. Develop and update a strategic plan for the incubator
2. Serve as the liaison with government representatives for publicly supported incubators
3. Market the incubator to potential stakeholders and client businesses

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<sup>29</sup> The basic premise of the *limited life test* is that the firm’s charter would define a set life span or contain a provision for dissolution if there is management turnover.

<sup>30</sup> Wolfe, *Technology Innovation Centers: A Guide to Principles and Best Practices*, p. 30.

<sup>31</sup> *Ibid.* p. 30.

<sup>32</sup> Rice, p. 49.

4. Support the incubator’s director in establishing and managing the professional services network, mentor network, investor network, etc.
5. Support the operation of the incubator and monitor incubator budgets
6. Support fundraising activities
7. Support the development of successful client businesses

In addition to the basic responsibilities cited above, we would add *hiring the incubator CEO or director*, which we believe is absolutely critical to the incubator’s success. The board should also approve major policies and ensure that the director stays focused on his or her own responsibilities to the incubator and its clients. The board can – by its own actions – place significant time demands on the director and his or her staff by holding frequent board meetings.<sup>33</sup> In addition, directors of successful incubators can be distracted by outside demands – such as serving on boards, hosting visitors and instructing entrepreneurship classes – that may be more enticing than dealing with unappreciative clients but provide marginal benefit to clients. Many of these activities are worthy causes, but staff time is a limited resource for most incubators, and the board should assist in fulfilling these obligations.<sup>34</sup>

- **Board Size and Composition**

Board size and composition should reflect the incubator’s needs at various stages of development. Initially, the board should consist of the smallest number of members necessary to carry out its duties in terms of strategic direction and support to the director. Additional members should be added to meet the needs of the incubator over time.<sup>35</sup> However, the center must “calculate the time that will be required by the incubator’s director and staff to support each additional member vs. the benefits that person can provide to the incubator and its clients.”<sup>36</sup> The board of a successful incubator will include a mix of individuals with different characteristics and skills (see Table 8.2).

**Table 8.2: Optimal Board Composition<sup>37</sup>**

1. Leaders or champions with a clear vision of the incubator’s mission, and the capacity to motivate and sustain the board’s commitment to its mission

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<sup>33</sup> Monthly board meetings are common during the start-up phase of an incubator or during a crisis situation. However, there are diminishing returns if staff spends too much time preparing for board meetings instead of serving clients.

<sup>34</sup> Rice, p. 53.

<sup>35</sup> A typical board ranges in size from seven to 25 individuals. Larger boards establish executive committees of five to seven people to deal with the more operational aspects of the incubator.

<sup>36</sup> Rice, p. 58.

<sup>37</sup> Ibid., p. 57.

2. Networkers or professionals with investment and professional services community connections
3. Business operations and real estate professionals who can assist the director with the facility operations and management
4. Service providers and mentors who can advise client businesses and facilitate the use of resources
5. Venture capitalists, angel investors and bankers who understand new venture equity and debt financing
6. Entrepreneurs who have developed successful ventures and who can ensure that the incubator's services are responsive to its clients
7. Technologists who can assist the director in evaluating the technical components of a new venture applying for assistance from the incubator

***MANAGEMENT TEAM –THE BOARD SHOULD HIRE AN EXECUTIVE DIRECTOR OR CEO DURING THE EARLY STAGES OF DEVELOPING THE PROGRAM, AND THIS PERSON SHOULD ASSIST IN OPENING THE INCUBATOR AND HIRING AND SUPERVISING ADDITIONAL STAFF. TOTAL STAFF NEEDED TO OPERATE AN INCUBATOR WILL VARY BASED ON THE LEVEL OF SERVICES PROVIDED, THE NUMBER OF CLIENTS SERVED AND THE SUPPORT PROVIDED BY THE BOARD AND STAKEHOLDERS. A SURVEY OF CALIFORNIA TECHNOLOGY INCUBATORS SHOWED THAT THE AVERAGE INCUBATOR OPERATED WITH FOUR FULL-TIME STAFF MEMBERS AND TWO-AND-A-HALF PART-TIME STAFF.<sup>38</sup>***

- **Overview of Staff Positions**

Overviews of the position of director and administrative assistant/receptionist are highlighted below along with a brief discussion on the role of volunteers and interns. Facility-based incubators will also need a facility manager if a board member cannot fill the responsibilities of this position.

- **INCUBATOR DIRECTOR**

The director must be a dynamic individual with business experience in the cluster(s) to be supported by the incubator. The director must be able to effectively market the incubator to potential client businesses, financial sponsors and stakeholders, including local professionals and industry specialists, investors, corporate CEOs and foundation managers. The director must also be able to coach client businesses, identify their needs and facilitate the use of outside resources. The director should have responsibility for hiring and for the incubator's operations and finances. The director must be able to work with the board to impart the vision of

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<sup>38</sup> Based on results of a survey conducted by Claggett Wolfe Associates of 18 technology incubators in California, 1999.

the incubator and its mission to the general public and, through the selling of that vision, enlist support. Additionally, no single individual can be expected to be fully knowledgeable in all aspects of entrepreneurship required to help ventures. Therefore, the director must understand what is needed and be able to bring in outside assistance to fulfill these needs.<sup>39</sup>

- **ADMINISTRATIVE ASSISTANT/RECEPTIONIST**

The administrative assistant/receptionist must handle the administrative and clerical duties of the incubator, typically involving light bookkeeping, scheduling events, responding to initial inquiries from potential clients and assisting existing clients with basic services and information. Additional roles and responsibilities include providing support to the director and to client businesses (on a fee-for-service basis for the latter). The individual must be adept at multi-tasking, be cheerful and an excellent facilitator, possess excellent computer skills (word processing, document formatting, and spreadsheet proficiency) and English language skills. As the incubator develops, the receptionist tends to be almost fully engaged in the details of mail, office equipment, and answering questions from tenants and the general public. Intern and trainee assistance will become essential over time.<sup>40</sup>

- **VOLUNTEERS AND INTERNS**

Volunteers from the community, industry, colleges and other resources will be invaluable to incubator management. They require significant levels of oversight and training, however, which can consume staff time. As a result, this task should be delegated to a member of the board, a senior graduate student intern, or a senior volunteer experienced in managing an ever-changing team of individuals. Volunteers may be used as office assistants, facilities managers or business experts. Matching these resources with the needs of each client business is a complex process and should be carefully coordinated to ensure value to both parties.

Paid internships can alleviate the workload of both the director and the administrative assistant. However, interns, like volunteers, require significant levels of oversight and training. In addition, recognition must be given to the temporary nature of their commitments. Internship programs through local colleges and universities may offer free assistance to the incubator, but their involvement must be of sufficient complexity to meet their class requirements. Interns cannot be used solely for administrative tasks or other non-technical duties.<sup>41</sup>

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<sup>39</sup> Wolfe, *Technology Innovation Centers: A Guide to Principles and Best Practices*, p. 32.

<sup>40</sup> *Ibid.*, p. 33.

<sup>41</sup> *Ibid.*, p. 33.

- **Staff Compensation**

Limited budgets and a nonprofit/public sector mentality lead many incubator boards to offer compensation packages that are not competitive with fair market rates for similar experience and skills. To attract and retain the type of talent needed to sustain a successful incubator, however, the board must offer competitive compensation and benefits packages.

Base salaries for incubator directors range from \$50,000 to \$100,000—excluding benefits.<sup>42</sup> This is significantly lower than similar positions in private sector firms. Lack of competitive salaries has major impacts on incubator success. Some individuals will be attracted by the pure benefits of working with early-stage technology ventures, contributing to the community, or the recognition and prestige attached to the incubator. Regardless of the reason, lacking appropriate compensation, most talented people will eventually be drawn away by more lucrative offers.

Incubators that sign equity or royalty agreements with clients may be able to recruit a talented director by offering them a percentage of return from the incubator's investment pool, in the same way that managers of venture capital funds receive compensation from an incentive bonus pool. The use of equity and royalty agreements is still in the early stages of development for most publicly supported programs, however, and it raises issues related to conflicts of interest that could affect the incubator's tax status.<sup>43</sup> Incubators that choose to pursue this type of compensation package should consult compensation specialists, accountants specializing in nonprofits and legal counsel before adopting this option.<sup>44</sup>

### **Role in a Best Practices Incubator**

- Ensures tax status required to meet the incubator's agreed-upon mission
- Ensures that both board and management achieve consensus on a mission
- Promotes acquisition of management with the skills necessary to meet the mission and help companies grow
- Ensures maximum return on investment in limited, valuable resources
- Promotes retention of quality staff

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<sup>42</sup> Based on results of a survey conducted by Claggett Wolfe Associates of 18 technology incubators in California, 1999.

<sup>43</sup> Several publicly supported incubators have adopted royalty and equity agreements, but the jury is still out as to the success of these programs. Challenges include the initial valuation of the company and the associated value placed on the services provided by the incubator, the timing of royalty payments and their impact on the business's ability to grow during its early stages of development, the potential impact of these agreements on the firm's capacity to raise additional equity capital or to negotiate the acquisition of the business by another firm, etc.

<sup>44</sup> Wolfe, *Technology Innovation Centers: A Guide to Principles and Best Practices*, p. 33.

**Table 8.3: Summary of Best Practices  
Governance and Staffing**

1. Ensure that the incubator has an effective governing body including private-sector perspectives.
2. Achieve consensus among staff and major stakeholders on the mission of the incubator.
3. Ensure that the incubator's president/CEO has appropriate skills and is capable of helping companies grow. Ensure that staffing is sufficient, that certain staff is designated to work primarily and directly with client services and that those people have the highest qualifications.
4. Hire entrepreneurial presidents/executive directors capable of identifying client needs and matching them with a wide range of resources, and ensure they do this without impeding the client's need to learn or diminishing the client's responsibility for

## chapter 9: client screening and graduation

### overview

Client selection and graduation are critical to a successful incubator. The process should be customized to meet the incubator's mission and ensure that firms that make it through the screen can benefit from its value-added services.

