CHAPTER 2
BUSINESS INCUBATOR EVOLUTION, SERVICES AND MODELS

A detailed account on the business incubation genesis, various models in operation and services rendered by incubators are discussed in this chapter.

2.1 EVOLUTION

The term ‘Incubation’ can be traced back to a practice in ancient Greek temple wherein people sought a new vision or to overcome a disease by lying down on the skin of freshly sacrificed animals. The essence of incubation from this kind of ‘disease cure’ has been adapted to the world of medicine in an environment where prematurely born infants were nurtured and taken care of. Similar to the medical incubation systems, BIs nurture young firms, helping them to survive and grow during the start-up period when they are most vulnerable. However, instead of speaking about business incubators as a real or virtual place for incubation, perhaps it is better to emphasise the more dynamic elements of the incubation (Aernoudt 2004).

Among researchers and professionals there is a consensus that the first incubator was established as the Batavia Industrial Center in 1959 at Batavia, New York (Lewis 2002). A local real estate developer acquired 8, 50,000 square feet building left vacant after a large corporation exited the
area. Unable to find a tenant capable of leasing the entire facility, the developer opted to sublet subdivided partitions of the building to a variety of tenants, some of whom requested business advice and/or assistance with raising capital (Adkins D 2001). Thus the first business incubator was born.

Incubation programs sprang up late in the 1970s, mostly of mixed-use types. Until the 1980s only a small number of incubators considered incubation to be an industry (National Business 1997). National Business Incubation Association is a leading organisation in business incubation for over fifty years in USA. According to NBIA, there are more than 7,000 incubation programs worldwide (National Business 2014).

In Europe, one of the first incubators was set up by the United Kingdom in 1975, when ‘British Steel’ formed a subsidiary called the ‘British Steel Industry (BSI)’ to create jobs in steel closure areas. Both in the USA and in Europe, step by step, the business incubation concept evolved. The business incubator first became an instrument to promote a more diversified base for regional economies and later became a tool for improving regional competitiveness by fostering the emergence of technology-based firms. That is the reason why they began to seek closer contacts with higher educational and public research institutions. In Germany for instance, the University of Berlin established the first incubator in 1983 and aimed at facilitating the transfer of research output to industry in need. France followed in 1985 creating an incubator within the ‘Sofia-Antipolis’ technology park. Incubators whose primary goal is to focus on the narrowness of regional development gaps are called economic development incubators; incubators that focus on the development of technology-oriented firms are called technology incubators. In the 1990s, the trend was to develop technology incubators
around specific industrial and technological clusters such as biotechnology, information technology, environmental technology, or, speech technology (Aernoudt 2004).

It is expected that the number will continue to grow as other nations too are considering business incubation as a tool to stimulate economic growth (Monkman 2010). There are more than 1000 incubators in Asia (European Commission 2002); (Lalkaka & Bishop 1995); (Lalkaka 2003). In Asia, China, Korea, Japan, Taiwan have maximum number of business incubators and in India there is a spurt in the number of business incubators during the last five years.

2.2 DEFINITION OF BUSINESS INCUBATION

NBIA defines the incubation as a process to accelerate the success of start-up companies by guiding entrepreneurs with a matrix of resources and services (National Business 2014). These services are guided by BI management and network contacts for the incubatee.

The critical outcomes from the definition of incubators include: 1) the guidance of management, 2) assistance in technical activity, 3) advisor for young start-up companies, 4) access to rental space, 5) common business services and equipment, and 6) guidance to raise funding and 7) technology support required by the start-up companies.

Business incubation is defined as a mixture of business development processes, infrastructure and people, to support the growth of start-up companies by supporting them through a process of development (UKBI 2014).
According to infoDev (2009), business incubation is a public and/or private, entrepreneurial, economic and social development process designed to nurture businesses from idea generation to starting-up companies and, through a comprehensive business support program, help them establish and accelerate their growth and success. It provides a simpler but comprehensive definition of business incubator stating that the business incubator is a physical space or facility that accommodates a business incubation process.

