



Research Article

## Enterprise Development through incubation management

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### Abstract

This paper examines incubation management as a veritable growth stimulus vitally needed by the emerging economies with emphasis on the business and technology incubators. It discusses the need for management incubation, incubation models, the goals of business incubation, best practices for incubation processes, students' participation in the activities of the business incubator, characteristics of its managerial structure among others. The term 'Incubation', with its etymological roots in the Latin word *incubatio*, which referred to a practice by the ancient Romans of carrying rudimentary ideas with them for developing them into visionary dreams over a period of time. Incubators shared business services and equipment, technology support services, and assistance in obtaining financing necessary for company growth. It is recognized as a way of meeting a variety of economic and socio-economic policy needs which can include: Employment and wealth creation, support for small firms with high growth potential Transfer of technology Promoting innovation Enhancing links between universities, research institutions and the business community Industry cluster development and assessment of a company's risk profile Business incubators accelerate the successful development of entrepreneurial companies through an array of business support resources and services. Its main goal is to produce successful firms that 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. Technology Incubators bring about the development of technology-based firms. These are mainly located at or near universities / polytechnics and science and technology parks. Given the multitude of challenges being faced by entrepreneurs in emerging economies, there is a strong case for fostering incubation systems. The mentoring and business assistance provided by incubators are especially useful to individuals who are not part of business communities and/or do not enjoy support from families. Established businesses and promotional organizations associated with incubators would provide the latter's clients with the much needed know-how available in such networks.

**Keywords:** Economic growth, Entrepreneurship, Business start – ups, Incubation management, Technology transfer and Job creation

### INTRODUCTION

The incubator concept and the term Incubator have been around since at least 1959 when Batavia Industrial Centre in Batavia, New York was opened (McKee, 1992, p41). Business incubation pioneers like Joe Mancuso, June Lavelle, Robert Meeder, Jim Grewood, Mark Rice, Jonathan Gorhane (all in USA) with the others untiringly promoted business incubation ideas. One of the most interesting examples of business incubators is located in Silicon Valley, USA, and called International Business Incubator or Business Embassy.

The term 'Incubation', with its etymological roots in the Latin word *incubatio*, which referred to a practice by the

ancient Romans of carrying rudimentary ideas with them for developing them into visionary dreams over a period of time, is today used in the field of medicine to refer to the special facility where prematurely born babies are nurtured under controlled conditions.

Business incubation formally began in the US in the 1960s, and later developed in the UK and Europe through various related forms (eg. Innovation centres, technopoles/science parks).

One of the mechanisms employed to nurture small firms for more than two decades is “business incubation”. Incubators provide qualifying new start-up businesses with a set of facilities -- physical space, shared services, business and legal advice, and financial inputs – to facilitate their creation and assist them until “graduation”, when they have the capacity to “survive” in the outside competitive environment.

A business incubator is an organization that supports the creation and growth of new businesses by providing subsidized office space, shared administrative services, access to capital and financing, networking opportunities, and assistance with legal, technology transfer, and export procedures (Allen and Weinberg, 1988; Erlewine and Gerl, 2004; Hackett and Dilts, 2004).

It is also defined as an organisation which offers a range of business development services and access to small space on flexible terms, to meet the needs of new firms. The package of services offered by a business incubator is designed to enhance the success and growth rates of new enterprises thus maximising their impact on economic development.

According to the National Business Incubators Association (NBIA), “Business incubation catalyzes the process of starting and growing companies, providing entrepreneurs with the expertise, networks and tools they need to make their ventures successful. Incubation programs diversify economies, commercialize technologies, create jobs and build wealth.

Business incubators are the organizations created to help small and young firms become stable and profitable. They are a mainstay of economic development programs. They 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 free standing.

A business incubator’s main goal is to produce successful firms that 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.

Critical to the definition of an incubator is the provision of business assistance that comes in the form of management guidance, technical assistance, and consulting tailored to young, growing companies. Incubators may also involve facilities and facility-based services that provide clients with appropriate rental space and flexible leases, shared business services and equipment, technology support services, and assistance in obtaining financing necessary for company growth.

It is recognized as a way of meeting a variety of economic and socio-economic policy needs which can include:

- Employment and wealth creation
- Support for small firms with high growth potential
- Transfer of technology
- Promoting innovation
- Enhancing links between universities, research institutions and the business community
- Industry cluster development
- Assessment of a company’s risk profile

In general, an incubator is a physical location that provides a defined set of services to individuals or small companies. This may include specific types of office space, flexible lease terms, access to technology, financing, and technical assistance (such as marketing, legal, finance, HR, and other business development services). By locating similar or complementary entities in proximity to each other, the incubator may also play a critical role in promoting knowledge transfer, both formally and informally.

### **Dimensions of business incubators**

Business incubators embody a systematic approach to new enterprise development which can be described as consisting of five dimensions:

- Enterprise development;
- A business consultancy network;
- Entrepreneurial synergy;

Flexible affordable working space; and  
Shared office services (Small Business Council, 1988, pp. 13, 14)  
These five dimensions describe the purpose, benefit, design and management of business incubators.

### **The features of business incubators**

Incubators are generally characterized by some relevant features, which generally include:

A managed work space providing shared facilities, advisory, training and financial services, and a nurturing environment for tenant companies;

A small management team with core competencies;

Selection of start-up companies entering the incubator, 20 to 25 in the average, to be graduated generally after 3 years.

Incubator models may vary according to:

Their mandate (for-profit or not-for-profit)

The type of sponsorship they have (public – private – mixed)

Their focus (mixed-use – niche). The most frequent types of niche incubators are related to technology (technology incubators) and bio-technology (bioincubators).

### **The need for business incubation**

Small and Medium sized businesses across Africa face many and varied challenges to their growth and operations. Incubation projects are designed to address the following challenges;

#### **Appropriate office space**

**Poor electrical and water:** SMEs need first and foremost an appropriate infrastructure in a building. This consists of dependable and redundant power supply, appropriate electrical installation, power conditioning for sensitive equipment, and water. This is rarely available in the cheaper office rentals that most start-ups and small enterprises can afford.

**Expensive Internet:** ICT SMEs need good and low cost connectivity to the internet backbone; preferably a fibre optic connection that has less interference or latency than a wireless/satellite link. Most SMEs need to arrange their own wireless or DSL data links which prove to be less reliable and more expensive than if they could pool resources and demand and push for wholesale pricing on bulk connectivity options.