During early stages of incubator development, it is important to balance expectations with market perceptions. When the incubator first opens it may lack the credibility needed to attract the best clients. There may be exceptions to this rule, especially with incubators that are formed with a significant source of equity capital behind them such as ideaLabs! of Pasadena, California. However, without this strategic advantage, it could take two to three years before the incubator's true worth is fully understood in the marketplace. Consequently, incubator selection criteria may evolve in response to market conditions.

**Client Selection** – A few basic characteristics of a selection<sup>45</sup> process follow (an incubation program's initial application form is included in *Appendix B4*):

- Incubators should accept a diverse range of clients to increase synergy and diminish direct market competition. This is true for both facility-based and non-facility based incubators, given that intellectual property protection and recognition of potential conflicts of interest must be of concern to the incubator and its staff.
  - Applicants should fall within a broad definition of a for-profit venture producing products or services that can be commercialized within the time permitted for incubation.
  - Applicants should be identified within the technology or other clusters supported by the incubator.
  - The applicant should be early-stage—generally within the first two years of business operations—not yet profitable and still growing. Exceptions may be made for small firms that are changing focus, in a "turn-around" mode, substantially restructuring or launching a new business project.
- Applicants desiring access to an affiliated institution such as a university, federal laboratory or other strategic partner should meet the basic requirements of the partner if a key component of the venture's success involves utilizing partner resources. Qualifications may include limitations on business size and location, citizenship status of owners, intellectual property rights, security clearance to access restricted areas, etc.
  - Applicants must show ability to pay rents and fees charged by the incubator while developing positive cash flow.

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<sup>45</sup> Ibid., p. 51.

- Applicants should present a management team that is capable of handling the technical aspects of the business or understands how to obtain needed technical assistance.
- Applicants should present a management team that is capable of handling the operational aspects of the business or understands how to obtain needed assistance.
- Applicants should identify products, technologies or services that can benefit from the value-added provided by the incubator and its resource network. At the same time, incubator management must feel confident that it has the capacity to help the business succeed.
- Applicants should provide economic benefits in the form of job creation or new business opportunities for community vendors or contract agencies. Alternatively, the business must be developing a product or service that will further the economic objectives of the region.
- The applicant should not be in direct competition with another incubator startup. If such a conflict appears likely, the applicant might be asked to meet with the incubator's existing client business or a review panel comprised of board members to discuss potential conflicts of interest. Views of the existing client and incubator management should be the primary factors in determining the new applicant's admission. An applicant might be admitted if specific conditions can be established to mitigate conflicts and protect intellectual property.

***CLIENT GRADUATION – INCUBATORS SHOULD ESTABLISH GRADUATION POLICIES INCLUDING SPECIFIC CRITERIA RELATIVE TO THE INCUBATOR'S MISSION AND THE INCUBATOR'S ABILITY TO PROVIDED CONTINUED VALUE TO THE CLIENT. THESE POLICIES SHOULD BE INCLUDED IN ALL LEASES AND MATERIALS SUPPLIED TO SERIOUS APPLICANTS, AND MANAGEMENT MUST ENSURE THEY ARE UNDERSTOOD AND ACCEPTED. SAMPLE CRITERIA ARE OUTLINED BELOW.<sup>46</sup>***

Time Limits – An incubator can establish a maximum amount of time for which a client can receive services. This should be customized by cluster and reflect the period in which the client should realistically progress to accelerated growth or be supported by private sector providers.

Resource Commitments – An incubator should establish limits on the resources it commits to any one client. This may be designated in terms of hours of assistance or rentable square feet occupied.<sup>47</sup>

Value – An incubator should make a self-assessment of its ability to provide continuing value to the client. Clients who have progressed beyond the

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<sup>46</sup> Ibid., p. 52.

<sup>47</sup> A rule of thumb with business incubators is to graduate a client when they will occupy more than 10 percent to 15 percent of the total rentable square feet of the facility.

incubator's capacity to provide sufficient value should graduate and begin utilizing private sector providers.

### **Role in a Best Practices Incubator**

- Promotes the mission of the business incubator
- Ensures maximum return on investment of the incubator's valuable, limited resources
- Avoids a misfit between clients and incubator capabilities
- Makes room for a continuing flow of incubator clients and graduates

<p style="text-align: center;"><b>TABLE 9.1: Summary of Best Practices Client Screening and Graduation</b></p> <ol style="list-style-type: none"><li>1. Utilize an extensive screening process to select clients that can benefit from the value-added services the incubator provides.</li><li>2. Ensure that screening processes determine the needs of the applicant, the ability of the incubator to provide value to the applicant and the willingness of the applicant to accept the value provided by the incubator</li><li>3. Establish appropriate graduation criteria.</li></ol>
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## *Best Practices in Action*

*Advanced Technology Development Center (ATDC), Georgia Institute of Technology, Atlanta, Georgia*

Practices Highlighted: *Client Screening*

ATDC operates a four-step due diligence (screening) process before accepting incubator clients, with the goal of identifying firms that fit best with incubator programs and have a good chance of growth and stability. Information gathered in the screening process is also valuable in providing incubator consulting to those who become clients. The due-diligence plan examines and critiques businesses in much the same way any serious investor would, with particular attention given to market analysis. The program is administered in part by graduate students, which gives student employees valuable market analysis experience in the burgeoning technology sector. The screening program is a factor in ATDC's impressive and tangible contributions to the local economy, job creation, and state and local tax revenues. The program also saves time in the long run by maximizing incubator resources.

The program began in 1993, and the current process uses a combination of in-house staff, outside consultants and graduate students. In developing the process, the incubator had found that many early stage companies were often not prepared to conduct an adequate market analysis, and the fact that these were all technology companies compounded this problem. The program is based on a four-step process:

- 1) A simple review by internal incubator consultants, who in this case are industry-experienced individuals with an MBA or mix of technology and manufacturing backgrounds. This is the minimum eligibility requirement stage. To become a member, the project must meet the four pillars of a sound business project: management, money, technology and market. This first stage ultimately means member companies have already extended a fair amount of effort on their projects.
- 2) Graduate students, with guidance of senior consultants, assess in a very general sense the potential market size, need for such a product, marketing strategy, distribution channels and competitive analysis. This assessment, although general, is very thorough.
- 3) If the market is promising, then the third stage is an in-depth telephone interview with the applicant to explore the four pillars in more detail and to address the four characteristics of a "quality" applicant. These are: an experienced entrepreneur or principal willing to hire business management to run the company within a six-month period; proprietary advanced technology; financial resources to sustain operations for a reasonable period; and a market worth at least \$50 million and/or growing at 20 percent and a strategy for capturing this market.
- 4) In the final stage the in-house consultant assembles a review committee of staff and external consultants who can help validate the credibility of the company's business plan. This involves the closest look at the four pillars and determines where the strengths and weaknesses are.

It's important to note that the amount of time spent in the process and which stages they go through varies from company to company for obvious reasons. Clients are accepted on two levels, either as a full Member Company or as a Developing Company. One or more legs of the pillars in the developing companies is weak, and strengthening that leg is the initial task of developing companies. All companies' progress is marked through benchmarks and guided reviews. The process essentially starts the business plan refinement required for small businesses at the earliest stage possible. The incubator spends \$5,000 or less on each due diligence, and the money comes from the budget allocated by the state. The greatest impact has been the ability to attract and build stronger companies that get through the program faster, hit the market, and meet stand-alone or graduation requirements faster and better. It uses the incubator's resources as wisely as possible. The program has even proved to be good for companies that do not get through because it has revealed that some don't have what it takes to survive. ADTC also keeps a running report card of the program's impact, and has found that the companies that have gone through the process are indeed more attractive to investors.

(Source: Adapted from *Innovative Programs That Help Companies Succeed*, National Business Incubation Association, 1997; updated through conversations with Susan Shows, Associate Director, Advanced Technology Development Center, May 2000.)

#### *AUSTIN TECHNOLOGY INCUBATOR, UNIVERSITY OF TEXAS AT AUSTIN, AUSTIN, TEXAS*

##### Practices Highlighted: *Client Screening*

ATI's screening process is quite exhaustive but is designed to ensure the quality of new tenant companies. This process is described in detail on ATI's Website at <http://www.ic2-ati.org/admission.htm>. First, the company must submit an executive summary to ATI by email or hard copy. ATI conducts an internal review within one week. If the evaluation is positive, a presentation is scheduled within another week. In this presentation, the prospective company must make a 10-minute PowerPoint presentation that covers the business plan. If they pass over this hurdle, the company must present their business idea to ATI's success committee, which consists of external industry experts. The success committee meets one or two times a month; thus, it normally takes only two to four weeks before this presentation can be scheduled. Following are ATI admissions criteria:

- *An innovative, technology-based product idea or business concept* – Telecommunications equipment, Internet, biotechnology and energy related technologies are among several that ATI targets. ATI does not generally accept service-oriented business and prefers a proprietary technology.
- *The beginnings of a sound management and/or product development team* – ATI helps build teams but prefers being presented with a good core team.
- *Six months of working capital* – ATI requests that companies have sufficient capital to carry the business forward for six months.
- *A product that is less than 18 months from market* – ATI prefers not to support companies still in early-stage, lengthy R&D.

- *Realistic financials demonstrating significant revenues within the first five to seven years* – ATI prefers companies with the potential to reach \$100 million in revenues within seven years.
- *A desire to leverage services offered by ATI* – The incubator recruits only companies that possess a real need for services provided by the incubator and that demonstrate receptiveness to ATI input.

