

**Business Incubation: A Review of Research Orientations,
Impacts and Determinants of Success**

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Abstract

The need and importance of Business Incubation is amply emphasized in the recently drafted National Entrepreneurship Policy for India. Business Incubators have been widely promoted and supported in the developed countries. A lot of research has been conducted on various aspects of business incubation in other countries but research on business incubation in the Indian context is in its nascent stage. The Purpose of this paper is to take stock of existing publications and identify the research gaps by systematically reviewing the literature on business incubators and business incubation. The Paper reviews a range of research publications on Business Incubation published during 1980-2012, sourced from EBSCO and PROQUEST databases, which describe incubator configurations, incubator-incubation impacts, critical success factors for incubation, incubator development, and incubatee development. It aims to provide an account of important perspectives from the literature which are likely to be of relevance to researchers, incubator managers and incubatee start-ups. The observations from of this paper can provide lessons for the private and government promoters of business incubation in India for the adoption of suitable and relevant models of business incubation. The paper also identifies possible areas of future study.

KEY WORDS: Business Incubation, Incubation Research Orientations, Incubation Impacts, Critical Success Factors for Incubators.

Introduction

Business incubator is an interface between a business idea and the real time market. It acts as a facilitator for aspiring entrepreneurs by providing them with easy availability of capital,

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infrastructure and expertise. Business incubators aim to promote creation of enterprises and inculcate entrepreneurship by utilizing the ability and creativity of the incubatee. They are now recognised in both developed and developing countries as important instruments for promoting entrepreneurship development and technological innovation at the small and medium enterprise level. Business Incubators provide services to the entrepreneurs on a 'one stop' basis and enable them to reduce their costs by sharing the facilities. Business incubation is especially important to fostering young firms through the most vulnerable start-up phase (Kuratko and LaFollette, 1986; Adegbite, 2001; Aernoudt, 2002; and Chandra *et al.*, 2007).

“Business incubation is a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and offered both in the business incubator and through its network of contacts. A business incubator’s main goal is to produce successful firms that will leave the program financially viable and freestanding.”

- (National Business Incubation Association, 2009)

There is a need to set up a lot of business incubation centres in India. The government of India is in the process of drafting the policies to encourage the Business Incubators in India. By Promoting Business Incubators in India, the problem of unemployment can be solved to a great extent as job seekers are then likely to become the job providers as entrepreneurs. The following review of literature presents a summary of research findings, from other parts of the world, on various issues which may be helpful in drafting the policies regarding business incubation in particular and entrepreneurship in general.

Review of Literature

Research suggests that there is no country that has high levels of entrepreneurship and low levels of economic growth (Reynolds *et al.*, 2002).

It is generally accepted that the first incubator was established as the Batavia Industrial Center in 1959 at Batavia, New York. In the 1960s and 1970s incubation programs diffused slowly in US, and typically as government sponsored responses to the need for urban/Midwestern economic revitalization. In the 1970s interest in the incubator-incubation

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concept was further catalyzed through the operation of the National Science Foundation's Innovation Centres Program, an effort to stimulate and institutionalize best practices in the processes of evaluating and commercializing selected technological inventions (Scheirer, 1985; Bowman-Upton *et al.*, 1989). In 1990, the media popularized a fantasy of business incubators as innovation hatcheries capable of incubating and taking public "infinitely scalable, dot-com e-business start-ups" less than a year after entering the incubator. This fantasy and the incubator incubation concept were largely abandoned and left for dead by the popular press after the collapse of the United States' stock market bubble. However, rumours of the demise of the incubator incubation concept are "greatly exaggerated". The media reached its negative conclusions regarding incubators-incubation while fixated on for profit incubators, a relatively small segment of the total incubator population (Hackett and Dilts, 2004_b). Currently, The United States has the largest number of business incubator programs in the world. In many ways the U.S. has been a pioneer in this industry and the growth has been rapid from 12 in the 1980s to about 1,250 in the 2012 (NBIA, 2012).