**Inflexible lease terms:** leases can often be paid as much as three years in advance and do not provide flexibility in terms of changing the terms of the lease, or expanding or contracting into additional space as the company grows or contracts.

**Individual Resources:** companies generally have to provide their own resources, like generators, receptionists, security, kitchens, water tanks, internet connections as they cannot rely on other building tenants for maintaining shared resources. An ICT SME is going to be much more vulnerable to downtime than other SMEs – it's like a factory, no power, no income. ICT service industries supporting global customers need a 99% uptime. Building your own infrastructure and environment in an older building is expensive to setup and expensive to maintain.

**Unattractive locations:** SMEs will often locate in the cheapest real estate available and this can project a negative image to potential customers – often taking a garage or floor of a house, or locating in a crowded market area. Image is important for an aspiring SME trying to establish its credibility, especially one that has just a few employees and is seeking to get service contracts from larger corporations.

## **INCUBATION MODELS**

### **First generation incubators**

Generally characterized by a strong 'real estate' component and proximity to research institutes or technical university environments, this type of incubator is generally created by building new facilities, such as science, technology parks, or technopoles, or by readapting abandoned buildings (e.g. industrial complexes). Its real estate component often implies

considerable public investments, sometimes supported by national or local programs for innovation, job creation and economic development. Sustainability is considered a major challenge of these initiatives, which always require considerable fixed investments, have long development life-cycles and can suffer from inadequate financing and exit mechanisms for graduating companies. The most frequent “success factors” of these systems are tied to their capacity to focus on new venture creation rather than on real estate management, governance with an entrepreneurial management, and a strategic marketing orientation.

### **University/Polytechnic incubators**

University incubators are established in or by university/polytechnic campuses. There are different models, sizes and nuances regarding these kinds of initiatives. The common factor is that these incubators generally promote the development of new research/technology-based firms inside their own facilities. The role played by universities/polytechnics consists of linking research, technology, capital and know-how to leverage entrepreneurial talent, accelerate the development of new technology-based firms, and speed up the commercialization of technology<sup>11</sup>. Their success is considerably tied to the capacity of linking research with industry.

### **Virtual incubators**

Virtual incubators are considered the “second generation” of incubators. These incubators are non-property-based ventures which require lower fixed investments and are regarded as a possible way of servicing SMEs in areas with insufficient critical mass. Virtual incubators are often hosted by a university or a research center, and are characterized by their capacity to operate both within walls and outside. When they operate as “incubators without walls” they serve newly created firms without hosting them within the incubator’s facilities. They usually generate externalities among firms linked via computer and telecommunications networks. Most virtual incubators are technology oriented, and are aimed at transforming research into marketable products. The offering of pre- incubation and post- incubation services are considered a natural evolution of this model. Examples of incubators without walls exist in several countries, including in Brazil, Russia and Australia.

### **International enterprise centers – international business incubators**

This model is considered the “third generation” of incubators. These incubators provide a full range of support services for the development of knowledge-based businesses.

Most of them are export-oriented and show impressive growth rates and sales records. They link universities, research institutes, venture capital and international joint ventures.

This incubation model – based on the convergence of support mechanisms – is already present in China, Korea, and Malaysia. Some of these incubators are beginning to create *Incubator Networks*, incubators within the same region or country, or with the same focus. Their strength is based on their capacity to share knowledge and resources, and on the linkages and synergies that can be created in a research and development framework.

There are currently eight incubator networks in China.

### **DOT.COM INCUBATORS**

Dot.com incubators present a ‘model’ with specific features. Created under the ‘wave’ of the new economy, dot-com incubators or Internet business accelerators are a relatively recent but well-known phenomenon in developed markets, the U.S. in particular.

They are characterized by strong venture capital orientation and shorter incubation periods (a Few months instead of 2-3 years). A few dot.com incubators started to appear in emerging and fast-growing markets around 1999<sup>12</sup>. Some consider these incubators as the ‘fourth generation’ of incubators. Characterized by higher levels of risk and mortality rates, the development potential of these incubators has not been sufficiently assessed so far, especially in developing countries.

### **Incubators could also be classified based on the following typologies**

A popular classification specifies that about 54 % of incubators are of the ‘mixed- use’ type, even though the current trend is to have specialized incubators that cater to *technology* (39%), *services* (4%), *manufacturing* (3%) and *speciality* (3%) (NBIA, 2009).

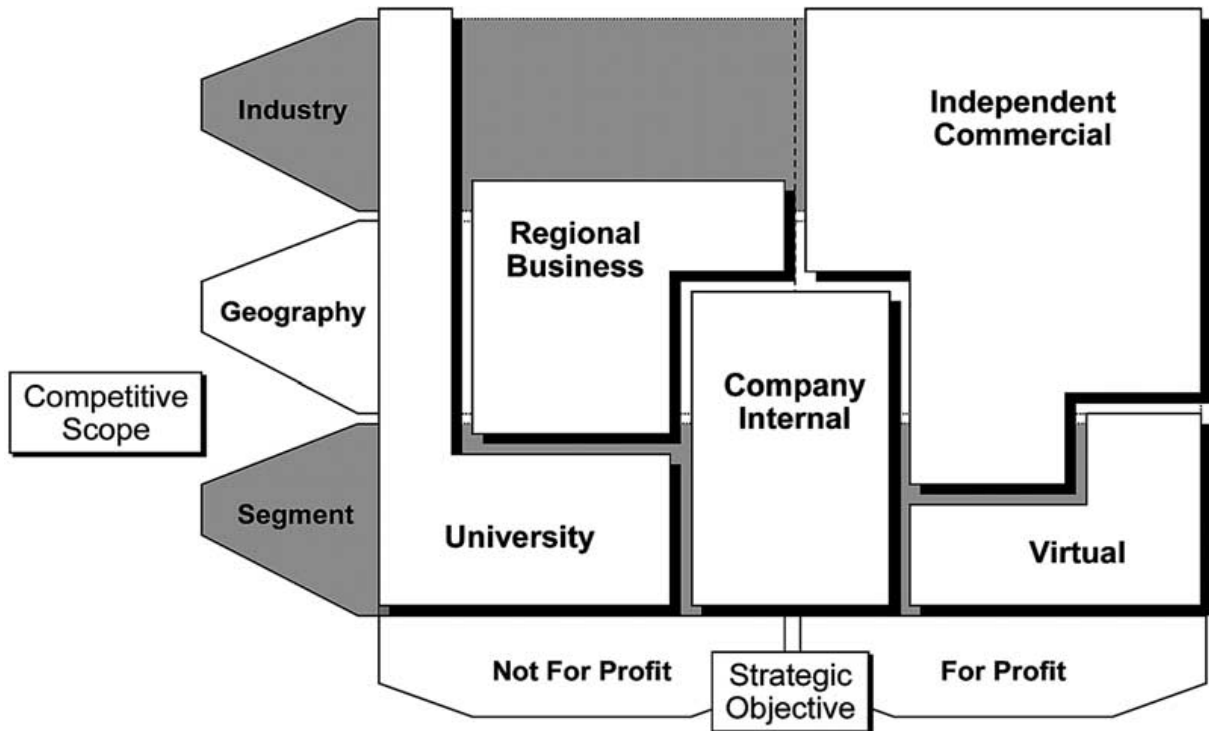
Obviously the concern for developing technology-based ventures is evident, which is suggestive of the special needs

