Impediments to Innovation and Entrepreneurship in Developing Countries: Implications for Science Parks and Business Incubators in the Knowledge Economy.

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Abstract

With globalization and the knowledge economy the world has changed, but have science parks and business incubators kept up with the times?

The paper analyses some of the impediments to innovation and entrepreneurship in developing countries, to draw out lessons for Science Parks and Business Incubators and to pose questions.

1. Is the combination of innovation and entrepreneurship a useful way in which to consider business incubation and technology parks?
2. How relevant is innovation for entrepreneurship?
3. How important is venture capital when most successful companies have 'bootstrapped' themselves?
4. Should ICT enabling of enterprises, in numerous sectors, be a focus?

The paper raises the topic of convergence and hybridization of Science Parks, Industry Clusters and Business Incubation to create innovative new models. The differences between each are only slight and convergence is happening by default, implying there are underlying principles common to each which may be useful for development of innovative new models.

Introduction

Skepticism abounds all over the world when it comes to business incubation, clusters and technology parks. All aim to foster growth of firms and associated wealth and employment creation, but, despite a long history, many governments and stakeholders question their relevance and the impact they achieve. With a desire to operate according to international good practice, practitioners may focus too much on operating a good business incubator, or science park, forgetting the needs of the entrepreneurs they aim to help and the state of the broader business environment in which they and their clients operate.

In considering models and principles it is important to consider entrepreneur needs as a foundation and to understand that only a small percentage of start up firms go on to grow. Those that do grow combine innovation and entrepreneurship, which are concepts that can be used to consider business incubation and science parks and other new and relevant models.

To remain relevant initiatives need to continually adapt and change to new environments. This is happening and some of the most exciting models bring together business incubation, technology parks, clusters and other initiatives. This convergence or hybridization, while blurring definitions and boundaries, is developing new models for the future and overcoming some of the duplication and fragmentation of effort that is all too common.

Innovation and Entrepreneurship

A country's primary goal should be to create a sustainable, high and rising standard of living for its citizens through sustainable economic, social and environmental development. The ability to reach this goal depends on increasing productivity, which in turn depends heavily on the enhanced and

sustainable innovativeness and entrepreneurship of SMEs in parallel with their growth and flexibility and the ability to develop complex products and services created by highly skilled and well paid people.
The primary challenge for countries, therefore, is to learn how to create the micro and macro environmental conditions for these types of firms to develop innovativeness and compete successfully in response to sophisticated global market demand and to learn how to create environments in which competitive firms (and the entrepreneurs charged with building and leading them) can thrive. This is a complex task when the vast majority of companies are micro in size and when many do not grow to become medium or large enterprises.

Innovation

There are many ways to describe the type of new knowledge that a society creates. For the purposes of this paper, I use an applied definition of innovation that includes the commercialization of that knowledge:

> *The process of creating new goods and services that provides unique value for customers who are willing to pay for that value*

Embedded in this concept of "new" goods and services are new ways of producing and selling them in a particular market, including new organizational structures. The concept also includes the innovation that occurs when ideas are transferred from outside a particular market and adapted for a new environment, and therefore does not define new as original to the species. This broader definition has also been described as "innovativeness."

Entrepreneurship

The number of start ups per adult population is the most basic measure of entrepreneurship. However, on its own it is not a very useful measure because the vast majority of start ups do not scale up and grow. The Global Entrepreneurship Monitor (GEM)[i] segments start ups into two categories: necessity entrepreneurs (NE), who have started a business because they "has(ve) no better choices for work"; and opportunity entrepreneurs (OE) who have started a business to take advantage of a business opportunity. The distinction is important because it determines the primary motive for participating in the start-up, whether they are willing volunteers (OE) or feel they are 'forced' into creating a new business (NE).
The Global Entrepreneurship Monitor (GEM) 2004 shows that many people around the world are involved in starting a business. Total Entrepreneurship Activity (TEA) reported in 2004 varied from a low of 1.5 percent of the adult population to a high of 40 percent with Uganda, Peru, Ecuador and Brazil emerging as the countries with the highest TEA. The level of entrepreneurship activity reflects differences in countries' national income, increasing or decreasing depending on their per capita income level and living standards.
Most entrepreneurs, according to GEM, are opportunity driven (OE) where there is a real and apparent business opportunity. Three in five (65%) are OEs and two in five (35%) are NEs. Rates of OEs vary between countries from a low of 1.1% of the adult population in Hungary to a high of 16.2% in New Zealand in 2005[ii]. GEM notes that only about 3% of start ups are those with high growth potential, that is businesses that expect to have few competitors, intend to bring innovations to the market and use state-of-the-art technology; a far smaller proportion than the OE proportion.
Other insights from GEM reports that help frame consideration of how best to support innovation and entrepreneurship are:

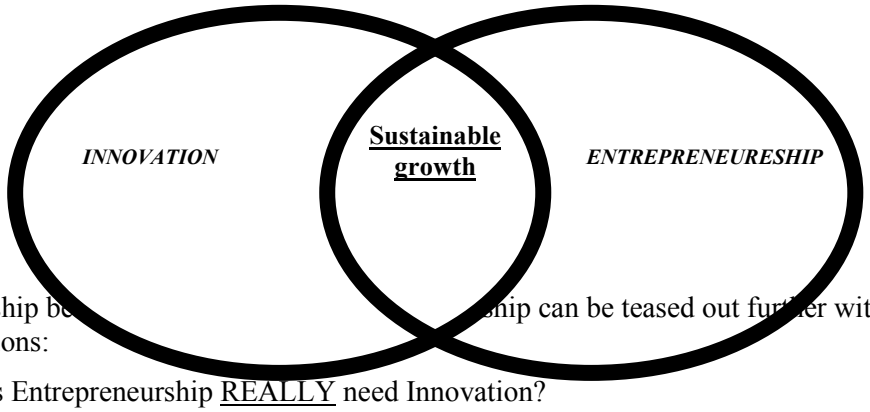
- Opportunity start-ups are exporting more products. A link exists between exports and NE/OE. As the level of NE falls, so does the proportion of start-ups that do not expect to export products. Over 50 percent of start-ups do not expect to export any products. Exporting companies are more prevalent in high-income countries. Low-income countries record the highest level of non-exporting start-ups and this reduces as nations become wealthier.