China has a well-developed incubation market space with the government playing a predominant role in the business of incubation by channelling resources to accord with the government mandate of high technology led economic growth. China is second to USA in number of Incubators. In China, the first business incubator was set up in Wuhan in 1987, with funding from the government (Chandra and Chao, 2011). The growth of business incubators in China occurred on a national scale, fuelled primarily by financial support from the Chinese Government. The Chinese Government started the Torch Program in 1990, a part of the Ministry of Science and Technology which invested heavily in Incubators. The Government has set aside 50 million Yuan (U. S. \$6 million) in annual funding for incubator construction. By the end of 2003, China had over 500 incubators, which provided a raft of services to incubatees ranging from real estate, financing, marketing, human resource, training and networking to advising on public policy (Chandra and Fealey, 2009). By 2006, the Chinese government's investments in these business incubators had resulted in 534 incubators nationwide. The total number of incubatee firms housed in incubators as of 2006 was 39,491 (which account for one third of all high-tech SMEs in China), and the total number of 15,815 graduate firms (out of these, 50 are listed firms). Patents applied by these firms totalled 17,225 (out of which 10,926 have been approved). Economic contributions include a total revenue of \$1.6 trillion Yuan (USD \$235 billion) and total job creation of 7,

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10,000. The incubators in China have now evolved from first to second generation, moving from comprehensive (open to a variety of high-tech incubatees such as software, bio pharmaceuticals, and new materials) to a more specialized focus (concentrating on one of the high-tech industries) (Chandra and Fealey, 2009).

Business Incubator Configurations

Business incubators in the United States were funded primarily by government grants and university / corporate support along with rental and consulting income (Chandra and Fealey, 2009). Business incubators typically utilize a combination of three types of revenue models. The first revenue model incorporates the revenue from rental income from tenants and other revenues derived from client fees for consulting and other services. This “landlord” model can be financially self sufficient, given “free” buildings and minimum economies of scale. The second revenue model involves the incubator taking an equity position in its more promising client firms and has the potential to generate revenues from sharing in client success or royalty agreements on gross sales and brokerage fees on raising finance. This method however requires substantial initial investment and a great deal of patience, as it may take up to 10 years to generate revenues. The third, and most common, method is to rely on an ongoing sponsor funding, such as the university, government at the federal / state / local levels, of private foundation or industry support (Lalkaka, 2011; Chandra and Silva, 2012). In United States, the most common form of incubator model found is University Based Incubators. The strategic focus of the university based business incubator is technology transfer and commercialization; primarily of research originating from university faculty, as well as local high technology businesses (Chandra and Chao, 2011). Incubators around the world are either affiliated to a university/government or to a local economic development agency that invests public/ private resources into incubation to support a new venture at the earliest and most vulnerable stage of its life cycle (Chandra and Chao, 2011). The incubators in China were, by and large, established and funded by the government. The government viewed business incubators as a strategic tool for China's transition to a high technology-driven market economy and hence was willing to invest large amounts of resources into these crucibles of entrepreneurship (Harwitt, 2002). The Chinese Government has set aside 50 million Yuan (U. S. \$6 million) in annual funding for incubator construction through the Torch Program, a part of the Ministry of Science and Technology (MoST). The Torch Center

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predicts that the total number of STBIs will reach 1,500 by 2015 and that they will nurture more than 100,000 technology-oriented start-up firms (Zhang and Sonobe, 2011). Purely private-funded incubators are really rare in China at present (Chandra *et al.*, 2007).

In Brazil, incubators were generally linked to universities and funded by plural government and non-government sources. The programs such as the PNI (National Incubation Support Program) are designed to support new incubator creation and the expansion of existing ones. The PNI program is supported by a coalition of government, industry and incubator associations (Chandra and Fealey, 2009).

In Nigeria, there are two types of Incubators, Industrial Business Incubator and Technology Business Incubator. The Federal Ministry of Industry and Federal Ministry of science and technology, in Nigeria is already committed to a programme of establishing several industrial incubators and technology incubators all over the country in order to stimulate the emergence of an increasing number of small and medium scale manufacturing establishments able to utilise the abundant supply of human and material resources available in the country (Adegbite, 2001)

Critical Success Factors

Critical Success Factors are those dimensions of firm's operations that are vital to its success (Rockart 1979; Dickinson *et al.*, 1984; Lee and Osteryoung, 2004). Focus on Critical Success Factors (CSFs) reduces failures once firms join a business incubator. These factors vary across industries, product lines and other dimensions of strategic relevance (Lumpkin and Ireland, 1988). Chung (1987) notes that "Critical success factors are those few things that must go well to ensure success for a manager or an organization, and therefore, they represent those managerial or enterprise areas that must be given special and continual attention to bring about high performance".