and risks associated with technology-based ventures, and thereby highlight the rationale for having incubator service for such industries rather than for others.

Irrespective of their specialization, incubators have also been classified as 'for-profit' and 'not-for-profit'.

The not-for-profit incubators seek to commercialize research or foster economic growth and thereby employment opportunities through the creation of new ventures. The for-profits generally function as business accelerators, seeking to speed up product development and enterprise growth and thereby enhance the equity and profits of shareholders including their own (Mourdoukoutas and Papadimitriou, 2002).

About 94% of North American business incubators are not-for-profit organizations focused on economic development, while the remaining 6% (for-profit incubators) aim for enhancing the returns on shareholders' investments through faster growth and development of the enterprises concerned.



**Figure 1.** Types of incubators based on competitive scope and strategic objective  
**Source:** Carayannis and von Zedtwitz, 2005.

**Table-1: Typology of business incubators**

	Main philosophy: dealing with	Main Objective	Secondary	Sectors involved
Mixed incubators	Business gap	Create start-ups	Employment creation	All sectors
Economic development incubators	Regional or local disparity gap	Regional development	Business creation	All sectors
Technology incubators	Entrepreneurial gap	Create entrepreneurship	stimulate innovation, technology Start-ups and graduates	Focus on technology, recently targeted, e.g. IT, speech-, biotechnology
Social incubators	Social gap	Integration of social categories	Employment creation	Non profit sector
Basic research incubators	Discovery gap	Bleu-Sky research	Spin-offs	High tech

**Source:** Aernoudt, 2004

## **The goals of business incubation**

Incubation programs may also have a wide range of goals, including:  
Economic development and generation of new jobs  
Marketing of research investments  
Property venture/real estate development  
Creation of entrepreneurship in transition economies  
Opportunities for national immigrants and nationals graduating abroad  
Development of export production

## **Definition of the goals of the incubator**

Goals should be realistic and consistent with the market environment, as well as with the resources available in the country.

The incubator should be able to offer its clients, on the long term and on a self-sustained basis, valuable resources at affordable cost.

The positioning, model and focus of the incubator should take into account the main market opportunities that can be seized, and the comparative advantages that can be achieved.

The main market and financial constraints should be clearly identified and addressed.

## **Success factors of the incubators**

It is clear that the critical success factors for these incubators include:

Volume of companies co-located is important as it leads to natural clustering and collaboration.

Entrepreneurs will learn more from each other, and other businesses, than 'consultants.'

Combining start-ups with mature companies in same building encourages collaboration.

Diversified models (incubation + office rentals) keep programs sustainable and independent.

Not being 100% publicly funded keeps incubator focused on tenants and services provided.

Strict entry criteria (focused on innovation and implementation) can ensure high success rates.

Investors/entrepreneurs seeking to make new equity investments can be leveraged as mentors.

Businesses seeking future clients can provide discounted professional services.

A strong manager who monitors both mentors and companies is key.

Use managers who have entrepreneurial experience and can 'relate'.

Incubation programs can remain lean and cost effective with few employees (2)

Ensuring tenants pay for services screens out those that are not somewhat commercialized

Incubators create a climate of collaboration and networking from the start

## **FIVE "MUST DO" FOR BUSINESS INCUBATOR SUCCESS**

1. A successful incubator must be grounded in the real world of business and have deep support from the local business community.
2. Incubator developers need to take a holistic view of incubators' role in entrepreneurial development – they are not, in and of themselves, magic bullets.
3. The community, academic or other sponsors of the incubator must hire management with the expertise to help companies grow and to run the incubator in a businesslike fashion. This includes providing adequate compensation for experienced management.
4. There must be a clear understanding of the existing entrepreneurial market that the incubator will focus on.
5. The incubator's sponsors and management should agree on the program's mission and determine specific criteria for measuring its success.

## **Organization and governance of business incubators**

The incubator's legal structure will be influenced by its mission (for profit, non- for-profit) as well as by the financial model selected to sustain its operation. The incubator should create a board to govern its activities.

Consensus among staff and major stakeholders on the mission of the incubator should be achieved.

The incubator management team should be composed of a Director, and a few full time staff – their number depending on the size, clients and activities managed by the incubator.

The recruitment of a good team is key to the incubator success. The Director should be a very dynamic person with business experience, preferably in a small company. She/he should also be able to attract sponsors, investors, financial stakeholders and clients. Certain staff should be designated to work directly with client services.

The incubator should be able to attract the highest number of qualified professionals, including volunteers and interns, to support specific activities of the incubator and of clients at no cost or at very low prices.

### **Sustainability**

The achievement of incubator sustainability is one of the main challenges the incubator management has to face. Managers ability is also measured in terms of their capacity to raise funds, human capital and other resources that can be used to run the incubator and better serve its clients.

Generally, rental and provision of space are not sufficient to cover all the costs of the incubator. In many incubators, especially in developing countries, sustainability is an issue.

Considerable sources of revenue may come from incubator's equity participations in client companies and subsequent IPOs, or through the payment of royalties to the incubator for a certain number of years when a new product by an incubatee company is commercialized. This model is particularly widespread among technology incubators in industrialized countries, especially in the USA and in Israel.

Agreements with universities and national R&D programs can provide public funding or in-kind support to incubators.

Public support, as well as international donor support (in the case of developing countries), may be required, especially during the first years of life of an incubator, or under particular circumstances. Long-term sustainability should however be one of the main goals of any incubators and the structure of costs and revenue be accurately planned during the design phase.