The incubator accepts both on-site and affiliate clients. ATI conducts due diligence on the company, the management team, the industry and current and future competitive elements facing the business through the application process on an “as-needed basis.” The incubator will not sign any non-disclosure agreements. According to the ATI Website, the approval process can take as long as six weeks, depending on the preparedness of the prospective company.

ATI requires rent, service fees and equity participation in all accepted companies. On-site companies pay market-rate rental rates, while off-site firms pay a service fee. ATI assumes a one percent (1percent) equity interest in every new resident company. The equity interest is taken in the form of options or warrants. The incubator also requires clients to participate in its networking program and reserves the right to terminate companies that do not participate and do not “strive for success.”

(Source: Adapted from Austin Technology Incubator Website, [www.ic2-ati.org/ati-requirements.htm](http://www.ic2-ati.org/ati-requirements.htm), June 2000.)

*Incubator for Technological Entrepreneurship at Kiryat Weizmann (ITEK), Ness-Ziona, Israel*

Practices Highlighted: *Client Screening*

ITEK projects must have worldwide market potential, be based on groundbreaking new technologies and innovations and result in products that offer benefits to users. All products should also be ecologically harmless. Projects must fit the time frame and budget of the Israeli Incubators Program (see incubator profile in *Appendix A* for more information on program requirements). This can lead to some projects being excluded, although, according to ITEK’s Yerushalmi, biotechnology companies can be funded if it appears that two years of effort will move them along sufficiently that they will be able to obtain follow-on funding by the time government support ends. A firm that subsequently raised over \$20 million is “a jewel in the crown” of the program, he says. The ability of the initiator to conduct and manage the project in its technological aspects is very important.

(Source: Correspondence with Shmuel Yerushalmi, ITEK Incubator Manager, 2000.)

*Rensselaer Polytechnic Institute (RPI) Incubator Center, Troy, New York*

Practices Highlighted: *Client Screening*  
*Graduation*

RPI's Incubator Program doesn't have a formal screening process. Entry requirements include wanting to start a technology company and having a business plan, but if the plan isn't completed Incubator Manager Bela Musits will help the founder write a plan of 10 to 15 pages. Acceptance of the client is at Musits' discretion and often depends on the availability of space. Likewise, there are no hard and fast rules about when companies must exit the RPI Incubator Program, given the wide variety of technology firms accepted. Musits raises the rent every year by 10 percent, but under certain circumstances he will waive the increase. With this increase in rental rates, the companies tend to "graduate" in two to three years. "Not all companies grow at the same rate," he explains. "If a company is working on a new technology, it may take two or three years before they see any growth in their business." Musits has expelled three companies that became stagnant – that were not going anywhere – noting that they may be "ok businesses, but they've outlived incubation." The incubator manager assists these companies and program graduates to find alternative space for their operations.

(Source: Telephone conversation with Bela Musits, Director, Rensselaer Polytechnic Institute Incubator Program, June 2000.)



# Chapter 10: Incubator Evaluation

## OVERVIEW

A discussion of best practices in business incubation would not be complete without a thorough consideration of incubation program evaluation. The NBIA Board of Directors recognized evaluation as a best practice in 1997, noting the need for:

*“maintaining a management information system and collecting statistics and other information necessary for on-going evaluation, thus improving program effectiveness and allowing it to evolve with the needs of the clients.”*

Incubator evaluation can be approached from a number of different perspectives, however. The most common approach focuses on evaluating program outcomes that can be prepared and presented to the incubator’s sponsors, directors, investors and community stakeholders. A second approach, which is more implicit in the practice quoted above, is the evaluation of the program’s adaptability and effectiveness in meeting the evolving needs of its clients from the client’s perspective. Ultimately, the objective is to establish a mechanism for adapting and improving the incubator’s offerings to better meet the goals and objectives outlined in its mission statement.

## BASIC GUIDELINES FOR INCUBATOR EVALUATION

A simple, appropriate evaluation should include collecting outcome data from those served by the incubation program and client feedback about the usefulness and effectiveness of the incubator’s programs and services. Effective evaluation of outcomes can only occur when the incubator’s management has a firm understanding of its mission and goals and can identify those measures that are relevant, given the incubator’s mission. Research conducted by the University of Michigan and others reports that “incubation programs should be compared only with others of similar type and mission. To do otherwise is to compare apples and oranges. Each type of incubator is established to address specific local or investor needs and challenges.”<sup>48</sup> For example, a technology incubator associated with a university might collect data on the number of university technologies successfully commercialized through new company formation. But this same measure would not be relevant to a technology incubator not affiliated with a university. Further, some outcome measures are relevant to private stakeholders or investors including the clients. These include measures of profitability, return-on-capital investment, level of equity investment, etc. Other outcome measures are of more interest to public stakeholders. These include jobs created, payroll and taxes generated and real estate absorbed. A comprehensive list of potential measures is presented in *Appendix B5*.

Finally, to develop feedback on the incubator’s programs and services that can be used to improve them, the incubator must collect evaluations of training programs, mentor

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<sup>48</sup> The reader is referred to a published report of the project, which was funded by the U.S. Department of Commerce’s Economic Development Administration: *Business Incubation Works*, University of Michigan, National Business Incubation Association, Ohio University and the Southern Technology Council, NBIA Publications, Athens, OH, 1997, p. 17.

programs, efforts to assist firms in developing financing, space and facility services and even the skills with which mundane tasks like telephone answering are performed.

Regardless of the approach taken or the information collected, the evaluation process should be manageable in terms of the time and resources needed to execute the data collection effort, to compile and evaluate the results and to develop an action plan for improving operations. Although desired by many sponsors/investors, an overly ambitious evaluation process is likely to require a significant amount of time from the incubator's staff that should be more appropriately directed to assisting clients.

### **Role in Supporting a Successful Incubator Program**

- Provides evidence of success to incubator management, stakeholders and investors
- Allows incubator management to compare program effectiveness with other, like incubators
- Provides evidence of incubation program and service quality
- Provides information necessary to ensure that programs meet client needs and evolve as necessary
- Identifies areas for improvement

### **TABLE 10.1: Summary of Best Practices Incubator Evaluation**

1. Utilize a range of quantitative and qualitative measures to evaluate performance relative to the incubator's mission.
2. Obtain client feedback on the value of the program while they are residents and following graduation
3. Ensure evaluation processes are both manageable and consistent and that outcomes are used to improve incubator performance.

### *Best Practices In Action*

Although the project team did not find a specific program that implemented best practices regarding incubator evaluation, the following profiles present examples of how programs have chosen to evaluate their performance.

*Office for the Advancement of Developing Industries, University of Alabama at Birmingham, Birmingham, Alabama*

Practices Highlighted: *Incubator Evaluation*

The Office for the Advancement of Developing Industries (OADI) at the University of Alabama at Birmingham released an *Economic Impact Study '99* in early 2000. The analysis of OADI's economic study reflects impacts on the Birmingham Metropolitan Statistical Area and, and where possible, the State of Alabama. Dr. S.D. Lee of the

Department of Economics, School of Business, University of Alabama at Birmingham, performed the study.

According to the report, OADI-supported firms:

- Generated \$130 million worth of business in the Birmingham MSA and \$166.2 million in the State of Alabama
- Created about 1,135 local jobs and 1,366 jobs in the state
- Raised \$92 million in grants and capital funding
- Generated payroll of \$25 million
- Generated \$49 million in local income
- Generated more than \$3.6 million in various local tax revenues
- Increased their combined revenue by 93percent

The study also reported, “up to \$133.9 million worth of local borrowing could have been created by local depository institutions due to OADI-related businesses,” resulting in the expansion of business credit within the region.

(Source: “Economic Impact Study ’99,” OADI, University of Alabama at Birmingham, 2000.)

*The Ceramic Corridor Innovation Centers, Alfred and Corning, New York*  
Practices Highlighted: *Incubator Evaluation*

The Ceramic Corridor Innovation Centers “Annual Highlight & Impact Study” for the year ended December 1999 contains an economic development summary that shows how these incubators at Painted Post and Alfred, N.Y., impacted their communities. At a total cost of \$10 million for the project, the incubators have:

- Created 1,775 jobs since the program’s inception April 1, 1992
- Expended an average of \$5,633 for each job created
- Created 20 new businesses
- Graduated 11 businesses

CCIC tenants and graduates have also:

- Generated \$484 million in sales in 1999, and \$884 million in sales since 1992
- Generated \$53 million in payroll in 1999, and \$308 million in payroll since 1992
- Generated in excess of \$6 million in individual income tax in 1999, and over \$20 million in individual income tax since 1992
- Generated an undetermined amount of sales and corporate franchise taxes

The program has also resulted in construction contracts with New York construction companies of \$67 million and municipal infrastructure investments of \$200,000.

(Source: The Ceramic Corridor Innovation Centers “Annual Highlight & Impact Study, 2000.”)

*The Boulder Technology Incubator, Boulder and Longmont, Colorado*  
Practices Highlighted: *Incubator Evaluation*

The Boulder Technology Incubator (BTI) evaluates client and graduate response to its program about every other year. BTI runs focus groups of clients that are facilitated by advisors or board members who are experienced business people. Incubator manager Jerry Donahue refrains from attending the focus groups, in order to avoid biasing participant responses.

The incubator also evaluates itself in relation to five-year projected economic impact goals. For the period 1999-2003, BTI projects total economic development impact of \$1.7 billion, generated through \$269 million in incubator client expenditures, \$137 million in bank deposits; \$243 million in residential real estate investments, \$365 million in commercial real estate investments, \$675 million in employee expenditures and \$17 million in local government revenues. During the same period of time BTI projects program investments of \$2.5 million.

(Source: Telephone conversation with BTI President Jerry Donahue, June 2000.)