Linkage with universities has been recognized as a major success factor in studies on the performance of incubation programme (Lai *et al.*, 2005; Hongyi *et al.*, 2007). However, Cooper (1985) is of the opinion that the role of universities in the incubation process appeared to be less direct than is often assumed (Hongyi *et al.*, 2007). Zhang and Sonobe (2011) concluded that there are no significant differences between university-based incubators and government-established incubators in the way in which their resource inputs contribute to incubation performance.

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Another important factor accounting for the success of incubation programme is the commitment and support of government. Under the shelter of government, with various incentives like tax exemptions, fund reservoirs, and free rental, etc., new technological firms can commence, survive and grow. This is often the case in the Asia-Pacific region, such as Taiwan (Hongyi *et al.*, 2007). The entrepreneur's experience is considered very important for technological start ups. The "Market" and "Product" are the two most important factors for the survival and development of any incubatee (Hongyi *et al.*, 2007). Tyebjee and Bruno (1984) proposed the importance of several market factors to a firm's success, including the current size and growth rate of the firm's target market and the uniqueness and quality of the firm's access to its customers. Evidence exists suggesting that certain managerial characteristics and/or skills may be critical to a small business firm's success (Lumpkin and Ireland, 1988). Ballas and Hollas (1980) identified several personal characteristics of the successful entrepreneur—creativity, aggressiveness or persistence, and risk acceptance (as indicated by personal investment)—that may also denote critical success factors. The number of successful graduates will heavily depend on whether incubation managers can select ventures with high potential as tenant firms and on whether the managers can provide high-quality training and assistance to tenant firms. Business Incubator with highly educated incubation managers will have an advantage in inviting competent lecturers to their programs and introducing their tenant firms to potential customers or sponsors (Zhang and Sonobe, 2011).

Park *et al.* (1999) suggested the following strategies to operate the technology business incubator's (TBI) efficiently: (1) A unified operating center to solve problems (2) An integrated supporting center to collect and to distribute information to each TBI through computer networking; (3) Consideration for cultural properties and kinds of business for establishment and operation; and (4) The integrated TBI supporting center to include a capital network system for efficient fundraising and management. Lumpkin and Ireland (1988) noted that 15% of incubators do not screen their applicants. This is a positive finding, for it suggests those who manage incubators use some kind of methodology to choose firms that are to be extended a membership invitation. The critical success factors examined by these managers had both a market and personal characteristics orientation. This suggests an interest in matching a firm's external opportunities (that is, the market factors) with its internal capabilities (those represented by the personal characteristics factors). This type of matching

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process is highly consistent with the dictates of effective strategic management practices. Further, almost 70% perform a thorough screening. However, the emphasis does differ for different groups of incubators. The incubators seek a mix of new and experienced firms: (1) the more established firms pay a higher rent, which may be used to subsidize losses incurred from the below-market rents typically offered to start-up firms; and (2) managers of the larger firms are able to assist their counterparts in the smaller, new ventures (Lumpkin and Ireland, 1988). Cooper (1984) has noted that some incubators exclude retail firms, others prefer service firms to the exclusion of manufacturing, while still others specialize in attracting "high tech" firms. The type of firms either excluded or "specialized in" will likely be related to the CSFs evaluated by incubator managers (Lumpkin and Ireland, 1988).