- Two thirds of start-ups expect to create either no jobs or, at most, up to two jobs within five years. The expectations of entrepreneurs in the low and high-income countries are similar with roughly 30 percent of respondents expecting to employ between three and 10 people and 9 percent expecting to employ more than 10. By contrast, the expectations of entrepreneurs in the middle-income nations are about 30 percent lower
- Young people tend to be more involved in entrepreneurial activity in every country regardless of the level of GNI per capita. The younger generation typically spur new business. Most entrepreneurial activity is carried out by 25-34 year olds, regardless of the level of income in their countries. However, IADB research into dynamic companies in Asia and Latin America, those that scale and grow significantly, defined as those between 3 and 10 years old and which increased their workforce to between 15 and 300, and which are the target for incubation, shows that they are started by people in their thirties following experience working in corporations or SMEsiii.
- Most entrepreneurs are already employed. The overwhelming majority of people starting businesses in all national income groups were employed while developing their business. In middle-income countries 91 percent have jobs. In high-income countries the figure is 81 percent and in low-income countries it is 77 percent.

Innovation and Entrepreneurship

Innovation is a crucial ingredient of Opportunity Entrepreneurship (OE), especially for high growth entrepreneurs who grow enterprises, create multiple high value jobs and export. The innovation may be in terms of technology, products, services or business management practices, all of which can help create sustainable competitive advantage, but which may be constrained, or enabled, by prevailing cultures (locally, regionally or nationally) of innovation.

Only a proportion of innovation leads to commercial application and growth firms, much never gets out of the laboratory or past R&D phases, and only a proportion of entrepreneurial activity leads to growth. The special space for incubation and other initiatives to foster growth firms is where the two coincide; innovation and entrepreneurship.



The relationship b ship can be teased out fur er with consideration of two questions:

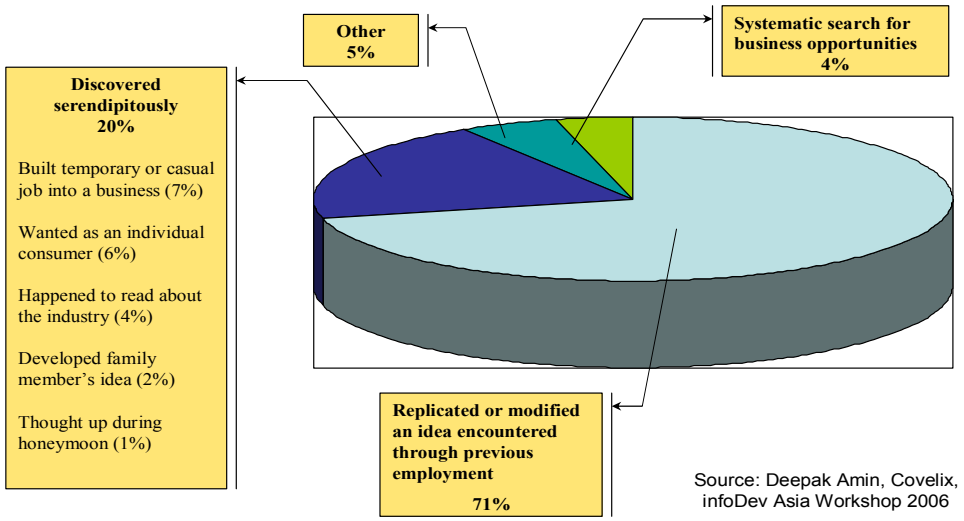
1. Does Entrepreneurship REALLY need Innovation?
2. Does Innovation and Pioneering work REALLY help an entrepreneur's business?

Research into the sources of start up ideas for top American countries has found that product innovation is not critical to commercial success. Business management, process innovation and execution of business models are far more important. With good business management second rate technology often succeeds ahead of the best technology. For instance, Betamax was a far superior video technology to the dominant VHS technology.

Innovators and Pioneers

Sources of Start-up Ideas

Percentage of 1989 Inc. 500 Founders Surveyed (Amar Bhide)

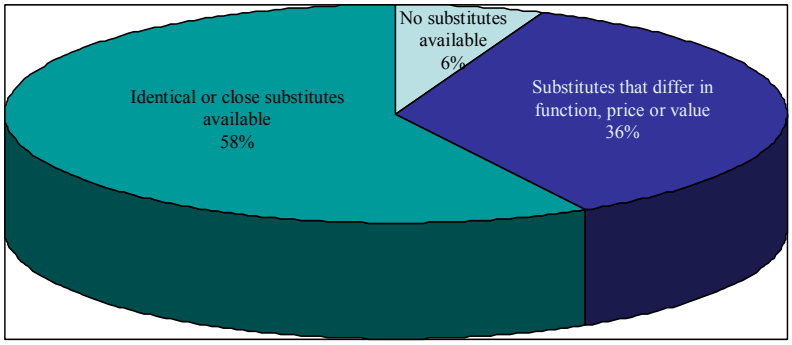


Source: Deepak Amin, Covelix, infoDev Asia Workshop 2006

Innovators and Pioneers

Uniqueness: Availability of Substitutes

Percentage of 1989 Inc. 500 Founders Surveyed (Amar Bhide)



Source: Deepak Amin, Covelix, infoDev Asia Workshop 2006

This research shows that first to market is over-rated. The proverbial first immutable law of marketing, it is better to be first, than it is to be better, may be wrong! History teaches the exact opposite; innovative idea/first to market is neither necessary nor sufficient.

The extent to which innovation and entrepreneurship matter can be debated, but the point I make is that for success in the commercial world it is all about execution of a business model by a management team and that technological innovation takes second place, noting the importance of innovation in terms of management, execution and business models and processes.

Impediments to Innovation and Entrepreneurship

Many challenges face most innovators and entrepreneurs in emerging markets, where the pursuit of opportunity is often undermined by the poor state of the wider environment – the 'business environment'.

Culture

A perceived lack of entrepreneurial attitudes holds back development of SMEs, with a mentality in many countries (including developed economies such as the UK) that copies rather than innovates and drags down success to the lowest common denominator, demeaning success and difference. In some countries this is called the 'tall poppy syndrome' whereby anyone who puts their head up (i.e. succeeds more than the average) is cut down to size. In Africa people have a joke about their neighboring countries, along the lines of: a man is walking down the road with a basket of live crayfish on his back. The basket has not lid and the crayfish keep trying to get out. It is not a problem though because the crayfish are from the neighboring country and as soon as one gets near the top of the basket the others all pull it back down.

In some developing countries the business environment is distinguished by the inherent absence of a strong culture of innovativeness and/or entrepreneurship, as is the case, for example, in many CIS countries (Commonwealth of Independent States, or ex-soviet countries) and Iran, where ambition is often channeled into government jobs and away from business as a pathway for talent. Practitioners often blame the local entrepreneurial culture when they have difficulty finding suitable entrepreneurs, or when their clients do not go on to grow. The problem may relate to the local culture, but other factors may be equally relevant. If business incubation attempts to have all entrepreneurs grow then this is an unrealistic expectation. The vast majority of enterprises do not grow and only a small proportion has realistic growth potential. GEM estimates only 3% of start-ups qualify as businesses with high growth potential.[iv] If clients are only selected on the basis of a business plan and without judgments about personal entrepreneurial capacity and sectoral growth prospects, then it is no surprise that growth does not result. The enabling 'environment in ones head' is as important as the enabling environment created by policies, regulations, infrastructure and access to finance.