## APPENDIX A: PROFILES OF BEST PRACTICE INCUBATORS

### **Incubator for Technological Entrepreneurship (ITEK), Kiryat Weizmann, Ness-Ziona, Israel, managed by Shmuel Yerushalmi, Ph.D.**

ITEK, Ness-Ziona, is a leading Israeli technology incubator, one of 26 founded with the support of the Office of the Chief Scientist, Israeli Ministry of Industry and Trade. Established in 1991, the incubator is associated with the Weizmann Institute of Science, founded in 1934 and bearing the name of Israeli scientist and statesman Dr. Chaim Weizmann, who was the first President of the State of Israel. A Russian educated in England, Weizmann set up the institute to specialize in basic, and subsequently applied, sciences. With a staff of 2,500, the institute is a center of world-renowned scientific research in the life sciences, physics, chemistry, mathematics and computer sciences. The incubator is housed in the nearby Science-Based Industrial Park established in cooperation with the Weizmann Institute at Ness-Ziona. Like its brethren, it receives \$170,000 per year in annual subsidy support from the Office of the Chief Scientist for its own operating expenses.

The mission of the incubators established by the Chief Scientist's Office is "To promote the development of innovative technology ideas of individual entrepreneurs and set up new businesses for their commercialization." According to Rina Pridor, chief of the Incubators Authority within the Chief Scientist's Office, the incubators were established because the Ministry was convinced that "Israel's economic independence is contingent to a large extent upon the development of its technology based industry." Due to the Ministry's desire to import revenues into Israel, the program approves projects that are based on an *innovative, technological idea that will produce a product intended for export*. A company is formed around each idea or concept, with 50 percent of the initial shares going to the project initiator, up to 20 percent of equity going to the incubator, 20 percent going to financiers and 10 percent to key employees. Shareholders' equity ownership is diluted proportionally as additional investment is needed for the company. The government sponsored incubation network is intended only for *individual* entrepreneurs, *not for existing companies*, and a new small company is formed around each approved proposal. Alternatively, companies – existing or new – that want to benefit from government financial support must apply directly through the normal existing channels and cannot receive support through the Incubation Program.

The Ministry provides a no-interest "loan" to each project of NIS (New Israeli Shekels) 600,000 per year for up to two years; this is about U.S. \$150,000 per year. It accounts for 85 percent of the approved budget, so some additional US \$60,000 for the period should be brought in from non-governmental sources. This funding ceases at the end of the two-year period (however, with well controlled cash flow, this period can be stretched for some more months) and the company must stand on its own. While the entrepreneur commits intellectual property and invests work (against salary drawn from the funding) in project development, he is required to make no financial outlays. He may, however bring along the additional non-government funding and will then get an additional 20 percent of the initial shares, instead of an external investor. The funding covers the project's salaries, supplies, equipment, sub-contract services, some basic marketing and overhead.

The government no-interest loan is repaid through a 3 percent annual royalty on sales until it is recouped. In case of failure, the government will forgive the loan. Repayment of the loan is a good indicator of success, by fulfilling national economic goals – creation of industry, job formation, export, influence in the trade balance, payment of taxes, etc. There is no formal limit of time for returning the loan; and this loan system is applied not only to the incubation system, but is the standard for all of Israel's government-supported industrial R&D. The incubators' staff and a resource network of experts are brought to bear to assist the company, and financial statements prepared by the incubator staff are reviewed monthly by the incubator manager and forwarded for approval by the Incubators Authority financial controller. The goal for all projects is that they leave the program with financing or strategic alliances that can continue to carry them forward. In other words, the task of the incubators is to support technological ideas and proposals up to a level that will raise external investment interest.

All the government supported technological incubators are organized as not-for-profits, with volunteer boards and committees, and supportive associations with universities, research institutions and high-tech industry. All have close ties to Pridor, who manages the Technological Incubators Program with a small staff at the Chief Scientist's Office (the Incubators Authority). Since Israel is a small country (500 km by 100 km at its widest), the incubators are all located in relatively close proximity. An additional important feature of the Technological Incubators Program is the "fraternity-like" network of incubators managers who meet every two months, under the Incubators Authority's aegis, each time in a different incubator, for updating of procedures, exchanging of experience and discussion of issues of common interest.

In the first years of the Chief Scientist's program, 95 percent of participants were Russian émigrés, as Israel sought to develop companies with assistance of a huge influx of scientists from the former U.S.S.R. (more than 700,000 Russians emigrated over less than four years, many coming from research institutes and other elite institutions). Now, however, 60 percent of participants are non-Russian. Shmuel Yerushalmi, incubator manager, describes the program as a "technology absorption program, *not* a job creation program." Yerushalmi reported that unemployment was at 8-9 percent at the time of the immigration and a year or two afterwards was down to 6 percent. In fact, the Israeli government was convinced that if it were unable to help the Russians create their businesses in Israel, the immigrants would create companies elsewhere, and then the Israelis would have to compete with them. Interestingly, most of the immigrant entrepreneurs are between 55 and 60 years of age, and, according to Yerushalmi, one of the "most successful" projects was started by an 84 year old.

Like its brethren, the Incubator for Technological Entrepreneurship Kiryat Weizmann provides management support and follow-up, logistics support (floor space, telephone, office services, accounting and legal services charged back to the project at cost), scientific support and guidance and business coordination. The latter includes intellectual property protection, finding investors and strategic partners and securing market channels. These activities require active participation by incubator staff and their resource network since there is no seed or pre-seed venture capital industry in Israel – another justification for the high level of Ministerial support of the new companies.

It is necessary for the incubator to find a suitable business manager to serve as coach and business developer for each project, since most of the project originators are techno-entrepreneurs and will not become the CEO. ITEK often brings in retirees for this purpose, and a volunteer board of directors is set up for each company, with Yerushalmi serving as chairman for each. The incubator manages all company funds from the Office of the Chief Scientist in individual accounts it keeps for each company. External consultants, including in a few cases students at the University of Michigan Business School and others, provide business plans. Although the incubator does not offer a formal training program, lecturers and service providers are brought in for informative sessions on patent law, banking, how to plan for and perform in a trade show, the essentials of a business plan, etc.

The total space encompassed by ITEK is 1,114 sq. m., and it has assisted in creating 33 start-up companies, selected from 950-plus proposals. Of these, 10 are currently in incubation and 23 have completed the program, of which 70 percent are still active (these are March 31, 2000 ITEK statistics). The total private investment (excluding the Israeli national investment) is nearly U.S. \$9 million. As per the standard success measures, a successful incubator project is one that disengaged from the incubator and, at that point in time, was able to continue its business life, either with financial investment, strategic alliance or standing on its own feet by having some sales. Only now is the incubation system starting to evaluate longer-term results.

The government tracks new industries, jobs, exports, the trade balance and taxes paid by new companies to measure returns on its investment. Other national measures of success include the total private investment in these companies – around US \$300 million *after* the incubation period, allied to some US \$30 million during incubation. To this could be added cumulative sales of about US \$100 million – all against total government outlays of US \$170 million for the whole incubation operation from its onset, including projects that failed, projects still under incubation (around 200 projects at any given time) and the incubators' own operating expenses (December 1999 statistics). The equity owned by the incubators is accumulating and rising in value, and it will fund ITEK in future years.

The Israeli Technological Incubators Program and ITEK operate within an Israeli environment that values and encourages volunteer participation to support national objectives, and this is an additional key characteristic of this program. Thus, ITEK is able to identify volunteer board members to bring significant intellectual capital to its projects. Given the considerable support of the Chief Scientist's Office, the relationship between incubators and Office staff is very close and collegial. According to Yerushalmi, they are in constant communication to ensure incubator and project success.

(Source: Adapted from a presentation by ITEK Incubator Manager Shmuel Yerushalmi given in Taejon, Korea, December 1999; correspondence with Yerushalmi, April and May 2000; *Technological Incubators in Israel*, State of Israel Ministry of Industry, and Trade, Office of the Chief Scientist, Jerusalem, 1996, pp. 7-13.)



## **Software Business Cluster, San Jose, California, managed by James Robbins**

In the early 1990's the City of San Jose adopted the moniker "Capital of Silicon Valley" to provide a geographic focal point for the sprawling high technology corridor that stretched around the southern portion of the San Francisco Bay. To further bolster its technology focused economic development efforts, the mayor announced a program in early 1994 to make San Jose the "Software Capital of Silicon Valley" to capture the then nascent software/Internet industry within the region, and to continue its revitalization efforts by bringing high technology companies into the downtown area. Unfortunately, at that time, San Jose had less than 10 software/Internet companies of any significance operating within the city's boundaries, and none operating within the downtown area. At the suggestion of Jim Robbins who had successfully launched the first technology incubator in the region with Digital Equipment Corp., the city sponsored the formation of the Software Business Cluster (SBC) a software/Internet focused incubator to be located in the downtown core of San Jose. Robbins was able to convince the mayor, as well as other city staff, that an incubator could provide the City with a way to "grow its own" software/Internet companies. The incubator could also provide a focal point of activity to supplement other business attraction and software/Internet focused economic development activities.<sup>49</sup>

In the fall of 1994 the SBC opened its doors with 16,000 square feet of space situated in the core of downtown San Jose, and became California's first software/Internet focused incubator. Since that time, the project has been expanded twice and currently operates out of 32,000 square feet at the same location. The goals of the SBC are to:

- *Create an incubator that attracts software/Internet companies to downtown San Jose to assist the City with its goal of creating the "Software Capital of Silicon Valley."*
- *Create a network of business support services that greatly improves the chances for start-up success and growth.*
- *Address the financing needs of SBC start-ups to ensure adequate capitalization during their start-up phases.*

Key elements that have added to the success of the program include:

- A highly successful Venture Capital Referral Program that has resulted in over 80 percent of SBC clients receiving venture capital funding.