Incubatee Development

The incubator adds value to the incubatee by making available a range of high quality monitoring and business consulting services inside the business incubator (Temali and Campbell, 1984; Allen and Rahman, 1985; Brooks, 1986; Smilor, 1987; Udell, 1990; Mian, 1997; Sherman and Chappell, 1998; and Hansen *et al.*, 2000). Monitoring and the provision of real time feedback help contain downside risk to the options by preventing them from making stupid but costly and potentially terminal business mistakes (Hackett and Dilts, 2004a). Incubators provide their clients with basic infrastructural support, such as shared office facilities and workshops, as well as business assistance services. Incubators also provide technology-related support including technology transfer programs to their tenant firms (Abetti 2004). Such value-adding support is expected to enhance the performance of the tenant firms and contribute to their successful graduation (Zhang and Sonobe, 2011). (Arlottoa *et al.*, 2011) conclude that that the access to resources and services by incubators is a determinant to set up a business for a lot of entrepreneurs. In fact, 74% of entrepreneurs came to incubation for the proposed services. Business incubators also provide training and education services as a way to strengthen the capacity and ability of resident enterprises for long-term survival. These services may take the form of workshops, seminars, conferences and short courses. Much of the training is free-of-charge or subsidized by the management of the incubator (Xu, 2010). Apart from providing basic services and resources to the fledgling venture, the incubator plays a critical networking role in many cases by linking talent, technology and capital to accelerate the development of new firms (Smilor and Gill, 1986). Organized networking or preferential access to a network of companies was identified as a

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significant differentiating factor that distinguished incubators from those that merely provided office space and basic services (Hansen *et al.*, 2000). The first generation of incubators in China emphasized basic, physical infrastructure services and operated a 'landlord' model of incubation, where they provided incubatees government subsidized, low cost building space and related services. In the second phase of incubator development, the service emphasis appears to be focusing more on higher, value added services, such as consulting, networking and help with international market entry. Incubators in other parts of the world are in fact moving toward a similar model of emphasizing high value services. Financial services provided by incubators in the second phase of incubator development are far more sophisticated compared to the first phase. Second generation incubators that are run by a mixed group of sponsors are more likely to have enterprise-oriented managers interested in developing human capital. Second generation incubators that are run by a mixed group of sponsors are more likely to have enterprise-oriented managers interested in developing human capital (Chandra and Chao, 2011).

Incubator - Incubation Impacts

Hackett and Dilts (2004_a) explain Business Incubation Performance (BIP) in terms of incubatee growth and financial performance at the time of incubator exit. Operationally, there are five different mutually exclusive incubatee outcome states at the completion of the incubation process: (i) the incubatee is surviving and growing profitably; (ii) the incubatee is surviving and growing and is on a path toward profitability; (iii) the incubatee is surviving but is not growing and is not profitable or is only marginally profitable; (iv) incubatee operations were terminated while still in the incubator, but losses were minimized; (v) incubatee operations were terminated while still in the incubator, and the losses were large.

Business incubators are crucibles for entrepreneurship nurturing early stage ventures through 'valleys of death', when their growth and associated risk capital needs far outpace their capacity to generate self sustaining cash flow (Chandra and Chao, 2011). Business Incubator support reduces the 'liability of newness', meaning that the rate of firm survival during the incubation period as well as beyond graduation should be considerably high (Schwartz, 2009). The incubators can reduce the failure rate amongst new business start ups to below 10 percent over a three year period, as compared with 60 to 80 per cent for small business generally (Adegbite, 2001). The closure rate of firms in Germany during the incubation

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period is less than 10%, which seems quite satisfactory bearing in mind the failure rates of innovative start-ups in general (Schwartz, 2009). The simplest measure of incubatee success is “graduating” from the incubator upon overcoming resource gaps and developing sustaining business structures. The incubator success has been defined as a ratio expressed in the following terms- Number of Firms Exiting the Incubator: Number of firms discontinuing operations while still a tenant (Allen and Weinberg, 1988). Using data from the National Business Incubation Association (NBIA), Aernoudt (2004) differentiates post-graduation survival rates of three types of Business Incubators in the United States. The highest survival rate of graduates of 90% was for technology incubators, followed by 87% for the mixed incubator type. The lowest post-graduation survival rate of 86% was for economic development incubators. This incubator type is more focused on regional development. According to the Benchmarking Report of the European Commission, European Business Incubators have a slightly lower post graduation survival rate of about 84% (Schwartz, 2009). Incubators which help their incubatees fail quickly and cheaply are successful incubators because quick and cheap failures provide opportunities for entrepreneurial learning, firm recovery and repositioning (or later firm "reincarnation" in the event of terminal firm failure), an optimal allocation of incubator and incubatee owner resources, and an optimal injection of organizational population churn into the local economy (Hackett and Dilts, 2004_a). The start up businesses which participate in business incubation programs had a higher rate of survival compared to the average survival rate reported for all new business ventures reported by Small Business (Sherman, 1999). In China, incubators were viewed as a public good entity with a social mission, and tended to operate under a government mandate of economic development. In Brazil, there was a general lack of awareness of the world of incubation, in spite of the country's 400 incubators, whose primary goal was to foster a culture of entrepreneurship and to promote economic development (Chandra and Chao, 2011).