### 2.3 INCUBATOR TYPES AND SERVICES

There is no standard model or archetype of business incubators. Real estate or space based incubators provide physical space, shared office amenities, and support in reducing start-up costs. Some other incubators focus on providing managerial and entrepreneurial resources. Essentially incubators would mean different and portray different set of attributes in different economies based on their associated needs. However, one common goal that might bind all the incubation programs together would be producing successful incubatee clients or facilitating success of incubatee clients. This essentially translates the outcome of financially viable incubatee entity that can manage on its own when it leaves the incubator in two to three years’ time. The associated corollary principle could be providing one stop or single window solutions at an affordable or low cost.

Table 2.1 illustrates classification of Business incubators based on their philosophy, objectives and focus sectors.
Table 2.1 Classification of Business Incubators (Aernoudt 2004)

<table>
<thead>
<tr>
<th>BI type</th>
<th>Main philosophy dealt with</th>
<th>Main objective</th>
<th>Secondary objective</th>
<th>Sectors involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed incubators</td>
<td>Business gap</td>
<td>Create start-ups</td>
<td>Employment creation</td>
<td>All sectors</td>
</tr>
<tr>
<td>Economic development incubators</td>
<td>Regional or local disparity gap</td>
<td>Regional development</td>
<td>Business creation</td>
<td>All sectors</td>
</tr>
<tr>
<td>Technology Incubators</td>
<td>Entrepreneurial gap</td>
<td>Create Entrepreneurship</td>
<td>Stimulate innovation, technology start-ups, and graduates</td>
<td>Focus on technology, recently targeted, e.g. IT, Biotechnology</td>
</tr>
<tr>
<td>Social incubators sector</td>
<td>Social gap</td>
<td>Integration of social categories</td>
<td>Employment creation</td>
<td>Non profit</td>
</tr>
<tr>
<td>Basic research Incubators</td>
<td>Discovery gap</td>
<td>Blue-sky research</td>
<td>Spin-offs</td>
<td>High tech</td>
</tr>
</tbody>
</table>

A summary of goals, services and types comprehensively depicted in Table 2.2.

Table 2.2 Summary of goals, services and types (Al-Mubarak 2011)

<table>
<thead>
<tr>
<th>Incubator Types</th>
<th>Technology incubator, incubation of services, mixed – use type, manufacturing incubation, web related business incubation, incubation of community and revitalisation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubators Goals</td>
<td>Jobs Creation in community, entrepreneurial climate, community's and value it attributes to entrepreneurship, provide the business in the community, building/accelerating growth of local industry, diversifying local economies, encouraging minority or women entrepreneurship, opportunities of analysis of the spin-in/spin-out business, commercialising technologies to support the entrepreneurs in the community, generating complementary benefits for the sponsoring organisation, revitalising distressed neighbourhood, and transfer the people to the work.</td>
</tr>
</tbody>
</table>
Table 2.2 (Continued)

<table>
<thead>
<tr>
<th>Incubators Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support the business activities of network with other programs, advice to the market, access to internet, services such as shared office and administrative support, easy access to bank loan, linkage to higher education resources, help with accounting/financial management, access to loan funds, access to loan guarantee programs, linkages to strategic partners, help with presentation skills, shadow advisory boards/mentors, human resources/personal development/training, linkages to angel or venture capital investor, help with business etiquette, comprehensive business training program, assistance with e-commerce, specialised equipment/facilities, business management process/customer/assessment services/inventory/management, federal procurement assistance, commercialising technology, management team identification, assistance with manufacturing practices, process and technology, general legal services, international trade assistance, and IPR.</td>
</tr>
</tbody>
</table>

2.3.1 Business Incubation Services

This section describes various services generally provided by BIs to their incubatee start-up clients:

2.3.1.1 Access to infrastructure

Business incubators provide various types of infrastructural support to incubatees. Common ones among them are office space, shared office resources such as communication infrastructure, meeting rooms, conference facilities, copier, and secretarial services. The technology based business incubators, in addition to the above services, provide specialised technology infrastructure access for product development and testing. Such support would be crucial for young start-up firms; otherwise it would be difficult for them to get these facilities in a single location.
2.3.1.2 Access to mentoring

Mentoring helps start-up firms to validate their idea, business plan and business model through advices from experienced mentors from both technology and business domains. Incubators generally have a pool of mentors and they assist the incubatees to match with right type of mentors. When daunted with challenges, trust relation built with mentors helps the start-ups to take appropriate course corrections. Furthermore, mentoring helps incubatees to tap right opportunities in terms of business development, fund raising and even for identifying right talent.

2.3.1.3 Access to funding

Availability of funding and timing of funding help start-ups to stay focused on their technology/product/market goals. Funding is an absolute necessity to raise the required resources. While founders’ investment or early revenues (boot strapping) is helpful in the initial days, the business has to raise funds in order to stay afloat until attaining breakeven and chartering a growth process. Many incubators provide seed funding assistance, provide linkages to raise grants from Government program, facilitate access to bank loans, angel investments and even early stage venture capital funding.

2.3.1.4 Access to talent

Start-ups usually find it difficult to attract talent either due to their inability to pay well or due to lack of reputation that a prospective employee might expect. BIs use their network and connections to help their incubatees find appropriate talent. Academic institution based incubators have access to their student pool and alumni network. While experienced employees are reached through the BI network, the campus environment provides an
opportunity for the incubatees (located in an academic institution based incubator) to hire students as interns/ project trainees / part time employees.

2.3.1.5 Access to markets

Due to paucity of time and money, start-ups generally do not undertake market research. They build a prototype, test it and launch an early version. If the same is not accepted, they iterate it further and re-introduce. Essentially, the iterative efforts and failure in those efforts become their market research. These efforts are called pivoting in start-up parlance. Pivoting continues until the start-ups succeed and grow or until depletion of their resources and energy. Hence, the access to market support from the incubator would be crucial for the incubatee firms in order to validate the products, get initial set of customers and to plan their sales & revenue growth strategy.

2.3.1.6 Access to legal /accounting/ intellectual property rights and other allied business services

Start-ups initially require legal support for incorporating the venture and valuation/term sheet related advice is needed while raising funds from angel or venture capital firms. They are in need of IPR protection too for safeguarding their innovation/copyrights/brand/logo. Situations such as issue of stocks to key employees / stock divesting when raising funds require proper due diligence. Some incubators provide in house support through a set of professionals or provide access to professionals in their network. Lack of proper legal/IPR strategy would be detrimental to the interests of the incubatee firm. Occasionally, the start-ups also might require accounting, secretarial or business consulting service.
The business incubator services could be broadly grouped into the following:

i. **Access to knowledge and infrastructure**

   This covers a wide array of services such as office space, laboratory space, hardware and software support, meeting / conference rooms, communication facilities, human resources, expert consultation and other such services. As far as the start-ups are concerned such services are vital for reducing the cost of starting up, economies of scale and visibility due to the incubators’ brand.

ii. **Access to networks**

   Typically such services revolve around mentoring, coaching, getting services from legal, accounting and other service providers in the business incubators’ network. The start-ups derive value through learning, exchanging ideas, moral support, partnerships and new avenues of associations. Such services help them to save time and money as the non-core activities are taken care.

iii. **Access to market and finance**

   Such services include business development facilitation, help to acquire first set of clients, market research, market entry and validation advice, introduction to financial agencies such as angels, venture capital firms, banks, facilitation to raise government and non-governmental grants, seed funding from the incubator and assistance to mergers and acquisitions. These services help start-ups to overcome credibility gaps by leveraging the
strength and reputation of the incubator for raising finance and to gain acceptance from customers.