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<sup>49</sup> At that time, the San Jose suburbs were viewed as the true centers of new technology development, with sprawling campuses that were not conducive to a downtown setting. Palo Alto (headquarters to Hewlett Packard and home to the venture capital corridor along Sand Hill Road), Cupertino (headquarters to Apple Computer), Sunnyvale (headquarters to AMD and Amdahl), and Santa Clara (headquarters to Intel) all had stronger identities in technology circles and saw steady growth of new technology ventures. Since that time, San Jose has been able to attract the headquarters of Adobe Systems to the downtown and can boast that Cisco Systems and other prominent high technology companies are headquartered in the northern portion of the city.

- Strong financial and political support from the City of San Jose, which has financed the facility with redevelopment funds since the incubator opened. The city allows the SBC to retain the income it generates from charging market rate rents to cover operating expenses.
- A pro-active partnership with San Jose State University, which provides the 501(c)(3) nonprofit umbrella for the SBC through its foundation. San Jose State provides both fiscal and administrative support to the SBC, and the SBC's staff are employees of the university, which allows them to receive the benefits that go along with this designation. In addition, San Jose State serves as a resource to SBC clients by providing student intern teams as well as technical consulting from faculty at no cost to the client.
- Broad-based private sector financial support. Private sector sponsors contributed \$150,000 to assist with the launch of the SBC and there continue to provide contributions to finance special projects undertaken by the SBC. Financial contributions have been received from:

**Partners**

Arthur Andersen & Co.  
 Citibank  
 Compton's New Media  
 Gray, Cary, Ware & Freidenrich  
 Linsay Ferrari  
 Microsoft  
 Pacific Gas & Electric  
 San Jose Redevelopment Agency  
 San Jose State University  
 United Parcel Service

**Sponsors**

Bronson, Bronson & McKinnon  
 Business Resource Group  
 Comerica Bank  
 Cooley, Godward LLC  
 Cornish & Carey Realtors  
 Cupertino National Bank  
 Fenwick & West  
 Hewlett Packard Co.  
 Intel  
 Pacific Bell  
 Ritchie Commercial Real Estate  
 Silicon Valley Bank

- Broad-based private sector supported programs established to assist SBC clients. These programs include the Executive Associate Program, the Brown Bag Lunch Program and others detailed in the best practices sections of this guide.

One would expect that a software/Internet incubator in Silicon Valley would be an instant success. However, the SBC had to overcome some challenges to gain credibility within the region. First, downtown San Jose was not viewed as the appropriate site for software/Internet companies, whose founders typically emerged from the high tech campuses in the more suburban areas surrounding San Jose. Second, due to the world-class resources that already existed in the region, both potential clients and private sector service providers questioned the true value that could be added by a government-supported program. Credit for overcoming these obstacles must go to cofounders Jim Robbins and Barbara Harley and Managing Directors Ross Hunt and Chuck Erickson, who established a quality program that generates phenomenal results both in terms of value to SBC clients as well as value to its stakeholders. Program results include:

- Since its inception in 1994, 33 companies have graduated from the SBC and, as of 1999, 30 (92 percent) are still in business.
- SBC clients and graduates have created over 1,500 jobs.
- 75 percent of the SBC's clients indicated that they would not have started their business in San Jose except for the SBC.
- 70 percent of the SBC clients have remained in San Jose upon graduation.
- Over 80 percent of SBC clients have received venture capital financing totaling over \$300 million (excluding acquisitions and Initial Public Offerings). Most venture capitalists estimate that less than 10 percent of hi-tech companies get such funding in Silicon Valley.
- Three of the SBC graduates went public in 1999 and currently have a combined market capitalization of almost \$10 billion. Larger corporations have acquired two of the SBC graduates, and three additional SBC graduates are expected to go public in 2000.

(Source: James Robbins, application for National Business Incubation Association's Randall Whaley Incubator of the Year Award, 2000, and conversations with James Robbins, May 2000.)

**Panasonic Digital Concepts Center (PDCC), Cupertino, California, managed by James Robbins**

Representing one of the newer models in technology-focused business incubation, the Panasonic Digital Concept Center (PDCC) has been established to invest in and accelerate the growth of digital television, Internet and E-commerce companies. Rather than the typical model of *spinning-out* new technologies, the PDCC was established specifically to *spin-in* new technologies through a series of relationships between incubator clients and Matsushita Electric companies worldwide. Relationships are established in the form of strategic partnerships – technology licensing, co-marketing, co-branding, use of Panasonic distribution channels and manufacturing services, and imbedding client technologies in Matsushita's products. The project is also unique in that it consists of three distinct but interrelated parts.

**Panasonic Internet Incubator (PII)** – The PII is an incubator facility and program that houses 10 to 15 Internet and e-commerce start-ups and emerging businesses.

**Panasonic Venture Capital (PVC)** – The PVC is the direct investment operation of Matsushita Electric Industrial Co., Ltd. Initially, the fund was capitalized with \$50 million with a primary focus on investing in seed-stage and late-stage technology companies. The PVC is located adjacent to the PII and serves as one of the potential funding sources for the PII's clients.

**Panasonic Global Network (PGN)** – The PGN serves as a portal for technology trends in Silicon Valley. The PGN group creates a window between Matsushita Electric companies and Silicon Valley start-ups for collaboration on technology R&D and business strategies. The group also provides business development assistance to

PII and PVC portfolio companies by identifying market opportunities within Matsushita companies worldwide.

Panasonic established the PII in October 1999 in partnership with James Robbins, the developer of the successful Software Business Cluster in San Jose, California. The goal of the Panasonic Digital Concept Center is to:

*Create partnerships with private technology companies to accelerate the development of technologies for the benefit of mankind....*

The PII operates out of 15, 000 square feet of commercial office space in Cupertino, California, and has recently negotiated an additional 6,000 square feet of space within the Women's Technology Cluster in San Francisco, California.<sup>50</sup> As with most technology incubators, applicants must have a sound business concept with sufficient market potential to secure the equity capital needed for growth. However, the PII is unique from a number of perspectives.

- The PII will only admit businesses that present strategic partnering opportunities for Panasonic or one of Matsushita's other companies.
- The PVC has a first right of refusal to purchase a minimum of 10 percent of a client's stock at a price set by the PII client's lead investor.
- Unlike many of the private .com incubators that are forming around the country, PVC makes its investments *after* the client is admitted into the incubator.<sup>51</sup> The investment typically occurs within the first four to six weeks and is made in participation with a lead investor. The PVC will make a commitment to fund a client before a lead investor has been identified to assist the client in negotiating with other investors.
- Through the PGN, PII client technologies are profiled and distributed to appropriate research and product development divisions of Matsushita worldwide.
- Through the PGN, technical specialists, etc., from Matsushita's research and product development divisions worldwide are brought on site to work with PII clients and/or to analyze market opportunities for the client within Matsushita. These guests are housed in cubicle space provided by the PVC.
- Through the PGN, PII clients are sent to Matsushita research and product development sites worldwide to present their technology and to investigate strategic partnering opportunities.
- The PII, PVC and the PGN do not require exclusive rights to PII client technologies, allowing clients to pursue markets outside of Matsushita.
- Matsushita may provide other opportunities to PII clients by licensing technologies and/or providing support by manufacturing products, co-branding, co-marketing, co-distributing or embedding a technology in a Matsushita product.

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<sup>50</sup> The Women's Technology Cluster is an incubator to assist with the formation and growth of woman-owned high technology ventures.

<sup>51</sup> Many of the venture backed .com incubators are the primary investor in their clients and admit the businesses into the incubator as part of the investment package.

The projected stay of clients in the PII is six months to one year with decisions based primarily on company evolution and space requirements. Once the company receives a significant level of equity financing, space requirements quickly exceed the capacity of the incubator. The typical client enters the PII with one to five employees, and graduates once they reach 25 employees. As of April 2000, the PII has graduated three companies and has created over 200 jobs.

(Sources: Interview with Jim Robbins, President, May 2000, and information obtained from the Panasonic Digital Center Web-site, <http://www.digitalconceptscenter.com>.)

**University of California at San Diego CONNECT (UCSD CONNECT), *San Diego, California***

The University of California at San Diego CONNECT program has long operated as a virtual incubator for technology ventures. The program was founded in 1985 at the urging of the San Diego business community with a mission to link high technology and biotechnology entrepreneurs with the resources they need for success – money, markets, management, partners, support services, technology and government. UCSD CONNECT is part of the Division of Extended Studies and Public Service at the University of California, San Diego. When it was first established, the CONNECT program served as an economic catalyst by bringing together the nascent technology industry in the San Diego region. The program faced numerous challenges in gaining credibility with the private sector in its first four to five years of operation. However, the high quality of its programs combined with the dynamic leadership of the organization established CONNECT as the premier organization for supporting high-technology development in the region. Today, industry groups such as the San Diego Software Industry Council and Biocom have been established as a result of the earlier work initiated by CONNECT.

CONNECT accomplishes its goals through educational and networking programs, practical business seminars, technology transfer demonstrations and international strategic and financing forums. CONNECT provides opportunities for the biotech and high-tech communities to learn about research taking place at the university, as well as for the university to learn about research taking place in industry. CONNECT's programs serve business service providers – attorneys, accountants, and marketing specialists – by providing them with knowledge about emerging technologies and access to new business opportunities. The program functions as a catalyst for growth, providing a forum for the exchange of ideas and opportunities to network with peers. This facilitates the ripple effects of success that various high-tech industries have on the communities that support them.

CONNECT's Springboard Program is described among the coaching and facilitation best practices elsewhere in this guide. Other CONNECT programs are highlighted below.