The incubator helps overcome market failures, promotes regional development and generates jobs (Reed, 1991; Hanadi and Busler, 2010). Hanadi and Busler (2012) concluded that the survival rate of companies inside the incubators is more than 90%, which reflects the sustainability of companies in the market and there is high rate of job creation from the companies such as: (1) the ratio between companies graduated to jobs created was 1:15, which means each graduated companies produce 15 jobs, (2) the ratio between companies in

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the incubator 547 to jobs created 15,751 was 1:28 indicating each company inside the incubator produced 28 jobs.

Business incubators have also an indirect job creation effect at a regional level e.g. (a) for every one incubator company job, a further 0.4 jobs will have been created indirectly via local supply chains that provide goods and services to the incubator; b) for every one incubator job, a further 1.5 jobs will have been created in the local and regional communities resulting from additional spending on local goods and services by people recruited by incubator companies (Lagos and Kutsikos, 2011).

Suggestions for Future Research

Future research can be focused on causal relationship between critical success factors and performance of incubated firms (Hongyi *et al.*, 2007). Empirical evidence is very limited concerning business closure after completion of the incubation process. What happens to the graduates after leaving the business incubator is still an unexplored area. Studies can be conducted to understand if and how business incubators really do contribute to the post-graduation success of incubator firms. Researchers can turn their focus to post-graduation issues to assess the survival rates of former tenants in general and exit dynamics after graduation in particular. Future studies should also investigate potential differences in survival and failure rates according to the type of incubators studied (e.g. post-graduation failure rates and the probability of survival may differ between diversified and more specialized incubators, between non-profit and profit-oriented incubators, or according to the service profile offered by the business incubator (Schwartz, 2009). There can be studies to determine if incubator managers differ in their screening practices and if so, in what manner (Lumpkin and Ireland, 1988). There can be studies to compare the expected and experienced value of incubation. Alternative incubation models could also emerge as a future topic of study (Xu, 2010).

References

- Abetti P A (2004), "Government-Supported Incubators in the Helsinki Region, Finland: Infrastructure, Results, and Best Practices", *Journal of Technology Transfer* Vol.29, No. 1, pp. 19–40, Available at: <http://ideas.repec.org/a/kap/jtecht/v29y2004i1p19-40.html> [Accessed on: November 15, 2012]
- Adegbite O (2001), "Business Incubators and Small Enterprise Development: The Nigerian Experience", *Small Business Economics*, Vol. 17, No. 3, pp. 157-166. Available at: <http://www.jstor.org/stable/40229178> [Accessed on September 24, 2012].

The Tenth Biennial Conference on Entrepreneurship, (EDI) Entrepreneurship Development Institute of India, Ahmadabad, February 20-22, 2013