Start-ups face several risks during the formative stages of business creation (especially during the first 3 years). The risks could be technology risks, market risks, business management risks and these risks result in high mortality rates. According to USA’s department of ‘Small Business Administration (SBA)’, only around 44% start-up ventures survive after two years. BIs by virtue of their service offerings mitigate these risks and help start-up ventures to survive and grow beyond this valley of death popularly known as crossing the chasm.

2.4 SUCCESS OF INCUBATION OUTCOMES

Success of business incubation or a business incubator could be captured in many different ways depending on the objectives with which the promoters have set up the incubator. However, it is widely accepted that the ability of incubator in enabling success of incubatee companies could be considered as success of any incubation program.

Performance of an incubator should be measured essentially by the survival and growth of the incubatees (Lalkaka & Bishop 1995). However, according to Sherman & Chappell (1998) ‘measuring the outcomes are not easily quantifiable as incubators set different goals due to varied needs of different incubatees and measuring becomes very difficult owing to the complexities’. They add that incubators pursue different goals and objectives depending on their source of funding and additionally the impact of incubation interventions are not immediately visible.
The following depict the success qualifiers of incubatee firms:

i. **Meeting product / service objectives**

   Normally incubatees join an incubator in the idea stage. The incubation objectives cover various stages such as, idea to proof of concept, developing a working prototype (Minimum Viable Product - MVP) and culminating with development of a commercial product. Every so often, the task involves an innovative idea getting developed into full pledged product through technology development activities. Similarly for a service firm the tasks are service design, service development, service testing and launch.

ii. **Meeting financial objectives**

   Financial objectives deal with the incubatee firms’ ability to get the sales process rolling out and generating revenue and cash flows. This helps the firm to stabilise their operations, reduce inflow of external funding by constantly increasing the revenue and profits.

iii. **Acquiring funding**

   Fund raising objectives are connected with the efforts put in by the incubatee firm to raise the required finances in order to acquire other resources. Typically this would cover seed funding, innovation grants from Government or ‘Non- Government’ agencies, angel investments, bank loans, crowd funding and early stage venture capital investments.

iv. **Growth in team size**

   For firms with an agenda to create jobs, the number of jobs generated is a benchmark of success. Ability to sustain the number of employees is an indicator of financial health of the firm too. Success
indicators for service intensive firms could be availability of relevant skills and ability to ramp up workforce to deal with the new order inflows.

v. Market acceptance

The ultimate success of a firm could be defined by its ability to get customers, make them buy the product/service; sustain the association by increasing the volume of orders and growing the business by acquiring new customers.

vi. Impact creation

Beyond the commercial success and revenues, socially mandated ventures have an additional responsibility of creating impact in terms of their set social objectives. Some of the impact factors could be skill development, uplifting weaker sections, and clean energy adoption.

vii. Survival and growth

While incubation provides a protected ambience and cost effective way of starting a business, the sustainability of the venture beyond the incubation tenure could be a measure of success (of endurance).

2.5 JOURNEY OF INDIAN INCUBATION

In its report ‘Entrepreneurship in India’, ‘National Knowledge Commission (NKC), discusses about the entrepreneurship pyramid in India (in terms of sectors and number of people engaged and the figure given below depicts four levels in a pyramid depicted in Figure 2.1.
Figure 2.1 Entrepreneurship pyramid

Level 1 relates to agriculture and other activities involving crop production, plantation, forestry, livestock, fishing, mining and quarrying. Level 2 is associated with trading services covering wholesale and retail trade; hotels and restaurants. Level 3 comprises of old economy or traditional sectors; manufacturing, electricity, gas and water supply. Level 4 deals with emerging sectors in the knowledge intensive sectors such as ICT, finance, insurance and business services, construction, community, social & personal services, supply chain, transport-storage-communication etc..