A case in point is those incubators that endeavor to turn a mass of unemployed graduates into growing businesses, a laudable but difficult and possibly unrealistic endeavor, at least as far as growth firms are concerned. Fresh graduates lack the experience required for them to 'start and go' in business, whereas those who have worked (been "incubated") in the corporate environment or who have life experience are better placed to start and develop enterprises. There is a risk that these business incubation efforts, while worthy, may be targeting the wrong market, unless they select carefully. IADB research into dynamic companies, those that scale and grow significantly and which are the target for incubation, in Asia and Latin America, shows that they are started by people in their thirties following experience working in corporations or SMEs[v]. These are very different prospects to unemployed graduates who may have never had a job. BDS and other broader strategies may be more appropriate for market segments where growth is an unrealistic expectation, at least for early start up support.

The business models may simply be inappropriate and not attuned to the needs of new and growing SMEs or the local business environment. For example, trying to develop a traditional technology incubator in an environment where there is almost no R&D, a small domestic market and poorly developed industrial infrastructure may be a fruitless exercise, whereas another style of incubation tailored to the needs of growth oriented entrepreneurs in service industries may thrive.

Regulations

Policy and regulatory structures also often deter growth beyond the micro business stage, as in the case of Nepal, where a 'growth trap' has been identified, or impede investment because of legal and IPR weaknesses. If they do not exist already a range of laws and regulations may need to be instituted, to make it easy for people to start and exit from businesses (a feature of entrepreneurial economies is continual churn – people starting and exiting from businesses), to streamline regulation of businesses and competition and for the ICT Industry. These include:

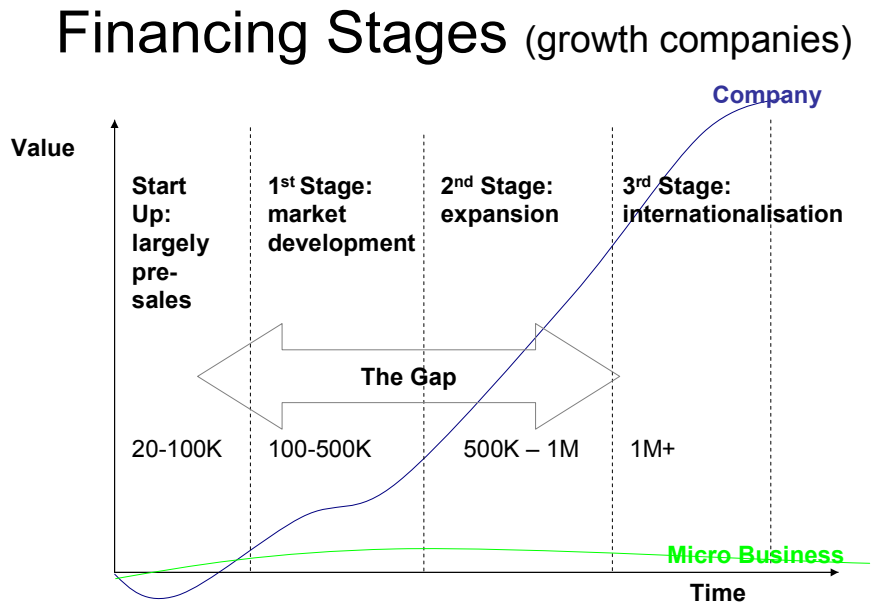
- Laws to protect intellectual property and copyright
- Streamlined processes for business regulation and business formation
- Laws to foster competition and control monopolies
- Laws to combat money laundering
- Laws for foreign direct investment, possibly including incentives.
- Streamlined laws and procedures to manage business exits and bankruptcy[vi]
- Consistent and transparent application of laws
- General acceptance of the rule of law
- Laws and regulations to reform the Telecoms sector, reduce monopolies and stimulate competition – to reduce costs to internationally competitive rates
- Laws to govern the ICT industry
- Laws to govern electronic commerce and data protection

In some countries, regions or environments, official corruption is an additional barrier to the effectiveness of the organizations established to promote entrepreneurship. Governments have an important role to reform their business regulatory regime, cutting red tape, introducing laws to facilitate protection of intellectual property and to control monopolies, along with making regulations more easy to use and transparent and with consistency of application.

Finance

Limited access to all forms of financing also impedes firm-level growth, technology transfer and commercialization. This challenge includes both supply and demand barriers. Appropriate types of financing are often not available to entrepreneurs in ICT and Knowledge-based industries in developing economies and access to banks and other institutions does not necessarily imply the expertise to properly assess risk. In China, for example, high savings ratios mean that banks have sufficient capital. For innovativeness to increase, however, Chinese banks must improve their capacity to recognize and embrace innovative companies rather than the state-owned enterprises that are more familiar. On the demand side, entrepreneurs often need a significant amount of technical assistance to prepare for outside investment.

Financing for SMEs needs to be considered in 4 stages: early stage (seed and pre seed), development (market development), first expansion and second expansion.

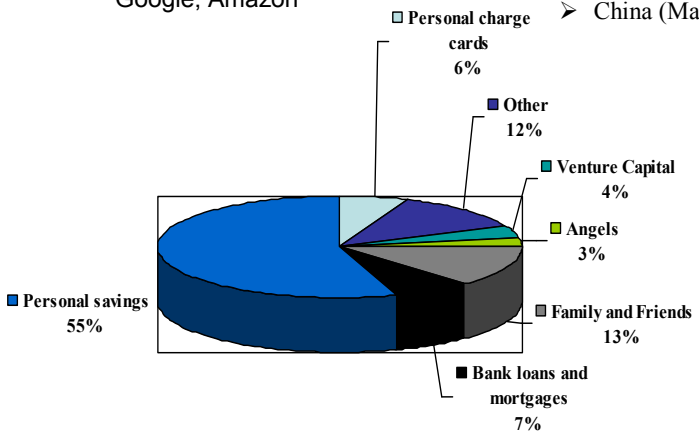


Generally finance gaps exist at the development and first expansion stages, although the quanta varies regionally, and it is a challenge at the start up or seed stage. Friends Family and Fools (the 3 Fs in 'Western' jargon) are very important for initial financing, but with low levels of trust in some countries, combined with poverty, limited property rights and sometimes no family, special financing mechanisms supported by governments are called for.