- Aernoudt, R (2004), "Incubator: Tool for entrepreneurship? Small Business Economics", Vol. 23, pp. 127-135 as quoted in Schwartz M (2009), "Beyond incubation: an analysis of firm survival and exit dynamics in the post-graduation period", *Journal of Technology Transfer*, 34, pp. 403-421.
- Allen D N and M.L. Weinberg (1988), "State Investment in Business Incubators", *Public Administration Quarterly*, Vol. 12, No. 2, pp. 196-215 as quoted in Hackett S M and Dilts D M (2004), "A Real Options- Driven Theory of Business Incubation", *Journal of Technology Transfer*, Vol. 29, No.1, pp. 41-54.
- Allen D N and Rahman S (1985), "Small Business Incubators: A Positive Environment for Entrepreneurship", *Journal of Small Business Management*, Vol. 23, No.3, pp. 12-22.
- Arlotto J, Sahut M J and Teulon F (2011), "What is the Performance of Incubators? The point of view of coached entrepreneurs", *International Journal of Business*, Vol. 16, No.4, pp. 341-352.
- Ballas G C and Hollas D (1980), "The making of an entrepreneur", Englewood Cliffs, NJ: Prentice Hall, as quoted in Lumpkin, J.R. and R.D. Ireland (1988), "Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors", *American Journal of Small Business*, Vol. 12, No.4, pp. 59-81.
- Bowman U N, Seaman S L and Sexton D L (1989), "Innovation Evaluation Programs: Do they Help the Inventors?", *Journal of Small Business Management*, Vol. 27 (3), pp. 23-30, as quoted in Hackett S M and Dilts D M (2004), "A Systematic Review of Business Incubation Research", *Journal of Technology Transfer*, Vol. 29, pp. 55-82 .
- Brooks O J (1986), "Economic Development through Entrepreneurship: Incubators and the Incubation Process", *Economic Development Review*, Vol. 4, No.2, pp. 24-29.
- Chandra A, He W and Fealey T (2007), "Business Incubators in China: A Financial Perspective", *Asia Pacific Business Review*, Vol. 13, No. 1, pp.79-94.
- Chandra A and Fealey T (2009), "Business Incubation in the United States, China and Brazil: A Comparison of Role of Government, Incubator Funding and Financial Services", *International Journal of Entrepreneurship*, Vol. 13, pp. 67-86.
- Chandra A and Chao A C (2011), "Growth and Evolution of high technology business incubation in China", *Human Management System*, Vol. 30, pp. 55-69.
- Chandra A and Silva M A M (2012), " Business Incubation in Chile: Development, Financing and Financial Services", *Journal of Technology Management and Innovation*, Vol. 7, No. 2, pp. 1-12.
- Chung K H (1987) "*Management: Critical success factors*", Boston: Allyn and Bacon, as quoted in Lumpkin J R and Ireland R D (1988), "Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors", *American Journal of Small Business*, Vol.12 (4), pp. 59-81.
- Cooper A C (1984) "Contrasts in the Role of Incubator Organizations in the Founding of Growth Oriented Firms", as quoted in Lumpkin J R and Ireland R D (1988), "Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors", *American Journal of Small Business*, Vol. 12 , No. 4, pp. 59-81.
- Cooper A C (1985) "The Role of Incubator Organizations in the Founding of Growth Oriented Firms", *Journal of Business Venturing*, Vol. (1), pp. 75-86, as quoted in Hongyi S, Wenbin N and Leung J (2007), "Critical Success Factors for Technological Incubation: Case Study of Hong Kong Science and Technology Parks", *International Journal of Management*, Vol. 24, No. 2, pp. 346-363.
- Dickinson R A, Ferguson C R and Sitcar S (1984) "Critical Success Factors and Small Business" *American Journal of Small Business*, Vol. 49, as quoted in Lumpkin J R and Ireland R D (1988), "Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors", *American Journal of Small Business*, Vol.12, No. 4, pp. 59-81.
- Hackett S M and Dilts D M (2004_a), "A Real Options- Driven Theory of Business Incubation", *Journal of Technology Transfer*, Vol. 29, No. 1, pp. 41-54.
- Hackett S M and Dilts D M (2004_b), "A Systematic Review of Business Incubation Research", *Journal of Technology Transfer*, Vol. 29, pp. 55-82.