**Front Door** – The Front Door (FrontDoor.org) is in its early stages of development by UCSD CONNECT. However, the concept serves as a good example of a resource that could be provided by an incubator. The program envisions assisting emerging growth companies in their developmental stages by combining staff assistance, training and screening with Web-based directories and tools. At its core, the Front Door will be a central clearinghouse for San Diego's entrepreneurs and the service providers, support organizations and investors that support them. The intent of the program is to maximize each company's ability to achieve funding and success. The Web-based portion of the program focuses on assisting emerging companies in finding information and resources specifically suited for their particular needs. In addition, the program will provide a number of forums and "boardrooms" designed to allow community members to exchange ideas, information, presentations and concepts with other community members. The staff component will provide personalized evaluations, screening and introductions to appropriate services, support and funding resources as well as hands-on coaching and mentoring through existing CONNECT programs such as Springboard and Financial Forum.

**Technology Financial Forum** – The San Diego Technology Financial Forum is designed to provide exposure to the maximum number of new companies and opportunities in the minimum amount of time. The Forum consists of one-day events that feature approximately 30 companies making concise six-minute presentations. In order to present, companies have to:

- Have already received venture capital or significant seed investments
- Be technology related (this includes software, Internet, electronics, computer hardware, telecommunications, biomedical, and bioinformatics)
- Have passed a rigorous selection process and training program

**HR CONNECT** – This program is managed by a steering committee of CONNECT members. It meets quarterly to discuss human resource issues with industry peers and is open to CONNECT members and sponsors only. Non-members are eligible to attend events on a space-available basis. HR

CONNECT's mission is to accelerate the development of technology companies by providing consultation, education, and information exchange through partnerships with human resource professionals, business leaders and UCSD. Events include seminars and roundtables about the HR issues faced by emerging technology companies. Previous topics have included mergers and acquisitions, coaching and mentoring, the 360-degree review process and retention.

**ATHENA** – ATHENA is a separate entity within UCSD CONNECT with its own board of directors and dues structure. The organization was established to facilitate networking among senior women executives and it has evolved into an influential voice for the San Diego technology industry. ATHENA holds networking events at which members can gather to share strategies, victories, challenges and opportunities in a trusted network of peers.

**Most Innovative Products Award** – This program was established to recognize innovative products developed each year by companies located in the San Diego region. Products are evaluated based on the following criteria:

- The product is highly innovative (e.g., it helps the customer perform a task more quickly, more easily, more efficiently or more economically)
- The product represents a substantial advance in technology over what was previously available
- The product has great potential for commercial success

A panel of judges with expertise in a variety of high technology fields selects finalists. A special panel of distinguished individuals selects the winners of the competition from among the finalists.

(Sources: UCSD CONNECT Website at <http://www.connect.org/> and Front Door Website at <http://www.frontdoor.org/>, April 2000.)

**Boulder Technology Incubator, Boulder and Longmont, Colorado, managed by Jerry Donahue**

The Boulder Technology Incubator (BTI) is a public-private business development partnership specializing in technology growth opportunities in the areas of information, process, energy/materials, healthcare and telecommunications. BTI's mission is to speed technology-based startup businesses along the early stages of the growth curve. Its Website ([www.bouldertechincubator.org](http://www.bouldertechincubator.org)) boasts: "By helping entrepreneurs help themselves, BTI clients have a better opportunity to fast track business success." Since the incubator's inception in 1989, more than 50-plus companies have graduated, creating well over 1,000 jobs. The incubator's in-house clients also offer another 150 jobs. All told, the incubator has assisted its clients to raise \$500 million dollars in investment capital, according to its manager, Jerry Donahue. The Boulder program has won prestigious awards, including NBIA's Technology Incubator of the Year award in 1998 and the "Vision 2000" award for best technology business development organization from the U.S. Small Business Administration in 1999.

BTI grew from a feasibility study commissioned by the Public Service Company of Colorado, a gas utility. At the time, Boulder did not have the booming economy it has now. The energy company – supported by other interested entities, including the University of Colorado and Ball Aerospace & Technologies Corp. – suggested that Boulder needed a formal business development program. Incubator supporters chose the technology focus because the Boulder area was home to several university and federal labs that focused on technology innovation, it was felt that technology-based businesses would bring higher-paying positions to the community, and the community already had several successful technology companies. There was a groundswell of support for the project and a long list of public and private benefactors signed on to help fund it. BTI was organized as a 501(c)(6) nonprofit organization. While there was initial concern by some about whether a nonprofit was the best way to support business start-ups, this dissipated as the incubator developed a track record of successful companies.

From the start, the incubator drew dozens of prospective entrepreneurs, even without a formal marketing strategy. About 120 entrepreneurs applied for the program, 12 of which made the first cut. Despite its impressive beginning, however, the incubator fell on hard times in 1991 and 1992 due to an imperfect financial model. After the departure of its initial director, critics multiplied. Then Donahue, who had held executive positions at three medical firms and served as an unpaid consultant to BTI's board of directors in the fall of 1992, conducted an economic study that revealed the incubator's positive results. The impact study marked the end of the incubator's bad news and Donahue officially joined the program's staff as executive director in January 1993.

BTI's reputation draws companies from as far away as New York, Washington, Wyoming and New Mexico, but it primarily serves the immediate community. Though born in Boulder, a few years later it moved to Longmont, about 15 miles away, to a 10,000 square foot facility that includes assembly-manufacturing capabilities. Subsequently the incubator established a second facility in the University of Colorado's

research park and then made another move for its Boulder program, to the University of Colorado East Campus on Marine Street. The Longmont facility serves as headquarters and includes lab areas, light manufacturing-assembly floor space and office suites. Donahue feels the incubator needs a presence in both locales since each has a separate identity despite job migration between the two. While Longmont, a politically conservative city, is eager to grow more business, Boulder, a liberal town, has been trying to reduce low-paying jobs in the city. Further, the university sees the incubator as a way to find commercial applications for technologies and as an educational tool for student entrepreneurs. A third incubator is now planned in the suburban, front range community of Westminster.

Clients spend about two years in the incubator on average. The Longmont facility runs at about 80 percent occupancy, while the Boulder space is overflowing. Despite the high occupancy rates, the incubator doesn't have enough space to generate positive cash flow on its real estate, so it doesn't charge clients based on square footage. Client firms pay about \$500 per month on average for services regardless of the space they take up.

Incubator clients, public monies, corporate donations and professional service firms fund BTI. A recent newsletter cites two sponsors at the \$75,000 level and above, two at \$50,000 or more; five at \$25,000 and up, nine at \$10,000 plus, 13 at \$5,000 and up and many, many more at lesser amounts. Clients – who number between 15 and 18 – contribute about one-third of the funding. BTI also holds equity positions in its client firms, which allows the incubator to charge lower monthly fees to clients and helps keep company cash flow up. Besides seeking routine pledge donations, Donahue also works on a contract basis for corporations, helping them develop innovative small businesses within their larger companies. This makes up the final piece of the fund-raising pie.

BTI is known for “putting good advisors around people” and attributes its success to its team of employees and advisors (see Chapters 1 and 2 for more detailed information on BTI's advisory boards). The incubator employs five and a half staff members who cover both facilities. There are two office managers – one for each location – a receptionist, a student intern and, in addition to Donahue, an executive vice president. This individual coordinates entrepreneurial development and training programs, performs initial client screening and manages the admissions process. A 34-member board of directors is composed of community business leaders including bank presidents, partners in major accounting and business advisory firms, technology companies, entrepreneurs, attorneys and government representatives.

There are always companies vying to get into BTI, in large part because it has made a concerted effort to keep the program and its accomplishments in the public eye. The incubator keeps an up-to date, informative Web site and hosts a lecture series with nationally known speakers. In addition, a public affairs firm donates time to BTI, landing the incubator companies in the news almost every week. This helps attract high-quality clients, advisors and investors. Though BTI never planned to focus on information technology, it has drawn its share of clients and applicants from that field, particularly in software. It also attracts biomedical and environmental technology companies.

Donahue prefers to work with clients that are sited in the incubator but it normally has two or so off-site clients, who receive all the same services that in-house entrepreneurs do. Being located on-site means that incubator clients are exposed to more of the incubator's resources, but it's impractical for some companies who need model shops or machinery that cannot be accommodated.

Additionally, BTI has established a small venture capital fund to lend support to up-and-coming businesses. The fund also helps leverage outside investment capital. Each company that comes in gets a tailored set of business services, designed for its stage of development and needs.

Though BTI has scored success, obstacles and future challenges exist. The Longmont area is running out of developable land to accommodate new businesses, so finding a site for a new company graduating from the incubator is challenging. There is already a space crunch in Boulder. BTI will also have to build a larger venture fund to meet the increasing financial requirements of starting a new business. Donahue says that finding enough quality business opportunities is a challenge, but even with the right deals in hand, there is never enough investment capital to sink into those companies.

Because the Boulder area has a fully employed work force, there are those who sometimes ask why public funds should continue to be used to support BTI. But the incubator has always responded with the argument that it's raising the bar on wages and quality of life and offering workforce training.

In line with the BTI's reputation as one of the United States' top technology incubators, it has set itself a high hurdle for 1999-2003. During that five-year period of time, its goal is to accept 25 new clients, graduate 35 companies, and create a total of more than 8,000 jobs that pay, on average, \$40,000 to \$60,000 per year. It also projects a total economic development impact of \$1.7 billion, generated through \$269 million in incubator client expenditures, \$137 million in bank deposits; \$243 million in residential real estate investments, \$365 million in commercial real estate investments, \$675 million in employee expenditures and \$17 million in local government revenues. During the same period of time BTI projects program investments of \$2.5 million.

(Sources: Adapted from numerous sources including Gibson, Andrea, "No Substitute for Good Advice – At Boulder Technology Incubator, Custom-Made Teams Are Key," *NBIA Review*, vol. 15, no. 1 (February 1999), pp. 6-9, 16; a telephone conversation with BTI Executive Director Jerry Donahue, June 2000; and *the BTI Website*, [www.bouldertechincubator.org](http://www.bouldertechincubator.org).)