### **Best practices for incubation processes**

The incubation process is composed of three main steps, consisting of the entrance of the entrepreneur in the incubator; the development of the company's product and organization; and the 'graduation' of the company from the incubator, as soon as it is ready to compete and grow in the open market.

The process is complex, and the incubator's success depends on its capacity to successfully implement it.

Best practices have been identified for each of those steps.

### **Key issues:**

#### **Admission criteria and procedure for selecting incubatees**

Admission criteria should be clearly set, and guidelines and transparent evaluation procedures applied. The screening activity should be conducted by using standard procedures and forms, and managed by a team of professional evaluators. Evaluators generally include the incubator manager and some members of the team, consultants, interns, academics, etc.

The selection should be conducted in an ongoing effort to identify applicants' needs, while determining whether the services offered by the incubator can have a 'value' to the applicant.

The screening process should be conducted according to criteria which are fully consistent with the goals of the incubator.

Screening criteria generally include issues such as the innovativeness of the business/product idea; product feasibility and patent protectability, understanding of market and growth potential, financial plan, risks/opportunities involved in the project, professional and education background of the applicant, community benefits, ecological awareness, etc.

The screening should be conducted taking into account the potential synergies among clients. The incubator should also avoid incubating companies directly competing in the same market/product, in order to avoid potential conflict situations.

### **Incubation process**

Once admitted in the incubator, companies should be offered a 'nurturing' environment and a set of services adding 'value' to their stay in the incubator.

Services include:

### **Facilities**

Offer of modular and inexpensive space and facilities. Optimize use of common space to foster informal networking among companies.

### **Professional services**

Offer of professional advice, counseling and mentoring at no or very reasonable cost. Some incubators, especially in the U.S., offer qualified resources to join the client's board of directors, until a 'formal' one is created by the company after graduation.

### **Networking opportunities**

Organization of seminars, forums, and events facilitating contacts and networking among companies located both inside and outside the incubator.

### **Access to capital**

This is often perceived as one of the most valuable services provided by incubators. Equity capital generally comes from venture capitalists, business 'angels', corporate investors, or public funding programs. Some incubators offer venture capital funds specifically established to fund the incubator's clients. Debt capital is generally provided by lending institutions or community lending programs for economic development. Some incubators offer their clients in-house lending and/or equity investment programs. Linkages with corporations may overcome the funding aspects, to include valuable resources such as support in product development and prototyping, and sales/distribution agreements.

Creation of support mechanisms and partnerships to encourage cooperation of incubator clients with universities, corporations and the government.

### **Graduation**

The incubator should clearly define and communicate to applicants its graduation policies. Such policies should include the time limits, and the type/amount/value of services that would be provided by the incubator during the incubation process.

### **Business incubation overview**

Business assistance and facility-based services are described in more detail below.

### **Business assistance**

Incubators accelerate emerging Companies development by providing hands-on assistance during vulnerable start-up years. Assistance typically takes the form of a package of business and technical support services including guidance and mentoring on business strategy, management, marketing, financial, legal, and product development issues as well as facilitated exposure to a know-how network of outside business resources and sources of capital.

### **Facility based services**

Locating entrepreneurs in one facility creates opportunities to lower costs associated with supporting a new business. Incubators usually provide office space to a number of complementary businesses. Incubators offer flexible leases, shared use of conference rooms, reception, and other common areas. Incubators provide emerging businesses with an infrastructure of telephone, local area network and Internet services along with shared use of basic business equipment such as copier, fax machine, postage meter, and other office equipment. An incubator can give a new company a much-needed visible identity to help promote its offerings and find funding or investment capital.

### **Suggested objectives and mission**

The incubator would serve as a hub for technology start-ups and would actively identify and provide for the value-added services required to support incubator client's success.



Based on interviews completed during the business planning process, preliminary objectives that provide measurable outputs and outcomes to support the incubators mission may include the following:

1. Create new job opportunities for area residents
2. Create higher wage jobs
3. Better leverage intellectual property from the University and area research institutes
4. Contribute to the growth and success of emerging technology businesses
5. Generate new tax revenues for Lane County

### **Benefits to stakeholders**

If successful, the incubator would benefit a wide range of stakeholders in Lane County and beyond. Key stakeholders include incubator companies and their employees, the community at large, and area educational institutions. Major benefits expected to accrue to each of these stakeholder groups are summarized below.

### **Benefits to incubator companies**

Companies that are accepted into incubators enjoy dramatically improved success rates as their business enterprises are nurtured through early development years. Specific benefits include:

#### **Reduced barriers to entry**

The incubator environment would provide an .easy start. for emerging companies by offering affordable office space, access to shared equipment, meeting facilities, and on-site business and technical assistance. This lowers the overhead and operating costs during critical formative years.

#### **Networking and mentoring**

The incubator would facilitate a know-how network to address incubator companies. Unique needs for partnerships, suppliers, and/or potential sources of capital.

#### **Increased visibility and stature**

The incubator would significantly increase visibility and presence of tenant companies in the marketplace and advance their success potential. Admission to the incubator would imply an endorsement that enhances new companies statures and increase their chances to secure funding.

### **Benefits to the community**

The overarching benefit to the community is increased economic health and vitality. Specific benefits include:

#### **Job creation**

Incubator companies would create new employment opportunities for area residents. Technology companies typically create higher wage and higher skill jobs.

#### **Enhanced image**

A business incubator is one important element to enhance the Country's image as a progressive, future-thinking place that encourages and supports technology business development.

#### **Increased entrepreneurialism**

A business incubator can create awareness of entrepreneurs and stimulates confidence among individuals to consider opportunities for business creation.

### **Business development**

Established area businesses, especially those that develop relationships with early-stage companies, create long-term business opportunities as incubator companies grow and expand.

### **Increased tax revenue**

New jobs and new businesses in the incubator and those businesses that graduate from the incubator and spin-out into the community would generate a larger, more diverse tax base to support public services and contribute to many facets of community livability and health. Technology is seen as a clean industry with growth potential that aligns well with the State's economic development platform.

### **Allies and partners of business incubator**

The Business Incubator becomes an actual tool of regional economic development, that is why it is very important for the Initiative group that has decided to establish the Business Incubator to enter into partnership relations with all most significant local institutions: administrations of the municipalities, universities and other research institutions, public organisations, associations of entrepreneurs, financial and educational institutions, information services, etc. Even though creating such connections requires a great deal of efforts and work, the Initiative group has to prove the importance of the Incubator in the region in order to receive the necessary information from all the organisations existing in the region.