The Tenth Biennial Conference on Entrepreneurship, (EDI) Entrepreneurship Development Institute of India, Ahmadabad, February 20-22, 2013

- Hanadi A M M and Busler M (2010), "Business Incubator Models of the USA and UK: A Swot Analysis", *World Journal of Entrepreneurship, Management and Sustainable Development*, Vol. 6, No. 4, pp-335-354.
- Hanadi A M M and Busler M (2012), "Quantitative and Qualitative Approaches of Incubators as Value- Added: Best Practice Model", *The Journal of American Academy of Business, Cambridge*, Vol. 18, pp. 238-245.
- Hansen M T, Chesbrough H W, Nohria N, and Sull D N (2000), "Networked Incubators: Hot houses of the New Economy", *Harvard Business Review*, Vol. 78, No. 5, pp. 74–84.
- Harwitt E (2002), "High technology incubators: Fuel for China's new entrepreneurship?", *China Business Review*, 29(4), pp.26-29, as quoted in Chandra A and Fealey T (2009), "Business Incubation in the United States, China and Brazil: A Comparison of Role of Government, Incubator Funding and Financial Services", *International Journal of Entrepreneurship*, Vol. 13, pp. 67-86.
- Hongyi S, Wenbin N and Joseph L (2007), "Critical Success Factors for Technological Incubation: Case Study of Hong Kong Science and Technology Parks", *International Journal of Management*, Vol. 24, No. 2, pp. 346-363.
- Kuratko D F and LaFollette W R (1986) "Examining the small business incubator explosion", *Mid American Journal of Business*, Vol. 1, No. 2, pp. 29-34, as quoted in Chandra A, He W and Fealey T (2007), "Business Incubators in China: A Financial Perspective", *Asia Pacific Business Review*, Vol. 13, No. 1, pp.79–94.
- Lagos D and Kutsikos K (2011), "The Role of IT-Focused Business Incubators in Managing Regional Development and Innovation", *European Research Studies*, Vol. No. 14, No. 3, pp. 33-49.
- Lai H C, Shyu J Z (2005), "A Comparison of Innovation Capacity at Science Parks across the Taiwan Strait: the Case of Zhangjiang High-Tech Park and Hsinchu Sceince based Industrial Park Technovation", Vol. 25, pp. 805-813, as quoted in Hongyi S, Wenbin N and Leung J (2007), " Critical Success Factors for Technological Incubation: Case Study of Hong Kong Science and Technology Parks", *International Journal of Management*, Vol. 24, No. 2, pp. 346-363.
- Lalkaka R (2001), "Best Practices in Business Incubation: Lessons (yet to be) Learned", International Conference on Business Centres: Actors for Economic and Social Development. Brussels, November 14-15. http://www.bii.ge/eng/studies_and_Papers/LALKAKA_UK.pdf [Accessed on: March 18, 2012].
- Lee S S and Osteryoung J S (2004), "A Comparison of Critical Success Factors for Effective Operations of University Business Incubators in the United States and Korea", *Journal of Small Business Management*, Vol. 42, No. 4, pp. 418-426.
- Lewis D A (2002), "Does Technology Incubation Work? A Critical Review of Evidence", Athens, OH: National Business Incubation Association, as quoted in Hackett Sean M. and Dilts David M (2004), "A Systematic Review of Business Incubation Research", *Journal of Technology Transfer*, Vol. 29, pp. 55–82 .
- Lumpkin J R and Ireland R D (1988), "Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors", *American Journal of Small Business*, Vol. 12, No. 4, pp. 59–81.
- Mian S A (1996) "Assessing Value-added Contributions of University Technology Business Incubators to Tenant Firms" *Research Policy*, Vol. 25, No. 3, pp. 325-335, as quoted in Hongyi S, Wenbin N and Leung J (2007), " Critical Success Factors for Technological Incubation: Case Study of Hong Kong Science and Technology Parks", *International Journal of Management*, Vol. 24, No. 2, pp. 346-363
- Mian S A (1997), "Assessing and Managing the University Technology Business Incubator: An Integrative Framework", *Journal of Business Venturing*, Vol. 12, No. 4, pp. 251–285.
- NBIA (2009), "What is Business Incubation?" Available at : http://www.nbia.org/resource_library/what_is/ [Accessed on: September 10, 2012].
- NBIA (2012), "How Many Business Incubators are there?" Available at: http://www.nbia.org/resource_library/faq/index.php#3 [Accessed on: September 10, 2012].
- Park K, Shin G K, and Flan S T (1999). "A Study on the Present Conditions of Technology Business Incubator and its Efficient Operation ," *The Korean Small Business Review*, Vol.21, No.2, pp. 111-138, as quoted