Venture Capital is not the answer, but one of the tools to be used, once firms have grown to a stage where they are of interest to venture capitalists. It is often a mismatch rather than a shortage of funds, with venture capital funds being skewed to larger and as a result often later stage deals, because of the high transaction costs and their operating modalities, and to large and vibrant economies such as China and India, leaving a shortage in other smaller countries and at earlier stages in the investment process. Research into how America's top companies started show the majority did not use Venture Capital.

Entrepreneurship

- **Boot-strapped**
  - Microsoft, WordPerfect, Dell, HP, Cisco, Infosys
- **VC-funded**
  - Lotus, Compaq, Netscape, Google, Amazon
- **Corporate "Intrapreneurship"**
  - IBM, HP, Xerox, GE, P&G, Microsoft
- **Governments**
  - United States (IT, BioTech, Nano, Space)
  - India (Defense, Rural IT, BioTech)
  - China (Manufacturing, Software)



Source: Deepak Amin, Covelix, infoDev Asia Workshop 2006

Case Study

Microsoft

- Bill Gates and Paul Allen
- First product BASIC for MITS Altair
- Not an innovative idea, 30 others!
- No significant revenue opportunity
- No thorough market research/business plan
- Nascent stage of PC industry, hobbyists
- Lacking business experience
- College dropouts
- Not very "fundable"

- Forced to boot-strap
- $5MM revenues in 5 years (1980)
- 9 years to book revenues that Lotus booked in first year!
- 10 years to IPO

Lotus

- Mitch Kapor
- First product Lotus 1-2-3: spreadsheet
- Not first or innovative
- Significant revenue opportunity ($24.9MM in year 3)
- Thorough market research, segmentation, business plan
- Proven industry, "mature" market
- Worked in the industry, serial entrepreneur (Tiny Troll, VisiPlot, VisiTrend). Worked on VisiCalc.
- Cybernetics degree, 3/4 MBA
- Had the necessary "endowments"

- Funded by Ben Rosen
- $53MM in first year
- 2 years to IPO!

Source: Deepak Amin, Covelix, infoDev Asia Workshop 2006

Angel investment, which typically helps fund companies at an earlier stage, is almost non-existent in some countries, despite many high net worth individuals and is a source that may be fostered in the future. Varying levels of social capital may be the reason why some countries, such as Argentina, have succeeded with angel investors, whereas others think it is not possible at the moment.
Incubators along with business organizations have a crucial role to play in helping bridge the gaps and making their clients 'investment ready' (addressing demand side issues) and to create an environment and a process so that investors (of any shape, size and motivation) trust what has been done and believe that it adds value for them.

Bootstrapping, making use of savings, investment from friends and family and retained earnings (starting and operating a business with little or no money or assistance from outside investors) is by far the most common strategy with successful technology companies. Incubators may be more successful in some environments if they help their clients bootstrap themselves, rather than helping secure finance that is simply out of reach or not available at an early stage.

Markets

Developing channels to international markets is another significant challenge for innovators and entrepreneurs, particularly those from smaller, more isolated economies. The high cost and limited access to ICT infrastructure, services and relevant knowledge, often impede the use of ICT as a tool for competitiveness or foundation for knowledge-based businesses. In small states where monopolies control supply of ICT and/or Telecoms, for example, broadband can cost up to ten times more than in developed economies, as is the case in many of the small island states in the Caribbean and some infoDev grantee countries.

General Impediments

The interrelated conditions that hinder entrepreneurship in disadvantaged economies have been studied by the OECD and have relevance for business incubation, which can help overcome many of the impediments and generate important role models and business networks.

OECD Barriers to Entrepreneurship in Disadvantaged Economies

1. Limited social and business networks – "Entrepreneurs who maintain and develop contacts with other entrepreneurs tend to become more successful than those who do not"
2. Low levels of effective demand in the local economy
3. The value and system of tenure of housing
4. Constraints in access to finance
5. Lack of work experience and skills amongst residents
6. Lack of role models – "The diffusion of entrepreneurship appears to involve an element of imitation…..having a husband who was self employed nearly doubled the likelihood that a woman would enter self employment the following year…almost half the entrepreneurs surveyed had immediate family members who had owned a business"
7. Cultural obstacles
8. Lack of personal motivation
9. Sectoral clustering – a disproportionate number of firms in mature, low growth easy entry markets, rather than higher value new and emerging sectors
10. High rates of crime
11. Problems of transition form reliance upon benefits
12. Government regulation

Source: Entrepreneurship and Local Economic Development: Programme and Policy Recommendations, OECD, 2003, pages 48 to 55

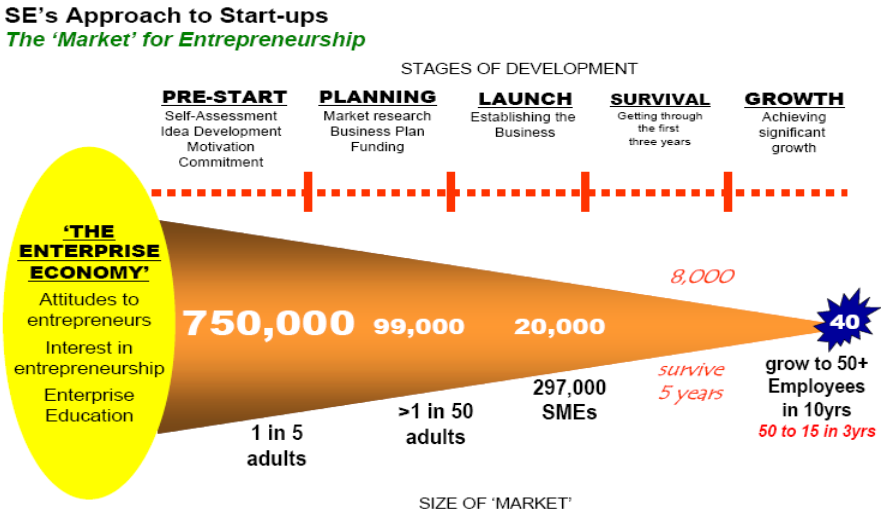
Support for Innovation and Entrepreneurship

The varied ways of supporting innovation and entrepreneurship attempt to help businesses surmount impediments they face. These will vary from region to region and country to country and should lead to varied models of support, adapted to particular local conditions. What is relevant for a science park or incubator in Iran may not be as relevant in Australia or other countries that have very different conditions.