**RENSELAER POLYTECHNIC INSTITUTE (RPI) INCUBATOR PROGRAM,  
TROY, NEW YORK, MANAGED BY BELA MUSITS**

It is unlikely that any U.S. incubator has had sustained success and recognition comparable to the Incubator Program located at Rensselaer Polytechnic Institute in Troy, New York. The reasons for this are transparent: a clear purpose and able management sustained over a period of 20 years. Further, as one of the nation's leading engineering schools, Rensselaer, with its interest in applied technology, has probably suffered less from the cultural issues that are faced by research universities that specialize in basic research.

The push to engage in technology commercialization and new company formation on campus can be traced to former RPI President George M. Low. Low's vision of higher education included a solid belief in the need for partnerships between education, industry and government. Low directed the Apollo Lunar Landing before joining Rensselaer and was convinced that the university should play a role in economic development. He had been quoted saying that, to receive a well-rounded education, Rensselaer students must be exposed to "the laboratory of an entrepreneurial company."

The incubator's first manager was Michael Wacholder, who has, for the past 15 or so years, managed Rensselaer's Research Park and hired subsequent incubator managers, bringing a parade of dynamic and entrepreneurial individuals into this position and to industry leadership. Thus Wacholder became a critical individual who sustained Low's vision. He notes: "The whole concept [behind the incubator] was to transfer the technology of the university to the marketplace, and the incubator was the perfect mechanism for such a transfer."

Another key to Rensselaer's success is that, as a private engineering institution, the university took an entrepreneurial view of the incubation program from the beginning. The operation was lean and mean – with a small staff – and while the institution provided the initial incubator building, all renovations were paid for by incubator operations. The incubator never had access to the largess offered state institutions and thus operated independently and in a business-like fashion.

Of all U.S. incubators, Rensselaer probably boasts one of the largest percentages of companies derived from student and faculty projects. University faculty, staff, students and graduates founded more than two-thirds of the 140 in-house clients and numerous affiliates served over 20 years. Eighty percent of these clients are still in business. They provide \$150 million in revenue to the regional economy and more than 1,500 jobs including hundreds filled by Rensselaer graduates. Currently, the incubator has 28 clients who generate \$14 million in annual revenue.

Beginning with about 10,000 square feet converted to incubator use, Rensselaer now manages over 125,000 square feet of incubator and post incubator space, as well as a 1,250-acre research park. Some 50 companies occupy space in the 870,000 square feet of the Rensselaer Technology Park. Ninety percent of these companies are involved with the university. Rensselaer faculty, alumni or students founded some of them; others license Rensselaer technology or employ students and graduates. Overall, these firms employ more than 2,300 people, and company payrolls total approximately \$70 million. In addition to job creation, the companies contribute to

local economic development in the form of taxes – over \$1.7 million in school and property taxes enters local coffers annually.

Successful incubator graduates include MapInfo, a leader in desktop mapping software, with sales approaching \$100 million annually; LearnLinc, a distance learning software developer; and Albany Molecular Research, a pharmaceutical developer/manufacturer. In 1999, incubator company GlobalSpec.com, a business-to-business engineering specifications service, obtained \$20 million in first-round venture financing, placing this firm among the largest recipients of venture capital that year in upstate New York. They are now located in the RPI Technology Park.

Over the years, Rensselaer created numerous programs both on campus and in the community to ensure that the university and its incubator remained at the hub of the region's economic development and technology commercialization initiatives. These include a network of "venture affiliates," people who are involved in new company creation (regional entrepreneurs who meet for networking purposes); a Capital Region Technology Development Council, a support network made up of business leaders that also serves entrepreneurs; and the Severino Center for Technological Entrepreneurship. Located within the Lally School of Management on campus, the Severino Center is responsible for internships and work-study programs and offers entrepreneurship education to both business and engineering students. By the late 1990s, these entities were working in concert as the Rensselaer Technological Entrepreneurial Council (RenTEC) with the express purpose of moving university technology into the marketplace.

"We took our tech park, our incubator, our Office of Technology Commercialization (the university's licensing office), and our Center for Technological Entrepreneurship and established a council to focus on technology commercialization," says Wacholder. "We began to see that once we did that, we could generate deal flow." During the university's 174<sup>th</sup> year in 1998, it did more deals than during its first 173 years altogether, according to Wacholder.

No incubator in the United States is so highly integrated within its community and university as the Rensselaer Polytechnic Institute Incubator Program. The university's technology licensing office is located within the incubator itself, so any professor who wishes to license a technology must visit the incubator. The university's fundraising arm has found that many of its alumni wish to support entrepreneurship activities, and they actively seek such donations. An alumnus, Paul Severino, recently gave \$5 million to support the Lally School's Center for Technological Entrepreneurship. The student recruitment office utilizes Rensselaer's entrepreneurship activities to recruit students whose professed goal is to start their own companies. And the student placement office actively places students and graduates in the entrepreneurial companies in the incubator and elsewhere in the region. Additionally, RPI runs one of the premier entrepreneurial student internship programs in the United States, which provides students opportunities to gain university credit – and get paid – while working closely with company founders.

“We know how to start them. We know how to keep them alive, and now the challenge is to make the companies thrive...to concentrate on success that is the next level of incubation,” says Bela Musits, RPI incubator director. Certainly, Rensselaer is on the right track, as evidenced by the rapid and impressive growth of its newest star company GlobalSpec.com.

Finally, Musits points to a new idea that he has hatched at RPI. The incubator manager plans to raise \$100,000 for an “RPIdea Lab” targeted to students who have started a business or are thinking about starting a business – those who are not quite ready to become incubator clients but who have outgrown working on their company in their dorm room. Musits has set aside 600 square feet for common use. The room will include a business library, cubicles, couches, conference tables and soft drink and snack machines. He plans to hire a full-time person to run the RPIdea Lab, and participants will have access to Musits and other top staff of the incubator. They will be invited to a monthly dinner with a speaker focused on a relevant topic once a month, and their dinners will be provided. The Idea Lab will also be home turf for RPI’s Entrepreneur’s Club. The benefit to students, says Musits, is, “they will have a place to work on their business ideas, convert that idea into a plan, start their business and have full access to all of the incubator facilities and resources without having to lease space.”

(Adapted from sources including telephone conversations with Bela Musits, RPI Incubator Program Director, June 2000, and Michael Wacholder, May 2000, an article, “Incubating at Universities: Bridging the Culture Gap,” published in the Vol. 16, No. 3 issue (June 2000) of *NBIA Review*. This article was adapted, in turn, from the forthcoming book *Technology Commercialization through New Company Formation: Why U.S. Universities are Incubating Companies*, by Nanette Kalis, NBIA Publications, Athens, Ohio, June 2000.)

### *The Power of Networks at Rensselaer*

Rensselaer Polytechnic Institute’s ability to bring in high-powered alumni and university faculty and staff to provide mentors, company board members and even management is best exemplified by incubator affiliate MapInfo. MapInfo is the world’s leading supplier of desktop mapping software and solutions. Desktop mapping was born in 1986 out of the collective insights of four RPI students. The original idea was conceived by Sean O’Sullivan in 1984 and was the subject of his research project in RPI’s Center for Interactive Computer Graphics. In 1985, O’Sullivan led a team of students who developed MapInfo’s first business plan as part of RPI’s *Principles of Entrepreneurship* class. He and three other cofounders formed the company in early 1986 and shortly thereafter recruited Michael Marvin, an RPI research center manager with an entrepreneurial bent, to be an initial investor, advisor and ultimately CEO. RPI Trustee Warren Bruggeman, a retired General Electric vice president, volunteered his time to MapInfo as one of the company’s early directors and mentors. MapInfo hired dozens of graduates, and received additional counseling and networking support via affiliation as an incubator company. MapInfo proved to be particularly adept at accessing RPI’s networking of high-powered alumni in the computer hardware and software industry who were in senior positions with potential customers. During this time MapInfo also gained from the interest and involvement of RPI President Roland Schmitt, an internationally renowned technology manager and policy maker. Schmitt was the latest in a series of RPI presidents who embraced the incubator program, founded under then-President George Lowe in 1980. While many of the particular mentors developed for MapInfo were unique to that firm, the company’s experience is illustrative of the policy of the incubator to “wrap the right people around the company,” according to current Research Park manager and founding incubator director Michael Wacholder. As the result of this policy, the incubator has grown to be a significant player, well recognized among both regional and university networks.



**St. John's Innovation Centre, Cambridge, England, managed by Walter Herriot, O.B.E.**

The St. John's Innovation Centre is located in the Innovation Park developed by St. John's College on land it has owned since 1534, directly opposite the Cambridge Science Park north of the ancient university city. The physical incubator did not initiate the growth of high-technology ventures in Cambridge. In fact, it was a direct outgrowth of an ambitious program known as the Cambridge high-tech cluster, whose seeds were sown in 1978. In that year Barclays Bank identified 25 knowledge-based (high technology) businesses in the area and decided that they should put effort into developing the growth potential of these firms as well as encouraging the spin out of similar businesses from Cambridge University. They had identified research and development as potential drivers of economic growth.

Twenty years ago Cambridge was a city with a population of 100,000 and an immature business infrastructure. The 25 knowledge-based businesses employed about 2,000 people, but the university was world-class and, Barclays reasoned, had the power to seed further growth. The concept grew out of the academic work of Alfred Marshall and Joseph Schumpeter. Marshall identified how clusters of firms derive strength from working with one another, most importantly encouraging innovation. Schumpeter, in the early 20<sup>th</sup> century, identified entrepreneurs as creators of new products and services, new methods of production, new markets and new forms of organization.