Levels 2 and 3 are connected to traditional areas of entrepreneurship and level 4 is associated with emerging and modern sectors of entrepreneurship having high growth rate. Increased rate of access to higher education, research and development infrastructure expansion, creation of knowledge networks, exposure to international trade and business, experience gained through working in multinational firms thereby having exposure to cutting edge technological areas have motivated many of the qualified youngsters to attempt start-ups in the level 4 areas. While the risks are high, the associated rewards are very high too. The dreams and aspirations of these
innovators / entrepreneurs have been propelled by many home grown successes of firms that have become billion dollar entities in less than 10 years of time. Additionally, the NKC report has captured a new trend of growth in number of new companies registered in the level 4. This is at a much faster rate than the other levels from the start of this millennium. This NKC study recommends that incubation has to be made as a core business proposition to trigger entrepreneurship and presses on the need to develop feasible business models, financial and commercialisation aspects of incubation (National Knowledge 2008).

In its report, ‘Fuelling Entrepreneurship’, NSTEDB (National Science 2014) presents the gathering momentum for multidimensional incubation services in India. The evolution of Indian incubators from space based basic low cost service providers in the mid-eighties to modern incubators on par with contemporary systems elsewhere in the world is captured well in the Figure 2.2.

![Figure 2.2 Build-up of incubation momentum in India (National Science 2014)](image)
The Ministry of Science & Technology, Government of India initiated its first set of business incubation programs as ‘Science and Technology Entrepreneurs Park (STEP)’ program under NSTEDB in mid-eighties. Eighteen STEPs were promoted across India from 1984 to 2000. The philosophy of STEPs heavily focused on translating research knowledge from the campuses into technology and commercialising the same. The focus of incubation services was heavily anchored in services such as training, space and low cost common facilities. The STEPs promoted 788 ventures and generated employment for 5000 persons. From the year 2000, NSTEDB started the next generation business incubation programs as Technology Business Incubators (TBIs). This was considered as an alternate mechanism in order to accelerate high technology venture creation.

Main objectives of TBIs as envisaged by NSTEDB (National Science 2009a):

i. Creating technology based new enterprises

ii. Creating value added jobs and services

iii. Facilitating transfer of technology

iv. Fostering the entrepreneurial spirit

v. Speedy commercialisation of R & D output

vi. Specialised services to SMEs

From 1999 to 2014, over sixty business incubators were set up by NSTEDB. A TBI could be set up in any technological area after a feasibility study. TBIs furthered the cause of incubation by providing augmented services such as market survey/ marketing assistance, business planning and coaching, technical assistance, assistance in legal and regulatory approvals,
mentoring, arranging funding, IPR services, infrastructure and product develop facility from host academic institute, internet and communication facilities (National Science 2009a).

Many of the TBIs in the last 10 years have built good amount of networks both nationally and internationally. Some of the TBIs have worked with infoDev, an arm of ‘The World Bank Group’, ‘United Nations Industrial Development Organisation (UNIDO)’ and ‘European Union (EU)’ projects. These projects focused on providing innovation and entrepreneurship capacity building and international linkages to incubatees. Furthermore, TBIs have kick-started value added incubation services such as ‘in house seed funds’, ‘access to angel and venture capital funding’ and access to market support.

Since TBIs have a business model of running their operations either in a self-sufficiency basis or by generating surplus, they are in a position to provide mentoring with greater conviction built in. NSTEDB has provided opportunity for many of the incubation managers to have international exposure through international training and exposure visits to reputed incubators in USA, Europe and other locations.

From the year 2008, a number of incubators are providing soft landing support for international start-ups, co-incubation for cross cultural start-ups, special interventions targeting sectors namely agriculture, design, herbal products and emerging fields such as Nano technology apart from the regular services.