Business Incubation

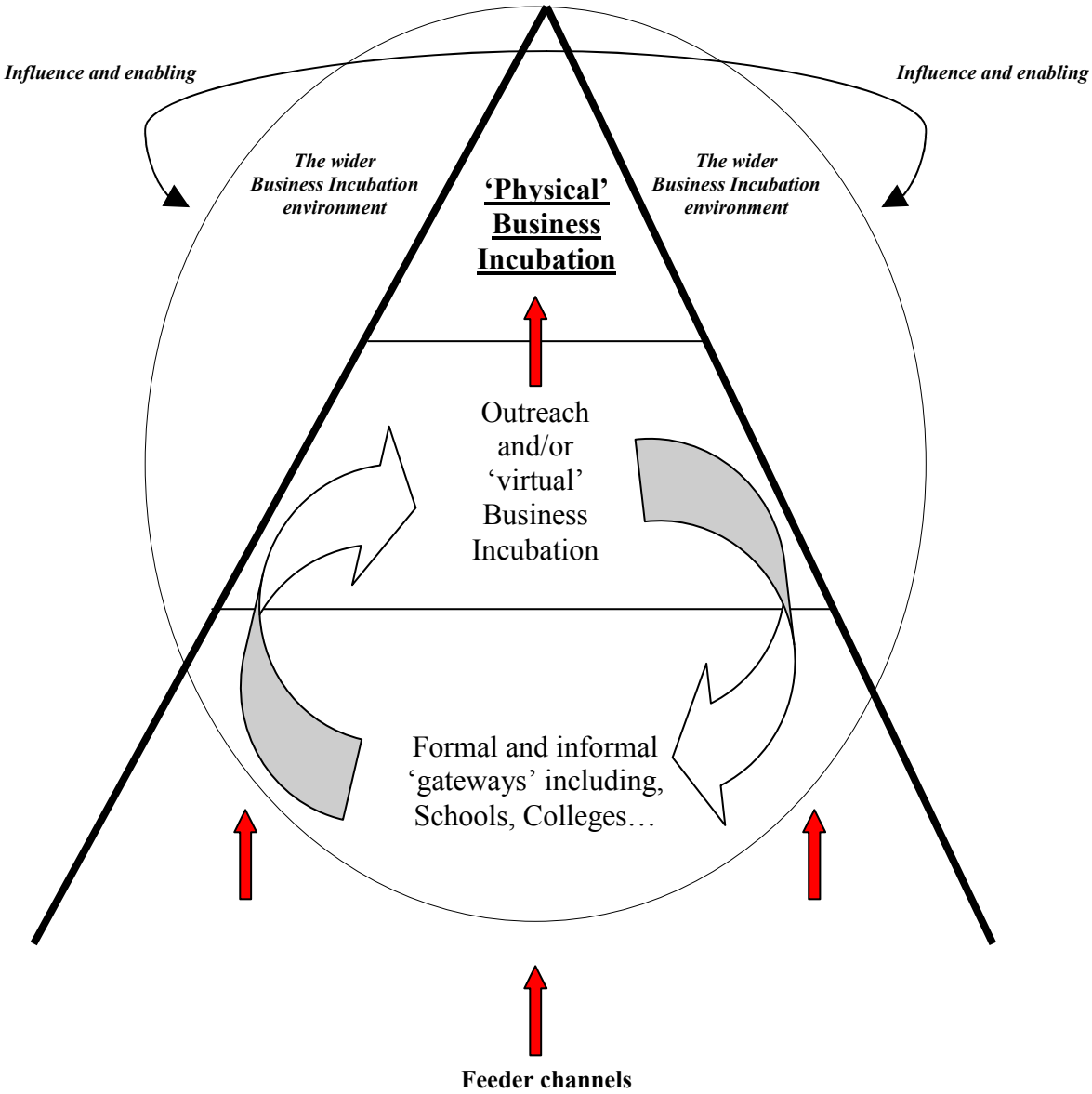
The goal of incubation is to foster and support not just any start up, however, but those with the capacity and capability to scale and grow, sometimes called dynamic enterprises. These are only ever a very small minority of all start ups. Many development initiatives do not lead to growth and scalability, for many reasons, including the state of the business environment and access to capital, but also and of particular relevance to incubation because of poor targeting. Practitioners do not always realize the importance of careful targeting or the scale that is required to secure a critical mass of growth firms for incubation.

Speaking at the infoDev Middle East and North Africa Workshop in January 2006, Sheila Robinson, a business consultant, talked research in Scotland that indicated a population of 750,000 was required at one end of a funnel to deliver 40 dynamic companies with 50+ employees in 10 years time (see below). She noted that outreach activities and workshops improved and enabled the entrepreneurial culture and reduced the population required to 350,000. Scotland is not a developing country (although parts of it have lower population density than Siberia and some of the island communities are very isolated), but the concept of a funnel and outreach services, to deliver a critical mass of clients to a business incubator are important.



Across the globe and especially in developing economies, the challenge is to filter out those business ideas, technologies and innovations that have scalable prospects and blend and bond them with entrepreneurs who 'have what it takes' – clearly there is also a need to actively support and 'signpost' the many other enterprises that have merit. Throughout the developing world there is undoubtedly a rich vein of 'raw material' that can feed into a 'growth chain' or 'funnel' (see below) that culminates in the process of pure Business Incubation. Recognizing the infrastructural, social, environmental and economic challenges that face many parts of the developing world, formal and informal 'gateways' including, for example, 'outreach programmes', Schools and Colleges, are likely to be a permanent 'seedbed', need and opportunity.

The 'funnel' leading to Business Incubation



Business incubation is only a cost effective and useful intervention for *growth oriented businesses*, as opposed to lifestyle businesses, or those without the aspiration or potential to grow and create new wealth and jobs. Growth and high growth however are not the sole preserve of high technology commercialization, in which the risks are astoundingly high and a 10% to 20% success rate is the benchmark. Service companies, which are generally involved in selling knowledge and knowledge applications, can achieve astounding growth and employment, and often do not need any where near as much initial capital.

Category	Conditions
Fast growth	Average growth of 10 staff per annum, or doubling of turnover every year since entry to the business incubator
High Growth	Turnover grows by a factor equivalent to the number of years of trading (i.e. trebled in 3 years), or by the same amount each year since entering the business incubator
Steady Growth	Growth at slower rates than above
No Growth	No growth in turnover or employment since entry into the business incubator

A useful approach is coming from the UK, which classifies client firms by growth[vii]:

One legitimate fear stakeholders might entertain is that if a business incubator does not focus upon a particular industry sector, focus and valuable industry knowledge may be diluted. Without doubt specialized business incubators can have advantages. Services can be focused on the needs of the industry, industry synergies can be fostered and business incubator management can develop considerable expertise in that industry. For these reasons many practitioners and commentators, typically from large developed and developing economies argue that business incubators should be specialized; assuming there is critical mass in the area of specialization. This argument needs to be considered carefully by business incubator proponents in SIDS, because specialization will limit the potential market and may result in a business incubator not having adequate critical mass. Sometimes the advantages of non-specialization are overlooked. Cross industry linkages can be capitalized upon (e.g. high tech software developers still need access to a range of services and all businesses need to be ICT enabled to grow) and the target market is larger. Sometimes reality belies the debate. Technology business incubators are appealing icons for development, but often in developing countries incubate many ICT service companies that are more typically found in mixed use business incubators in developed countries; the R&D based technology commercialization companies found in developed country technology business incubators may be non-existent in the country concerned, especially smaller countries without an established industrial base.