### **Students' participation in the activities of the business incubator**

Incubators often cooperate with local science institutions and have their set relations between students and the incubated companies that are satisfied with students' assistance. Joint projects could be very successful and significant for the activities of the incubated companies. Students can make marketing research, create accountancy systems and contribute in preparing the necessary documents for acquiring loans. The experience shows that programs conducted by students in training practice and the supervising teachers working with the incubated companies are successful when students have a well-formulated concrete task, which is useful both for a student and the incubated company. The programs should be made in such a way that mutual aims could be achieved: students acquire practical experience of working in a real company, and the incubated companies receive a concrete task performed. Besides, teachers always work together with students and they can directly communicate with the incubated companies and help solve the problems that might arise. They can also help the Managing Director of the Incubator with his/her consulting work.

### **Benefits of students' participation in the activities of the business incubator**

- Students' talent and skills can temporary contribute to the company's team;
- Opportunity of trying potential employees;
- Supervision of teachers of the educational institution;
- Valuable help at a minimal cost (if the students practical work is being evaluated, the company will receive it free of charge);
- Development of business talent can become a new source of founding business enterprises, or give the students opportunities to be employed in companies.

### **Shortcomings of students' participation in the activities of the business incubator**

- Time that is consumed by the Project Manager and main employees working with students in training practice;
- Time that is consumed by the Managing Director of the Incubator working with students, teachers, program coordinators;
- Responsibility for the results of students work.

### **Organizational structure**

There are three general options of legal and governance structures for business incubators with variations on each. General structures include:

- 1) Private, For-Profit Corporation

- 2) Independent, Not-For-Profit Corporation
- (3) Host Not-For-Profit Corporation
- (4) Structure as a Department of the University/Polytechnic

## Structure alternatives

### Private, for-profit corporation

For-profit incubators are usually established by venture capitalists or private corporations intending to spin-off internal technologies that lead to significant, short-term return on investment to corporate shareholders. Such returns are usually realized through an initial public offering or an acquisition of the start-up company.

A for-profit structure is well-suited to fast growth sectors that provide high-returns in a short period of time. This structure may be more attractive to sophisticated venture capitalists and angel investors which can increase an incubator's ability to attract new ventures due to improved access to sources of equity capital. A for-profit structure is easily established (relative to a not-for-profit structure).

A for-profit structure may not be best suited for an incubator whose overall mission is to provide for broader economic benefit to a region. With such a mission, ventures that would grow stable small and medium size businesses - for example, those that could provide for 10 to 20 new jobs and annual sales of \$5 million to \$10 million - may not meet the investment criteria typically sought by investors involved in a for-profit incubator.

### Independent, not-for-profit Corporation

Not-for-profit incubators are not driven by return on investment to shareholders and therefore can be well-suited to serve promising ventures that would provide for job creation and economic benefit to a region. A not-for-profit 501 (c)(3) structure also allows for access to charitable donations and public funds.

However, a non-profit incubator may experience greater difficulty in attracting investors and professional service providers to the program who want to see proof that a non-profit organization can be effectively run to promote the growth of new business ventures. Another challenge this structure poses is that the time required to establish a new 501 (c)(3) can be long. Incubator industry experts note that increased scrutiny by the Internal Revenue Service has led to increasing effort and time up to two years required for incubators to prove public benefit and gain status as an independent charitable organization.

### Host not-for-profit Corporation

A host not-for-profit structure entails that an incubator be established under the not-for-profit umbrella of an existing 501 (c)(3) corporation, such as a university foundation, community foundation, or economic development corporation. To be successful, incubators that operate under the umbrella of a host must meet the not-for-profit objectives of the host, but must be operated independently so that the incubator is not overshadowed by operations and culture of the host operation. Independent operations can be accomplished by establishing an incubator advisory board that acts in the capacity of a board of directors to provide strategic oversight to the incubator program while the host organization serves as the fiscal agent. The advisory board includes one or two representatives from the host corporation, and representatives from the investment and business communities who are experienced in new business start-ups.

A hosted not-for-profit structure allows the incubator access to charitable donations and public funds that are administered through the host 501 (c)(3). A hosted incubator allows for rapid roll out of the incubator project (compared to an independent not-for-profit structure). A strong host can also provide instant credibility to an incubator project.

A key concern with a host structure is the potential for conflict between the board and management of the host and that of the incubator. Such conflict can occur if the institutional culture of the host is not compatible to entrepreneurial enterprises. Careful attention to creating a governance structure that allows the incubator to operate autonomously with its own advisory council and management staff can help assuage this concern.

### Structure as a department of the university/polytechnic

Another structure that could be considered is to organize the incubator as a department of the University/Polytechnic. In this structure, incubator employees would be staff of the institution. This would entail that the institution see the incubator as an appropriate and logical extension of its current organization and mission.

The department structure clearly assumes the institution will continue to champion and, in fact, formalize its position

as champion of a technology incubator. A key benefit to this structure is that it could provide the human resources to expedite the implementation phase of the incubator should the project move forward. Another positive aspect of this structure is that, as a public institution, the institution is an eligible applicant for potential funding sources that appear most promising for incubator facility development.

### **Service offerings**

Incubator services and programs are designed to increase a client's likelihood of successful development and growth beyond what the client company could achieve on its own. Offering value-added services is key to the incubator's ability to successfully spinout graduates into the community and generates jobs and wealth in the region. Without these services, the incubator is little more than a benevolent landlord.

Incubator offerings are divided into four categories:

Direct business development assistance

Professional network and relationship support

Educational programs

Facility-based services

Incubator clients would have access to all core programs and services as part of their monthly lease agreement. Per unit service fees would be required for additional office services and special programs that may require client support fees.

It is important to underscore that the proposed incubator should work to develop cooperative agreements and referral relationships with existing resource partners throughout Lane County who provide services that support the growth of early stage technology businesses. These resource partners include, but are not limited to, LCC's BDC, area chambers of commerce, Lane Metro Partnership, Lane Workforce Partnership, cities, county, and state economic development, and business resources, etc. Such cooperation will avoid redundancy and redirect valuable time/resources toward services that address specialized and unmet needs of incubator clients.

Brief descriptions of proposed offerings are described in the section that follows. These offerings are based on a review of incubator literature and reflect perspectives gleaned from interviews with Lane County stakeholders and from interviews with representatives from three young or emerging technology businesses.