According to NSTEDB, the business incubation outcomes reveal that during 2012-2013, 32,000 jobs have been provided by all the incubatee and graduated companies and during the same period Rs.15000 million (~$250 million) was the combined turnover of incubatee and graduated companies (National Science 2014).
2.6 EXAMPLES OF EARLY OPEN INNOVATION ATTEMPTS BY INDIAN INCUBATION SYSTEMS

2.6.1 Intel- DST- APIN- Asia Pacific Challenge

For over 3 years (2009-12), NSTEDB has partnered with Intel and ‘Asia Pacific Incubation Network (APIN)’ to organise the ‘Intel- DST- APIN- Asia Pacific challenge’. This competition targeted social innovations in the high technology domain, having high growth potential in certain thematic areas across 12 countries from Asia-Pacific region. One of the main objectives of this initiative was to showcase technology innovations to potential investors and industries for strategic partnerships. Another objective was to create a platform for the incubators and technology start-ups for soft landing of ventures in the Asia-Pacific region. This could be considered as one of the early attempts to link industries and start-ups through a centrally managed program. During the program, every year, a number of innovative start-ups from incubators across the 12 partner countries were showcased to potential industry partners and investors.

2.6.2 DST-Federation of Indian Chamber of Commerce and Industries (FICCI)-Lockheed Martin-India Innovation Growth Program (IIGP)

IIGP was launched by NSTEDB in association with FICCI, Lockheed Martin Corporation, ‘Indo –US Science & Technology Forum (IUSSTF) and the IC2 Institute of University of Texas at Austin, Texas, USA. IIGP has been carried out successfully during the last 5 years. The objectives of the programme are:

i. To assist Indian innovators accelerate their technologies into the global markets
ii. To help innovators assess the right scientific and commercial value of their innovation

iii. To get right product to the right market with the right partner at the right time

While the incubatees from various Indian incubators are eligible to take part in this programme, IIGP accepts innovations from academia, researchers and/or individual firms too. So far, the program has received over 3000 applications, advanced training in various aspects of technology commercialisation was provided to 220 innovators, and over 250 business engagement agreements signed connecting innovators to industry partners, venture funds, angel funds as well as various Government funding sources. During 2010-12 period, revenues exceeding Rs.15,000 million (~ USD 250 million) was generated by participants and their companies. Even though incubators-incubatees were not the sole beneficiaries of this program, the lessons and experience from this initiative are very valuable for the incubator fraternity to consider OI as a tool to enhance / augment access to market support.

2.6.3 DST- Economic Times-IIMA Power of Ideas

During the last 4 years, ‘Power of Ideas’ is being conducted annually by the ‘Economic Times (a business daily newspaper)’ with DST and ‘Center for Innovation Incubation and Entrepreneurship (CIIE)’- an incubator promoted jointly by NSTEDB and ‘Indian Institute of Management(IIM)’, Ahmedabad. The main objective of this programme is to create a culture of innovation in the country by touching more lives. The programme so far has received over 16,000 ideas, 850 entrepreneurs were provided mentoring support and over 100 start-ups were given intensive mentoring with the support of CIIE.
2.6.4 Intel-DST- NSRCEL- Next Big Idea

NSTEDB partnered with Intel and NSRCEL-an incubator promoted by IIM, Bangalore to organise the Intel-DST-Next big idea, a country wide ideation competition.

Main objectives of this programme are:

i. To encourage innovation

ii. To create a structure and process for business plan competition among leading academic institutions across the country so that the ideas winning such competitions are converted into real business ventures

iii. To create a platform where any individual or team can post their innovative ideas and seek mentoring, access to incubation and angel funds to help them create a real business.

This event showcases areas with the greatest potential for creating an impact in the society through commercialisation of new and truly innovative technologies. In the past, winning teams were provided incubation support, seed fund support and opportunity to participate in the Intel global challenge at University of California, Berkeley, USA.

From all the above programs, it is clear that NSTEDB has been piloting many models of OI initiatives through partnerships with academia, incubators, industry, financial institutions and even media. Learning from such programs would be valuable for incubators or incubator networks for considering similar OI initiatives either individually or collectively.