Most successful business incubators, whether high tech or general, are not specialized in a particular industry sector. Specialization limits the market being served and increases the risk, at the same time as reducing the potential economies of scale.

More commonly, specialization is not exclusive and is achieved by themes or clusters within the one business incubator. For example, a business incubator may have a range of different clients and 'mini-business incubators' within the overall structure, benefiting from specialization and non-specialization, without limiting the market being served. There are many examples. One is the San Jose Environment and Software business incubators (called Environment and Software Clusters), which are branded separately, but with common management and in the one building. Client industry specific needs can be addressed by using specialized business coaches or staff. Furthermore, business management principles and skills do not vary much between industries.

Varied ways to support Innovation and Entrepreneurship

A range of entrepreneurship services exist sometimes referred to as a business development toolbox. Some are not selective and provide services for the vast majority of enterprises, mostly micro and self employment, such as BDS and Business Advisory Services. Others are selective and focus on dynamic growth oriented firms, such as business incubation, cluster development and science/technology parks. For all, improvement to the prevailing business environment is crucial; they do not operate in isolation. All too often activity is fragmented and not coordinated, complicating the situation.

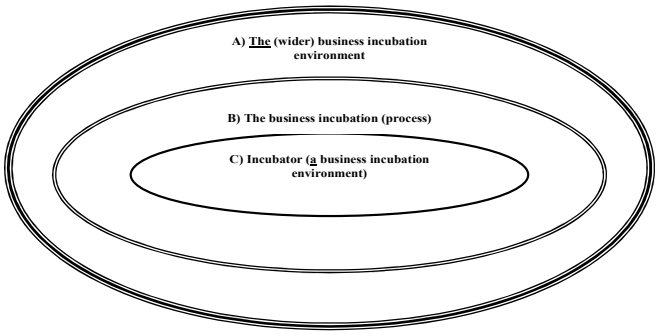
The main services that relate to the space in which incubation operates are summarized in the following table.

Complementary Activity	Key Features	How a business incubator differs
Technology Park – also called Cyber Park, Science Park, Research Park and Techno pole	• Linked with educational or research institutions • Provides infrastructure and support services for businesses, particularly real estate and office space • Performs a technology transfer function • performs an economic development function • Accommodates large and established businesses • Often involves business incubation of new companies • May focus upon a particular industry, often ICT, or be more general in nature	The most important difference is that business incubation focuses on growing new companies which will leave the business incubation program when ready (graduation). In some Parks when this occurs they do not have to move physically, but the designation of their space changes from business incubation to Park space, and in others, with dedicated business incubation space, they move to another building in the Park.
Industry Cluster	• Geographic concentration – spatial proximity of businesses • Specialization around a core activity to which all actors relate • Multiple Actors, including firms, public authorities, academia, members of the financial sector and collaborative institutions • Competition and cooperation between the actors • Critical mass to achieve the necessary inner dynamics • The cluster life cycle with a long term perspective • Innovation, with firms in the cluster involved in technological, commercial or organizational change[viii]: Business networks are different to clusters, although the two terms are sometimes used interchangeably. Business networks are generally closed organizations, generating external economies for members by sharing costs of resources, expertise and information. Clusters are open and derive external economies from the market.	As with Technology Parks graduation is not a feature of clusters. Clusters by definition focus upon a particular specialization, often an industry sector or sub-sector. Some clusters involve business incubation but it is not as common as with Technology Parks.
Business Development Service (BDS) and **Business Development Centre**	Generic services for small enterprises and business aspirants typically providing: • Information • Training • Advice Most variants rely upon private sector service providers, coordinated by the service.	Business incubation is a more focused, intensive and selective service for the percentage of firms that have growth aspirations and potential. This is only ever a minority of all businesses.

Definitions of and Technology Parks, Clusters and Business Development Services keep evolving, as with business incubation. Indicative definitions of each are below, to assist consideration of how they may be integrated with business incubation.

Business Incubation

A Global concept on the wider environment …



- **The (wider) business incubation environment is the wider context which should be conducive to the sustainable nurturing of growth potential and the development of enterprises.**
- **The business incubation process is a public and/or private, entrepreneurial, economic and social development process designed to nurture business ideas and start-up companies and, through a comprehensive business support program, help them establish and accelerate their growth and success**
- **Incubator (a business incubation environment) is a physical space or facility that accommodates a business incubation process**

A) The (wider) business incubation environment
B) The business incubation process
C) Incubator (a business incubation environment)

At the Global Forum on Business Incubation in Delhi in 2004, the Global Summit meeting (of all national associations and national groups/stakeholders) recognized the need for a model of business incubation environments (above) that recognized:

- The (wider) business incubation environment is the wider context which should be conducive to the sustainable nurturing of growth potential and the development of enterprises.
- The business incubation process is a public and/or private, entrepreneurial, economic and social development process designed to nurture business ideas and start-up companies and, through a comprehensive business support program, help them establish and accelerate their growth and success
- Incubator (a business incubation environment) is a physical space or facility that accommodates a business incubation process

This model recognized the increasing maturity of business incubation globally and the continuing and on-going need to understand that it is part of a wider process and not just a building.

Technology Park (synonyms: science park, techno pole, research park, cyber park)

The International Association of Science Parks (IASP) defines a Technology Park as: "A Science Park is an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and Knowledge-based institutions. To enable these goals to be met, a Science Park stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through business incubation and spin-off processes; and provides other value-added

services together with high quality space and facilities. The expression "Science Park" may be replaced in this definition by the expressions "Technology Park", "Techno pole" or "Research Park".[ix]

Industry Clusters

Clusters rose in prominence with the publication of Michael Porter's Competitive Advantage of Nations (1990). They are generally defined as: "A process of firms and other actors locating within a concentrated geographic area, cooperating around a certain functional niche and establishing close linkages and working alliances to improve their collective competitiveness"[x].