### **Direct Business Development Assistance**

Business development assistance is the direct support provided to clients from the time of acceptance through graduation. The incubator's Executive Director would provide oversight and facilitate access to resources that meet client needs as those needs arise over the course of their incubation.

### **Business Assessment**

This is the ongoing process of evaluating client business plans, identifying areas of need, developing a work plan to address those needs including identifying expertise and services needed to move the business plan forward, and timeframes for major tasks to be completed.

The initial assessment would occur upon acceptance to the incubator and follow on a monthly basis or as business issues dictate. The final assessment would be a graduation transition plan that links the young company to appropriate resources in the community. While the Executive Director would rely on a variety of resources and partners to assist the client in implementing the work plan, assessments and monitoring overall progress against the plan are key functions the Executive Director performs.

### **Professional Network and Relationship Support**

Networking and relationship support describes the active role an incubator takes to develop connections to resources that incubator clients might not otherwise have access to as small, emerging businesses.

### **Mentoring**

The incubator's Executive Director would develop a pool of volunteers willing to serve as mentors and business counselors for client companies. Mentors would be selected based on their experience with the client's industry sector and stage of development. The Executive Director would meet with mentors on a routine basis to stay abreast of the Company's development and suggest resources that would help the mentor best serve the client business. Feedback

mechanisms would be in place to ensure the mentorship is providing good value to the client.

### **Professional Network**

The incubator should develop a broad-based pool of high-quality professionals that have the technical and business skills needed to support client businesses. Services for such a network would be negotiated on a pro bono or reduced fee basis with guidelines for qualifications and level of service provided. The incubator would screen service providers, facilitate the interaction between the service provider and the client, and establish means to assess client progress and satisfaction.

### **Advisory Boards**

The incubator should also develop pools of professionals, technologists, and business owners that are willing to volunteer as advisory board members for client businesses. Such incubator advisory boards are usually composed of three or four people who have experience and expertise in the technology/industry of the incubator business. The advisory boards agree to meet with incubator clients on a regular schedule and provide counsel at various stages of the client businesses development. The incubator would screen board members, meet with them to monitor client progress, and establish means to assess client satisfaction.

### **Capital and Financing Network**

The incubator would establish and maintain relationships with a network of banks, angel investors, venture capitalists, and corporate equity investors through capital networks, brokers, and personal contacts. The incubator would provide introductions between incubator clients and appropriate investment resources.

### **Program Referral Service**

The incubator would maintain up-to-date knowledge of and relationships with established resources and programs in the area and provide referrals and information to incubator clients.

### **Intern Network**

Interns at the polytechnic / university, and other area educational institutions provide a talented, affordable work pool to support incubator and incubator client special projects on an ad hoc or ongoing basis. Areas of particular use to incubator clients include, but are not limited to, graduate level technology, law school/Legal Clinic, Lundquist Business School/Entrepreneurship Center, and Journalism/Communications.

The incubator should identify internship directors and establish a process that provides clients with the means to identify, screen, and recruit interns.

### **Educational Programs**

Educational programs include hosted, on-site seminars of interest to technology start-ups and incubator clients. This plan envisions that general business topics may be provided through the excellent resources of the polytechnic / university or other available community resources.

The incubator conference room would be used for on-site educational offerings and could be made available for other educational offerings that are consistent with the incubators mission if practical.

### **Hot Topic Seminars**

Seminars emphasizing topics of special interest to emerging technology businesses would be provided on a regular basis. Many incubators host such seminars on a monthly basis. The Executive Director would identify topics based on an understanding of incubator client needs and invite guest speakers with expertise in the topic area.

### **Business Topics Trainings**

The incubator should work with LCC.s BDC to provide incubator clients with access to the range of general business-related topics that are applicable to any start-up operation including financial, legal, organizational, marketing, insurance, etc. Depending on client demand and needs these offerings could be provided on-site at the incubator or off-site.

### **Commercialization/Licensing Seminars**

The incubator should host an annual educational seminar for area technologists to inform them about the challenges and rewards of technology commercialization, the processes and costs associated with licensing technologies, and area resources available to support those technology commercialization efforts. The seminars would bring technologists and entrepreneurs together and could be a tool for marketing the incubator to potential clients. A small panel of area experts would be invited to speak, such as the UO.s Director of Technology Transfer.

### **Resource Library**

The incubator would build and maintain up-to-date information resources for technology start-ups including resource directories, business form templates, and checklists. Incubator staff should be aware of the polytechnic / university and other area libraries that can provide additional resources to clients.

### **Facility based services**

Facility-based services involve flexible leases and other site-based services that are included in the basic rental package. Fee-for-service administrative support is also envisioned.

### **Space**

The incubator would provide access to office space that includes telephone, local area network, high-speed Internet access, and basic office furniture. Incubator clients would have access to shared conference rooms, restrooms and a kitchen/lounge. Security, janitorial, landscaping, and parking would be included in the rent.

### **Rent**

The Board and Executive Director will determine rental policy. While some incubators charge below market rent, others charge market rate or higher. Higher rates underscore the value of added services clients receive as well as reduce subsidy required for incubator operations. This approach should be seriously considered. However, in this plans financial analysis we have conservatively estimated that rents would be offered at the low-end of market for comparable space initially, and would escalate on a planned schedule. Escalating rental rates are intended to foster client orientation toward growth and graduation at a predetermined point in time.

### **Shared Office Systems Support**

Incubator tenants would have access to a common copier, fax, and postage meter and be billed a usage charge only. This business plan assumes a part-time receptionist would provide central reception and switchboard. This person may also provide secretarial support for client requests on a user-fee basis.

### **Client selection**

Client selection and graduation are critical to a successful incubator. The screening process should be customized to meet the incubators mission and ensure the firms selected can benefit from its value-added services. For a sample tenant application form,

### **Application process**

The proposed application process for prospective incubator clients involves two to three steps. The application process should be completed within about five days.

#### **Step 1: Complete Application**

All prospective clients would complete a brief application form. A completed application provides the incubator with a brief description of the applicant's current business status, and a very preliminary sense of the applicants service and facility needs.

## Step 2: Provide Business Description or Business Plan

Prospective clients that complete Step 1 and are determined to be a potentially eligible company would be required to augment their application with a business plan or written business description. The Executive Director and an individual with expertise in the applicants industry would review the document. It should provide more in-depth information about the stage of business development, stature of the management team, market potential, and overall potential for success.

At this point, if the business description or business plan adequately addresses screening criteria pre-established by the Board, the Executive Director could approve the applicant for acceptance and inform the Board.