Barclays provided the new firms with business advice, which included business plan assistance, cash flow forecasting and assistance in identifying appropriate financing sources. A club was formed and key speakers invited in order to encourage firms to network among themselves and help improve the business knowledge of the companies. In addition, Barclays identified certain individuals who it thought capable of running substantial businesses. They made every effort to get to know these people on a personal basis, offering advice and guidance as they encountered problems growing their firms.

While Barclays is credited for initiating the high-tech cluster, the Cambridge Consultants, a technical consulting firm, is given special credit for advising firms and helping to create many successful spin-offs from the base of existing technology companies. They provided direct assistance to high potential firms when they ran into significant problems and spun out businesses such as Domino PLC, Prelude and a venture capital fund. They also spun out other business-consulting firms, which in turn helped create additional high quality businesses.

As a virtual incubator Barclay's high-tech cluster has been a clear success, and Cambridge has been identified by *Newsweek* as one of the seven cities in the world that could rival Silicon Valley over the next 20 years. Today, there are over 1,500 high tech companies in bioscience, information technology, e-commerce and software. These firms employ about 35,000 to 40,000 and generate annual sales of £3 to 4 billion. About 250 new businesses are being formed every year in the high tech sector. The businesses in the Cambridge cluster have also exemplified Schumpeter's technology push mode of innovation, since these firms have created their own markets, exporting the bulk of their production from the region.

By 1984, Barclays felt that it had achieved what it wanted and it was now time to let others take the leadership role. This led to the development in 1987 of St. John's Innovation Centre. Those responsible determined that the provision of buildings alone would be inadequate, however, and that it would be necessary to create an environment of mutual encouragement and support, as well as a sympathetic network of advisors. The advisors would not only provide active assistance but also promote interaction between university teaching and faculty research. Then in 1990 Walter

Herriot, who had been responsible for the Barclays policy, was appointed director of the Centre. Herriot was asked to provide management on site at the incubator so that the companies could benefit from easily available practical advice on a variety of business issues. Herriot was recently awarded a coveted O.B.E. (Order of the British Empire) presented by Queen Elizabeth in recognition of his success.

Centre tenants usually fall into the following categories:

- Startup companies researching and developing products
- Young technology-based firms of one to five year's standing that have the potential to produce further spin-off companies
- Service companies with a technology orientation, which can provide support such as training, marketing and public relations expertise

Tenants are working on neural networks, workflow management software, multimedia, fixed and mobile telecommunications, cryotechnology, biomedical imaging, lasers, chromatography, data communications, instrumentation, films and biotechnology.

St. John's College exercises control over the type of tenants accepted, and the park has been successful both commercially and in implementing the philosophy that underpins it. The demand for space has been a constant problem for the Innovation Park and the Innovation Centre. A second phase, Dirac House, was completed in July 1989 and a third phase, the Jeffrey's Building, was completed in February 1990. An extension to the Innovation Centre including restaurant and conference facilities opened in 1994. Currently, the Park has a total net usable space of approximately 125,000 sq. ft., with 85,000 set aside for developing businesses. The Centre houses approximately 50 companies employing over 1,000 people. These firms have annual sales in excess of £40 million per annum. Over the past five-year period, the survival rate for companies has stood at more than 88 percent, compared to about 50 percent for other, similar businesses in the Cambridge area, and 45 percent for businesses generally in the United Kingdom. Over 100 firms have graduated from the Centre.

Innovation Centre clients have easy in and easy out leases, meaning that the companies have three years security of tenure but need only give one month's notice to vacate. According to St. John's Website, this is very rare in England. The incubator also provides free networking advice to tenants and makes recommendations on sources of university assistance, product innovation, design and manufacture, human resource management, the availability of financing, marketing and public relations and training and development. On a paying basis it can provide some company administration, accounting and corporate secretary services required by statute.

The Centre also assists some 400 embryonic businesses that are not tenants on site and currently has eight full-time professional staff providing business assistance. If they receive a request for specialized technical assistance, they draw from a considerable pool of talent in the Cambridge area. There are two seed funds on site, although these are managed independently. The Centre is convinced that their clients value its independence from all venture capital funds. The Innovation Centre has helped to facilitate a network of angel investors and has extensive contacts with all of the Cambridge and London venture capital funds that are interested in knowledge-based business.

The Innovation Centre also is working with others in the region to establish a regional innovation and technology transfer strategy. By developing collaborative relationships with other innovation centers, they hope to serve as catalysts to spread the effect of the Cambridge Phenomenon to the wider sub-region. Since 1998, the Centre has been developing stronger relationships with the Cambridge University, in particular working with the university's Industrial Liaison Officer to

create more small- and medium-sized spinouts. They have identified and are assisting some 50 potential businesses. The Centre works with the Judge Institute of Management Studies (Cambridge University's business school) to provide reference material for research and is currently assisting it in establishing the Cambridge Entrepreneurship Centre. Innovation Centre staff helped write the business plan for the Entrepreneurship Centre in 1999 and even managed the Entrepreneurship Centre pending appointment of a full-time director. An international conference designed to assist the growth of small- and medium-sized spinoffs is now held annually in conjunction with the Judge Institute.

It is interesting to note that the growth of the high-tech cluster – of which the Innovation Centre has become a vital part – has been a bottom up initiative. It developed almost entirely without direct government support and with no central planning. Also, at the time the cluster was created, the university was not generally supportive of spinout businesses. New businesses came mainly from existing firms rather than the university.

The cluster continues to be informal but there are a number of other initiatives, such as Enterprise Link and the Cambridge Network, that are formal strands. They have created links with Oxford University and have worked with the European Union in conjunction with the Regional Development Agency to learn best practices from cities such as Stuttgart, Stockholm and Madrid. In the last 12 months the U.K. government has been more active in trying to encourage entrepreneurship through funding the Cambridge Entrepreneurship Centre, the seed fund at Cambridge University and outreach activities. These are all new initiatives that had their genesis in the high-tech cluster and the St. John's Innovation Centre.

(Sources: St. Johns Innovation Centre Website, [www.stjohns.co.uk](http://www.stjohns.co.uk), and conversation with Walter Herriot, Managing Director, June 2000.)

**idealab!** Pasadena, California (headquarters); Sunnyvale, California; New York, New York; Boston, Massachusetts, and London, founded by Bill Gross

idealab! (<http://www.idealab.com/>) is a privately operated and funded incubator/accelerator for creating, launching and operating Internet businesses. The company is the brainchild of its founder, Bill Gross, who needed a venue for transforming his ideas into viable business ventures following the sale of his previous venture, Knowledge Adventure, to Cendant for \$100 million. idealab! was founded in March of 1996 and currently has 50 businesses in various stages of development. The company has backed seven public companies and recently (March 2000) secured \$1 billion in equity financing to continue to start and grow Internet businesses, acquire strategic assets to support its existing network of companies, increase its ownership position in some of its current companies, and expand into new domestic and international markets. The company has recently filed a registration statement with the Securities and Exchange Commission for a proposed initial public offering. Notable members of the idealab! portfolio include GoTo.com, eToys, CitySearch, NetZero, and Tickets.com, which have a total market capitalization of greater than \$10 billion.

To understand the idealab! model, one only need look to the company's mission statement, which clearly articulates its objectives.

*idealab!'s mission is to develop individual ideas into highly focused and successful Internet businesses. idealab! leaders believe that to succeed in the dynamic Internet market, companies must achieve a rapid speed of execution by tapping the services, support and knowledge of individuals and organizations that have extensive experience in starting Internet companies. idealab! combines the best elements of a small and nimble company with the financial strength and wisdom of a much larger organization — sharing these benefits with its operating companies. Each business in our integrated, collaborative network of companies uses the Internet to satisfy an unmet market need.*

idealab!'s approach to business incubation is somewhat unique in that most of the business concepts originate with Gross, although some come from friends, family and the four other idealab! partners. The partners meet twice a month to analyze the good and bad aspects of a new idea, and if it is determined to be worthy of experimentation, it is moved into the incubation process. CEOs are hired to run the companies, which are housed in idealab!'s 24,000 sq. ft. facility in historic Pasadena. The incubator build out is simple with open-plan workspace built around a central area that houses Gross's office. Furnishings follow the same simple theme with desks made of plywood doors separated by taxicab yellow partitions. New ideas enter the facility in a space called the Hot Spot, which consists of a cluster of desks sitting in front of Gross' office. If the company survives this phase of the process, it moves into new and larger spaces within the facility. Once the company is larger and stable, it moves out of the facility into a separate building

that may or may not be in close proximity to the incubator (e.g., eToys moved its operations 22 miles away to Santa Monica).

During the incubation phase idealab! invests no more than \$250,000 in exchange for an undisclosed percentage of stock in the new venture. With its new rounds of capital as the company grows, this stake may be increased. The goal of idealab! is for its companies to graduate from the program in six months and ultimately have an IPO or be acquired.

In addition to providing office space, idealab! actively participates in the ongoing operations of its network companies through board representation, information sharing and facilitating collaboration among the companies. idealab! also recruits management to oversee day-to-day operations and to concentrate on the rapid execution of the business plan. Additionally, idealab! provides each operating company strategic guidance as well as assistance in graphic design, competitive research, sales, marketing and brand management, recruiting, Web development and information technology, and legal, finance, accounting and human resources.

idealab! founder Gross also utilizes an innovative approach to testing some of his new ideas. He “bolsters conventional market research by prototyping each idea as if it were an actual business – for a day, or even a few hours. Sometimes he’ll set up a site that appears to be stocked with inventory, although it actually has none. He accepts orders via credit card, though there’s no merchant account.... They throw away the credit card numbers and buy the product at a local store and ship it to the people, sometimes for free.” (Source: *Wired*, September 1999).

(Source: Multiple sources including idealab! web-site at <http://www.idealab.com>; a reprint from *Wired*, September 1999; a reprint from *USA Today*’s “Money” section, Tuesday, June 8, 1999.)