Business Development Services

The scope of Business Development Services is outlined in the Business Development Services for Small Enterprises: Guiding Principles for Donor Intervention, 2001: "Business Development Services include training, consultancy and advisory services, marketing assistance, information, technology development and transfer, and business linkage promotion. A distinction is sometimes made between "operational" and "strategic" business services. Operational services are those needed for day-to-day operations, such as information and communications, management of accounts and tax records, and compliance with labor laws and other regulations. Strategic services, on the other hand, are used by the enterprise to address medium- and long-term issues in order to improve the performance of the enterprise, its access to markets, and its ability to compete."[xi] Two important principles with BDS, which distinguish it from Business Advisory Services and Development Centers, are:

1. Building the capacity of private and other providers – the supply of BDS services
2. Raising awareness amongst SMEs of the value of making use of BDS providers – building the demand for BDS services.

Business Advisory Services (BAS) and Business Development Centers (BDC)

These services provide generic business support services to SMEs, including information, training, advice and assistance raising finance. They differ from pure BDS services in that the support is provided by the BAS or BDC, contrasted with the BDS principle of building capacity of private and other service providers. Many services combine both approaches. The main difference to business incubation is that they are generally commonly available to all entrepreneurs rather than selecting and focusing only on the small percentage of growth oriented and capable firms.

Other possibilities

These are not the only possibilities, Special Trade Zones and Investment Promotion Agencies are two others, and creativity is called for in considering how business incubation can converge with related initiatives and, through hybridization, create something new and dynamic.

In China almost 500 technology business incubators have been established under the Torch Program in special 'New and High Technology Development Zones', allowing the companies incubated to receive attractive taxation benefits. Many of these business incubators could just as easily be called Science or Technology Parks and many have a specific industry sector focus, akin to clusters.[xii]

In Singapore under "Enterprise Ecosystem Policies', incorporating enterprise facilitation and business incubation, foreign firms, governmental enterprises, and both domestic and foreign small/medium sized firms are developed together. "The desired outcome is to create a vibrant self-renewing and self-sustaining enterprise ecosystem that is connected to the larger global ecosystem. We cannot manufacture entrepreneurs but we can create the environment and conditions that allow, encourage and facilitate entrepreneurship.[xiii]"

The extent of other services in a community in part determines the scope of incubation. Where there is limited BDS activity on which to build, incubation will need to stretch to working with a broader range of clients, in pre-incubation or outreach programs, to groom and select those firms that can grow for more intensive incubation support.

Convergence and hybrids

Reflecting on the past and looking to the future, the term business incubation may no longer provide the most useful lens through which to consider the range of relevant innovation and entrepreneurship activity. Business incubation is only one way in which to support the start up and growth of firms; one that has a high profile in a community but is not a panacea. Other initiatives may be more appropriate for a particular situation. The refined definitions and sophisticated good practices that have evolved over the last twenty years can restrict thinking in countries that are trying to 'catch up' and match developed countries rather than encourage innovation with locally relevant solutions. This can lead to a focus on business incubation rather than its customers and the ultimate goal of fostering innovative and entrepreneurial firms. Traditional business incubators often only deal with a small number of companies (typically 30 or so) and do not have the reach and scope that is called for in many countries, in which thousands or hundreds of thousands of new firms are needed to cope with unemployment problems. With outreach and virtual services many business incubation organizations in developing countries are now trying to reach a far wider target market and are stretching concepts. Furthermore, business incubation need not be restricted to new start firms, the most common market, as is being shown in New Zealand where existing firms are being taken through a business incubation process to take them off shore to export markets.

The business incubation market is normally new start companies, but in New Zealand, an isolated developed island country with limited population, the Upstart business incubator in Dunedin, a small regional City, has pioneered business incubation of existing SMEs by taking them to new international markets, for a small percentage of their revenue for a 3 year period. These companies do not necessarily move into the business incubators premises; they already have their own, but are considered as outreach clients for the business incubation program. Upstart CEO Norman Evans says: Upstart gives a leg-up to companies who want help to grow fast and generate revenues in the millions. They may be one person start-up companies, or successful small businesses, but each Upstart client is on a mission to rapidly increase their company's value, without greatly increasing their risk. Our mission is to help their growth dreams become real."[xiv]

New concepts and terminology may be needed that encompass incubation science parks and cluster development, along with other (business) services supporting growth enterprises, within the framework of supporting innovation and entrepreneurship to achieve scalable growth.

Technology Parks (synonyms: Science Park, Research park, Cyber Park, Techno pole) and Industry Clusters may be grouped together with business incubation as 'collaborative networks' involving a 'place' and work with growth companies. At the other end of the spectrum are Business Development Services (BDS), which support small enterprises, mostly micro enterprises and family based, and business aspirants, without a focus on growth but serving large numbers of people. Incubation can build on traditional BDS services with more intensive support for those enterprises that have growth prospects and capacity. New convergent or hybrid models are evolving in a number of countries; something that is often overlooked with the current typology and compartmentalization of activities. With prevailing typologies, a business incubator is looked at through a business incubation 'lens' and associated good practices, a technology park through a technology park 'lens', and activities that do not fit either are often not seen at all. To properly appreciate and understand the new and emerging hybrid models a new 'lens' is required, one that does not miss any of the important elements, which may be concentrated at the margins. The sophistication of practices and thought linked to the current typology can be very useful, but at times is akin to trying to look at a tree through a microscope.

Where there is limited critical mass, such as in small economies, there are good arguments for initiatives be combined, to maximize critical mass and capability, with convergent or hybrid models - perhaps in the form of 'hubs' and 'spokes'. Innovation Waikato in New Zealand, a small but developed island country, is just such an example with a park, cluster and business incubator all together, focusing on regional industry and R&D strengths in bio-science and ICT. (See below).

Innovation Waikato: Technology Park, Bio-Tech Cluster and Incubator.
Innovation Waikato has become the centre of excellence for Innovation in the Waikato region providing...

A network of deep subject matter expertise in Life Sciences, ICT and Hi-tech sectors.

A culture of collaboration and innovation between research, entrepreneurs and business.

A core facilities building providing business infrastructure ready to accelerate and incubate new business.

On site and networked professional services to effectively mobilize new business.

Shared services to allow businesses to focus on their core processes, services and products.

16.8 hectares of science park for mature business research and development functions.

www.innovationwaikato.co.nz/

The analogy and strategy adopted by Singapore, to develop a vibrant and self-sustaining enterprise ecosystem that promotes the formation and growth of enterprise, may be useful as a policy and conceptual way forward. Work with both domestic and international firms together, to maximize cross fertilization, is at the heart of the strategy (see below).

The Economic Development Board (EDB) is Singapore's lead agency responsible for planning and executing strategies to sustain Singapore's position as a compelling global hub for business and investment.

We work closely with local and foreign companies across a diverse range of activities in both manufacturing and services to help them move towards higher value-creating operations in an increasingly Knowledge-based and innovation-driven environment. We also encourage companies to use Singapore as a headquarters and total business centre to manage their global or regional functions to service their global or Asia Pacific operations.