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- in Lee S S and Osteryoung J S (2004), “ A Comparison of Critical Success Factors for Effective Operations of University Business Incubators in the United States and Korea”, *Journal of Small Business Management*, Vol. 42, No. 4, pp. 418-426.
- Reed D (1991), “Incubator Program: Factors in a Profile of Success”, *Journal of Business and Entrepreneurship*, Vol 3, pp. 61-72.
- Reynolds P D, Bygrave W D, Autio E, Cox L W and Hay M (2002), “Global Entrepreneurship Monitor”, *Executive Report*, as quoted in NBIA (2009), “What is Business Incubation?”, Available at : http://www.nbia.org/resource_library/what_is/ [Accessed on: September 10, 2012].
- Rockart J R (1979), “Chief Executives Define their own Data Needs”, *Harvard Business Review*, pp. 81-93, as quoted in Lumpkin J R and Ireland R D (1988), “Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors”, *American Journal of Small Business*, Vol.12, No. 4, pp. 59–81.
- Scheirer M A (1985), “Innovation and Enterprise: A Study of NSF’s Innovation Centers Program”, *Rockville, MD: Westat, Inc. and National Science Foundation*, as quoted in Hackett S M and Dilts D M (2004), “A Systematic Review of Business Incubation Research”, *Journal of Technology Transfer*, Vol. 29, pp. 55–82 .
- Schwartz M (2009), “Beyond Incubation: An Analysis of Firm Survival and Exit Dynamics in the Post-graduation Period”, *Journal of Technology Transfer*, Vol. 34, pp. 403-421.
- Sherman H and Chappell D S, (1998), “Methodological Challenges in Evaluating Business Incubator Outcomes”, *Economic Development Quarterly*, Vol.12, No.4, pp. 313-321.
- Sherman H D (1999), “Assessing the Intervention Effectiveness of Business Incubation Programs on New Business Start-up”, *Journal of Developmental Entrepreneurship*, Vol. 4, No.2, pp. 117-133.
- Smilor R W and Gill M D Jr. (1986), “The New Business Incubator: Linking Talent, Technology, Capital and Know How” *Lexington: Lexington Books*, as quoted in Chandra A, He W and Fealey T (2007), “Business Incubators in China: A Financial Perspective”, *Asia Pacific Business Review*, Vol. 13, No. 1, pp.79–94.
- Smilor R W (1987), “Managing the Incubator System: Critical Success Factors to Accelerate New Company Development”, *IEEE Transactions on Engineering Management*, Vol. 34, No. 4, pp. 146-156.
- Temali M and Campbell C (1984), “Business Incubator Profiles: A National Survey, Minneapolis: University of Minnesota”, Hubert H. Humphrey Institute of Public Affairs, as quoted in Hackett S M and Dilts D M (2004), “A Systematic Review of Business Incubation Research”, *Journal of Technology Transfer*, Vol. 29, pp. 55–82.
- Tyebjee T T and Bruno A V (1984) “A Model of Venture Capitalist Investment”, *Management Science*, pp. 1051-1066, as quoted in Lumpkin, J R and Ireland R D (1988), “Screening Practices of New Business Incubators: The Evaluation of Critical Success Factors”, *American Journal of Small Business*, Vol.12, No. 4, pp. 59–81.
- Udell G G, (1990), “Are Business Incubators Really Creating New Jobs by Creating New Business and New Products?” *Journal of Product Innovation Management*, Vol. 7, pp. 108-122.
- Xu L (2010), “Business Incubation in China Effectiveness and Perceived Contributions to Tenant Enterprises”, *Management Research Review*, Vol. 33, No.1, pp. 90-99. Available at: www.emeraldinsight.com/2040-8269.htm [Accessed on: Nov. 10, 2012]
- Zhang H and Sonobe T (2011), “Business Incubators in China: An Inquiry into the Variables Associated with Incubatee Success”, *The Open-Access, Open-Assessment E-Journal*, Vol. 5, Available at: <http://dx.doi.org/10.5018/economics-ejournal.ja.2011-7> [Accessed on: November 15, 2012]