If the Executive Director needs additional assistance to determine if approval is appropriate for an applicant an additional step would be added. It involves a brief presentation to an incubator panel as described below.

## Step 3: Present to Incubator Panel

The prospective client would present their business case to a small panel of three to four people comprised of Board members, appropriate industry experts, and the Executive Director. The panel's role is to assist the Executive Director in understanding the business case and determining if the applicant should be approved for acceptance into the incubator. Based on the panel's input, the Executive Director would make a decision regarding acceptance and inform the Board.

### Evaluation criteria

The criteria used to evaluate prospective clients throughout the application process should be based on the mission and objectives of the incubator and be compatible with the broad mix of technologies supported by the incubator.

Suggested basic evaluation criteria include:

The business should be a technology-related firm producing offerings that can be commercialized within three years. Compatible manufacturing firms that meet these criteria would also be eligible to apply, provided their space needs were compatible with the incubator facility.

The business must be in early stages of development. Early stage usually means within the first two years of business operations, but small companies involved in a significant change in direction or launching a new business product may also apply.

The applicant must show ability to pay incubator rents while they develop positive cash flow.

The applicant must have a management team that the Executive Director feels can handle the technical aspects of the business. The management team should have entrepreneurial business acumen or be willing to accept advice from an incubator established advisory board.

The applicant must want to take advantage of and be able to benefit from the value-added services and guidance of the incubator. The applicant business must be willing to take advice from the professional network and/or the Executive Director.

The applicant business must have the capacity for growth and provide economic benefits to the area including creating new jobs and opportunities for area suppliers and vendors.

The applicant must not be in direct competition with existing incubator businesses.

### Graduation policies

Graduation policies should be written into tenant lease agreements. Those policies should address time limits, value exchange, and resource commitments.

### Time Limits

A maximum amount of time for a client to receive services should be set. A fairly common standard is a maximum of three years, on a month-to-month lease. This can be customized by type of business and extended on a month-to-month basis for an additional year if indicated. In particular, bioscience companies generally require a longer time to get products approved and ready for market, and often require incubator services for five to seven years. Regardless of the specific time limits established, it is important to underscore that in discussions during the business planning process stakeholders strongly recommended a rigorous application of this policy. They see it as critical for achieving early wins and fostering ongoing support for the incubator.

### Value

The incubator should self-assess its ability to provide continuing value to a client. Clients who have progressed beyond the incubators ability to provide sufficient value should graduate and begin using private sector providers. Ongoing

business development assessments between the incubator management and client and the month-to-month lease structure facilitate this value assessment.

### **Resource Commitment**

The incubator should establish resource commitments and clarify expectations and responsibilities.

### **Anchor Tenants**

Unlike incubator clients who use the value-added services of the incubator and may receive below-market rents, anchor tenants are traditional research, development, and technology-based companies or companies providing professional services to tenants within the building. Anchor tenant rents contribute to the incubator's financial stability and these tenants lease agreements should be set for a term of three to five years. Anchor tenants will be selected and admitted based primarily on their compatibility with the incubator's community of clients and their ability to reliably pay the monthly rental fees for the term of the lease.

### **Characteristics of the managerial structure**

The incubator must always be understood as a business and, as such, must seek to work with a lean and competent managerial structure (Pereira and Pereira).

The managerial structure of an incubator is normally composed of three levels of management: board of directors, incubator management and consultant committee (Medeiros et al., 2008).

The number of companies aided by the incubator generally defines staff size. What is important is that the administrative structure must be lean, light and agile.

Also with regard to the composition of the board of directors or Council, Rice and Matthews suggest that the optimal composition would have the following members:

Leaders with a clear vision of the mission of the incubator and the capacity to motivate and support staff's commitment and mission;

Networkers or professionals with investment and professional services community connections;

Professionals that can aid the direct in operational and managerial activities;

Service suppliers and mentors who can provide companies with advice and facilitate the use of resources;

Venture capitalists, angel investors and bankers who understand the concept of business risk and provide enterprises with financing;

Entrepreneurs who developed successful businesses and are able to ensure that the incubator services are important for their clients;

Technicians who can help the director of manager to evaluate the technical components of the new businesses that are candidates for the incubator.

### **The concept of technology business incubation**

Technology and entrepreneurship are often reckoned to be the twin-horses pulling national economies towards their developmental destinations. Such a hypothesis is justified by the experiences of the developed countries, where technological developments supported by entrepreneurial initiatives have led to industrialization and economic development.

It has therefore become a developmental model for the less-developed countries to emulate, especially for the ones transitioning from protectionist to capitalist economies.

### **Emergence of technology incubators**

Since the 1980s, technology incubators have become an important focus of technology and innovation policies in North America, Europe and, more recently, Japan, largely due to the growing importance of small and medium-sized enterprises (SMEs). At the aggregate level, small technology-based firms are significant creators of employment, facilitate structural change and stimulate economic growth. About 93 per cent of high-tech firms in the USA have less than 500 employees and 70 per cent have less than 20 employees. While the reasons for different rates of performance may vary (e.g. access to capital, university links, competence centres), it is widely acknowledged that the creation and growth of technology-based firms can be inhibited by lack of finance, management skills, technology and access to markets.



Technology incubators are difficult to categorise and the concept of technology incubation differs widely from one country to another; incubators may be distinct entities within universities or science parks or be a part of innovation centres. In some cases, technology incubators are owned and managed by the host institution but with some autonomy or they may be owned by several stakeholders. In the USA approximately 30 per cent of business incubators are technology-oriented. In Europe the growth of technology incubators has been very much tied to the development of science and technology parks wherein incubators are part of an integrated process for helping tenant firms commercialise knowledge emerging from the park. In Germany, 73 per cent of all technology and business incubation centres are located either near universities or other research establishments. Newly industrialised and transition countries such as Mexico, Hungary, Poland and Russia have also developed business incubator programs, many of which focus on new technology-based firms.

Technology incubators require the active involvement of local stakeholders from the outset, including representatives from economic development

### **Technology business incubators**

Technology based enterprises (TBEs) are specially attractive to policy-makers because of their higher potential for job creation and wealth-generation through business growth as well as their lower disappearance rates compared to non-technology based firms. As new technologies are often developed in R&D institutions, it was such institutions in the Western nations that first took the initiative of providing incubation facilities to transfer these new technologies to the market. The model was later used by public and private agencies for facilitating technology development for new ventures. Such initiatives are now known by the common name of Technology Business Incubators (TBIs), some of which are focused on technology transfer and others on technology development for new ventures.