Singapore is today a "Global Entrepolis" - a compelling global hub for business and investment where entrepreneurs and enterprise converge, spark and realize innovations, forge partnerships, and create value in manufacturing and services industries. EDB acts as a catalyst and facilitator to ensure a thriving "enterprise ecosystem" in Singapore. We encourage innovation and entrepreneurship by helping to create an environment which is conducive for start-ups and companies of all sizes to interact with each other with good corporate governance practices and where intellectual property is protected.

Source: Economic Development Board Singapore: http://www.edb.gov.sg/edb/sg/en_uk/index/about_us.html

Convergence and hybridization is not just happening in the technology incubation space. Established in Ghana in 2001, Busy Internet is the largest privately owned & operated ICT centre in Africa. With a unique mission to provide both commercial services as well as social development, Busy is a promising ‘hybrid’ model for Africa. Services offered include:

Meeting Rooms - rooms for up to 200 people - video-conferencing - state-of-the-art projection - 30 high-speed workstations - overhead projectors - high-quality catering - document preparation services - event planning services	**Cyber Café** - your own private accounts - private file storage (free) - broadband internet - excellent customer service - over 100 flat screen PCs - free internet advice - games, videos, music - extensive software library	**Serviced Offices** - project offices for one day/week - plug and play - voicemail & internet - fully-serviced - community of IT experts - business incubation program
Other services - voicemail - DHL worldwide shipping - video-conferencing - website design - website hosting - large-file downloads/uploads - premium software	**Copy Centre** - state of the art printing - laminate/bind/scan - digital sender & fax - drop off service	**BusyAccess ISP** "we're here to get you online: simple, fast, & dependable"

Source: http://www.busyinternet.com/

Busy Internet, with shallow and broad services for more than 1,000 customers a day suits the local and difficult business environment, where regulations are not easy or transparent, reliable broadband Internet access is difficult, power and utilities often fail, there is limited venture capital, local markets are limited and international markets are difficult to access and where there is a weak culture of entrepreneurship and innovation.

ICT Enabling

It is widely recognized by all Governments that economic and social survival, development and sustainable growth are inextricably linked to enabling access to and achieving success within, regional and global markets. For the vast majority of citizens this can only be achieved through and facilitated by, the wider use of ICT and greater understanding of the challenges of regional and global competition and accessing new (niche) markets. However whilst enabling wider use of and access to ICT will enable access to information, it will not automatically enable access to Knowledge – or its application.

The OECD notes research from France and the USA showing that Internet use is associated with superior performance[xv]. They report small industrial firms in France growing twice as fast as non-Internet users, with twice as much export, higher revenue per salaried person, higher added value, and superior job creation and, in the USA, higher small firms revenues compared to non-users. However, it is unclear whether Internet adoption caused superior performance or vice versa. This debate may not be especially pertinent if it is a challenge to simply provide broadband Internet and access to information at internationally competitive rates; if Internet adoption causes superior performance then more competitive access is important and if superior performers are those that adopt the Internet than at least they will have competitive access.

To compete internationally, businesses need to be ICT-enabled to minimize the tyranny of distance, isolation and cultural barriers, communicate with customers and suppliers, and undertake market research, so as to make informed decisions and find the high value niche markets in which they can compete, and to improve logistics.

ICT enabling is not well understood and is sometimes considered as a proxy for the ICT industry. An important lesson is that ICT is just a tool, an enabling technology, but not an end in itself. When it comes to securing sustainable competitive advantage, ICT enabling is just as if not more important than development of the ICT industry, with great potential in agriculture, manufacturing and services, not to mention for leaning, information and market knowledge.

In one sense 'ICT-enabling' is a simple term with a common sense meaning, but a strict economic definition of an ICT-enabled business is along the lines of a business whose existence crucially

depends on ICT, or where operating modalities have been significantly enhanced by ICT. This includes the BPO industries, ICT consulting services, ISPs, web designers, producers of e-content, Telecentres, distance learning and other enterprises where ICT is 'mission critical'. These are important emerging sectors for many developing countries but the productivity and efficiency improvements that occur once any business adopts ICT should not be overlooked. In other words ICT enabling cuts across most industry sectors and is not restricted to the ICT industry.

Conclusion

In the new knowledge economy business incubators and science parks need to consider new ways of thinking about the space in which they operate to remain relevant and to maximize impacts.
Rather than segregating business incubators, technology parks, clusters and other initiatives aiming to facilitate the development of growth oriented firms, it may be more useful to think in terms of the conjunction of innovation and entrepreneurship. Where these two concepts combine sustainable growth occurs, but all too often investments in incubation do not lead to sustainable growth of the firms assisted. New hybrid and convergent models, in which a range of varied activities are combined, may well be more relevant and achieve better impacts. ICT enabling enterprises, whether they are technology oriented or in service industries, has great potential for business development in all sectors and needs to be accommodated in new models, particularly those that reach beyond the walls of physical facilities and as a part of public policy.

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[i] www.gemconsortium.org The Global Entrepreneurship Monitor consortium is an initiative of Babson College in the USA and the London Business School in the UK with involvement of national teams for participating countries.
[ii] Entrepreneurial League Table, taken from GEM Aotearoa New Zealand 2005 Executive Report.
[iii] Entrepreneurship in Emerging Economies: The Creation and Development of New Firms in Latin America and East Asia, Inter-American Development Bank, 2002.
[iv] Global Entrepreneurship Monitor, 2004 Executive Report.
[v] Entrepreneurship in Emerging Economies: The Creation and Development of New Firms in Latin America and East Asia, Inter-American Development Bank, 2002.
[vi] A feature of entrepreneurship in the USA is that failure and bankruptcy does not leave people in absolute penury, is addressed quickly and is not something to be ashamed of. It is appreciated as a learning exercise and many successful entrepreneurs failed in their first few attempts.
[vii] *UK Incubators Identifying Best Practice*, UKBI, 2001, Table 2.2.2. Page 33.
[viii] The Cluster Policies White Book, Andersson, Serger, Sorvik & Hansson, IKED, 2004.
[ix] http://www.iasp.ws/information/definitions.php?ce=
[x] The Cluster Policies White book, IKED, 2004, referring to "the Competitiveness Institute Preparatory Course".
[xi] Committee of Donor Agencies for Small Enterprise Development, Secretariat: SME Dept., MSN F2K-207 World Bank Group
[xii] Summary information can be found at the Asian Association of Business Incubators site:
http://www.aabi.info/directory/Shanghai01.html
[xiii] http://www.aabi.info/directory/Singa01.html
[xiv] www.upstart.org.nz
[xv] Entrepreneurship and Local Economic Development, Programme and Policy Recommendations, OECD, 2003, page 142.