The emergence of Technology Business Incubators (TBIs) around the 1980s and 1990s may be attributed to the scientific advancements in biomedical technologies and the emergence of the Internet and the World-Wide-Web around the same time (Phan et al., 2005). Compared to nontechnology-based firms (N-TBFs), technology-based firms (TBFs) operate in more dynamic, uncertain and complex environments. Shorter product life cycles, limited entry barriers for potential competitors, need for collaboration among several parties, greater degrees of uncertainty associated with technology development and success, need for constant monitoring, high degree of dependence on specialized human resources and high probability of global competition constitute the turbulent environments in which TBFs attempt to survive (Manimala, 1994; Qian and Li, 2003).

Further, there are also differences a long other parameters such as the number of start-up activities engaged in, length of the gestation period, and sequencing patterns of start-up activities. Moreover, as TBFs experience greater degrees of uncertainty and complexity in their environments, they tend to direct more start-up activities towards planning, establishing legitimacy and acquiring resources, but not in marketing. Obviously they tend to have longer gestation periods (Liao and Welsch, 2003)

### **The role of business incubators in technology transfer**

#### **Technology incubators**

One of the major elements affecting the level of the economy's innovativeness is the transfer of modern technologies. This is connected with many other issues, such as commercialization of the results of R&D work or a dissemination of the most recent developments to the possibly largest group of recipients.

For many years in the developed economies actions have been taken to create an environment in favour of development of knowledge and to introduce mechanisms of transferring the results of this development to economic practice. Among more difficult barriers to overcome is the one of finding a common information exchange forum for scientists and practitioners. This problem is particularly complex in case of small and medium enterprises.

The ability of firms to innovate and grow is widely recognized as the fundamental driving force behind rising incomes and living standards. Small innovative firms, including new technology-based firms, are a major part of this process as they speed structural change and create new jobs to replace those destroyed by the decline of older industries or the downsizing of large firms. Public initiatives to foster the emergence of new and innovative firms have taken on an increased importance in many countries in recent years. In this context, business incubators have emerged as important tools of regional economic strategies and, more recently, technology and innovation policy.

In the case of technology incubators, support may be justified on the basis that market or systemic failures impede the commercialisation and diffusion of technology by new firms. The greater uncertainty associated with technology increases the risks inherent to new business start-ups; incubator services help reduce this uncertainty, thereby increasing

the chances for survival. On balance, evidence on survival rates of technology-based firms suggest such firms are in fact a lower risk, but the problem may be one of perception among investors and reflect different levels of experience in assessing risky projects (European Commission, 1996). Technology incubators are also supported as a means of increasing returns from public R&D spending by promoting its commercialization and diffusion.

## CONCLUSION

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.

Business incubation process adds value by accelerating the start-up of new businesses and maximise their growth potential in a way that is more difficult for alternative SME support structures to achieve. Mentoring, networking, and human resource development are formally acknowledged as being of paramount importance for the success of a business incubation process (Sipos and Szabo, 2006).

The manager of the incubator also has a key role in ensuring the added value of such organisations. The roles of the incubator manager are manifold from the daily operations of the incubator to the training and networking of the entrepreneurs as well as selection and coordination of the mentorship team.

Given the multitude of challenges being faced by entrepreneurs in emerging economies, there is a strong case for fostering incubation systems. The mentoring and business assistance provided by incubators are especially useful to individuals who are not part of business communities and/or do not enjoy support from families. Established businesses and promotional organizations associated with incubators would provide the latter's clients with the much needed know-how available in such networks.

Some general factors critical to an incubator's success include:

- On-site business expertise
- Access to financing and capitalization
- In-kind financial support
- Community support
- Entrepreneurial networks
- Entrepreneurial education
- Perception of success
- Selection process for tenants
- Ties to a university/polytechnic
- Concise program milestones with clear policies and procedures

Technology business incubators are recognized as a competent instrument for rapid and successful development of innovative start-ups to fully-fledged businesses in leading economies.

Creation and successful development of small knowledge-intensive innovative companies with strong interactive links to research institutions is widely understood as an effective tool for bridging the gap between the creative world of science and the competitive world of business and consequently putting this knowledge to work for productive purposes, a clear case of technology transfer.

In order to facilitate the transfer of technology from lab to market, many research institutions in Western countries have started offering incubation services to potential entrepreneurs. Successes of such institution-based initiatives have led to similar initiatives by other public and private agencies for developing technology-based entrepreneurial ideas into new ventures. Such initiatives are known by the common name of Technology Business Incubators (TBIs), some of which are focused on technology transfer and others on technology development for new ventures.

## RECOMMENDATIONS

The following recommendations highlight the most important issues to be considered by incubator managers, incubator stakeholders and policy makers.

### **Incubator managers and stakeholders**

Incubator Managers and Stakeholders should:

1. Design, develop and manage incubator programs in accord with the best practice principles defined for business incubators.
2. Segment the market for small growing firms in your region and target the design of your incubator program to meet the needs of the firms in the targeted segment/s.
3. Define the suite of business development initiatives that the incubator will deliver and build the cost structure of your program based on achievement of value added service delivery milestones, not real estate objectives.
4. Design your incubator program so that the manager can spend a minimum of 40% of time working with clients or enhancing other tools for value adding to clients. (eg networks)
5. Market your program on the its value-added management services not cheap rent.
6. Develop the capacity to maintain a thorough understanding of the strengths, weaknesses, business targets and performance of each client.
7. Devote most time and energy to the best performing firms.
8. Develop the capacity of your incubator to value add to clients by drawing on resources outside your direct control while maintaining the ability to achieve 5.

### Policy makers and program Managers

Developers of policy and government program managers should:

1. Encourage the development of business incubator programs based on the best practice principles identified in this Report.
2. Focus on business incubators for growing competitive firms to make a real net contribution to the economy.
3. Act to help compress the incubator industry life-cycle so that the shakeout period is minimised, thereby lessening the loss of resources and maintaining the viability of the industry, enhancing its rate of development and the enterprise development outcomes it produces.
4. Work with incubator stakeholders and managers to compress the individual incubator life-cycle such that the business development and expansion stages are achieved as rapidly as possible.
5. Predicate on-going support for an incubator on evidence that it is moving through its life-cycle and delivering increasing value to high value added enterprises.
6. Avoid short term financial assistance.

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