

# ROLE AND IMPORTANCE OF TECHNICAL BUSINESS INCUBATORS IN INDIA: LITERATURE REVIEW

Mukul Jain<sup>1</sup>  
Dr. Chanchal Chawla<sup>2</sup>

Received: 05/09/2023, Review-1: 04/10/2023, Review-2: 08/11/2023, Accepted: 09/1/2024

## ABSTRACT

*Entrepreneurship is a well-defined discipline with autonomy that can operate independently and as a separate entity. It refers to the development of an entirely new organization. Entrepreneurship is a major factor and key to success for any individual who intends to develop an entirely novel and new business organization which is an entirely disciplined and independent entity. Business incubation is an economic development tool primarily designed to help create and grow new businesses in a community. Business Incubators help emerging businesses by providing various support services such as assistance in developing business and marketing plans, building management teams, obtaining capital, and access to a range of other more specialized professional services. Sherman and Chappell (1998). A Technology business incubator (TBI) is typically an organizational setup that promotes the setting up of an ecosystem to nurture various enterprises by providing support to them during their incubation period. The support may include providing state of the art facility for workspace, shared office services, and access to specialized equipment, labs, and workshops along with value-added services like fundraising, legal services, business planning, technical assistance, and networking support. The major aims and objectives of the technology business incubators are to produce profitable business enterprises that can create employment in the region. Technology Business Incubators: An Indian Perspective & Implementation Guidance Report by e-Centre for Internet and Society, India. This Review paper is focused on exploring various aspects which include the evolution and Functioning of Business Incubators in the Indian context, the role and support of government and non-government agencies involved in supporting and developing an ecosystem for business incubation, and exploration of various performance measures of Successful Business Incubator to foster Innovation, Entrepreneurship, and startup culture among the youth. This review will be useful in exploring various aspects of low performance of Business Incubators and will be useful in developing policies and strategies by the agencies involved to boost enterprise development locally and globally with the support of Technology Business Incubators.*

**Keywords:** Business Incubator, Innovation, Incubation, Entrepreneurship, Technology

## INTRODUCTION

The word “entrepreneur” is derived from the French word “entrepreneur” which means “to undertake.” During the starting phase of the 16th century, the persons who were

involved in the organization of military operations were observed as “entrepreneurs”. Schumpeter (1934) stated that “an entrepreneur is a person who carries out new combinations.

<sup>1</sup>Research Scholar, Teerthankar Mahaveer University, Moradabad, U.P., India  
[mukuljain2@gmail.com](mailto:mukuljain2@gmail.com), ORCID ID-0009-0005-1733-5661

<sup>2</sup> Professor, Teerthankar Mahaveer University, Moradabad, U.P., India  
[chanchal.management@tmu.ac.in](mailto:chanchal.management@tmu.ac.in), ORCID ID-0000-0002-5567-6564

He further stated that “The entrepreneur in any emerging country is a person who is capable of evolving innovative products within the emerging economy which includes a novel process of manufacturing which has not been tested and experienced in the related field of production, a process of offering a product with which consumers are not yet familiar, a novel form of raw material or new markets and the like Hoselitz (1960) believed that the innovator or entrepreneur purchases the products at a fixed price and after some innovation sells at a higher price.

### **Innovation and Entrepreneurship**

Entrepreneurship & innovation are vital in managing the international business environment which can enhance sustainability and competitiveness in business growth as a major economic phenomenon responsible for the wealth creation of nations. Crossan & Apaydin, (2010). The area of entrepreneurship, innovation-based education, and training is a challenge. These disciplines have complementarity and connection which in combination can yield tremendous positive results in terms of wealth creation and growth in the economy concerned. Maritz and Brown(2013)

### **Business Incubator: Key agent to boost Entrepreneurship and Innovation**

Business incubation is an economic development tool primarily designed to help create and grow new businesses in a community. Technical Business Incubators and accelerators extend their support in establishing novel business enterprises which includes the provision of professional support for developing business plans, establishing management teams, fetching funds, and a lot more support and handholding for emerging firms. Sherman and Chappell(1998).

### **Conceptual/ Theoretical Framework of the Proposed Research Area/ Topic**

Traditionally the concept of entrepreneurship & innovation has been briefed about innovative products, but gradually it converted to service-based entrepreneurship and enterprise management, presently, it is majorly technology-based which has almost captured the latest scenario. Montiel-Campos & Palma Chorres (2016). Accepting the important

The term ‘Incubation’ is derived from the Latin word incubation, which observes a practice by the Roman people who are with some elementary innovative ideas which can further be converted into reality over a certain period. The elementary idea of incubation for business start-ups is primarily taken from the field of medicine and refers to organizations that play a major role during the starting phase of novel business enterprise with the provision of various physical infrastructure, other facilities including state-of-the-art office space, handholding, and social networking to fetch fund and stability in the market. Smilor & Gill(1986) Aernoud(2004; Bollingtoft & Ulhoi 2005).

### **PROBLEM STATEMENT**

Technical Business incubators play a very vital role in boosting entrepreneurship, and innovation culture and in giving multi-fold acceleration in establishing new startups and ventures. Most business incubators are not yielding perceived results due to a lack of services offered or functioning policies. So, in this scenario finding critical factors and a successful model business incubator that can ensure success stories is very much required.

### **OBJECTIVES OF THE STUDY**

- To identify and describe the various factors responsible for the performance of Technical Business Incubators and accelerators in the Indian Context.
- To Identify and describe the infrastructure and funding requirements for a performance-oriented business incubator.
- To elaborate and examine the role, policy, and involvement of the Government in the establishment and functioning of a performance-oriented Business Incubator.
- Development of a model for a successful business Incubator in Indian Context

role, importance, and significant beneficitation of science and technology-driven novel enterprises and startups with attractive economic outcomes. Business Incubators whether it is Private, Public, or university-based incubators aim to promote technology-based innovation and entrepreneurship. Ian et al. (2016).

The role played by the business incubators to boost acceleration for the rapid growth of innovative novel business enterprises during the initial phase of entrepreneurship-driven concepts was recognized

first in the 1950s. Schwartz & Hornych (2010). Batavia Industrial Center, located in Batavia City, New York, USA was the very initial phase business incubator established in 1959. Allen and Bazan (1990). The major focus was to provide infrastructure facilities to the upcoming entrepreneurs during the 1980s, and the focus was transformed by providing business as well as technical expertise to the upcoming enterprises in the 1990s. Business networking, which is one of the most essential requirements to commercialize any business entity is very much recognized in the year 2000. Bruneel (2012) & Mian (2016).

### Technology Business Incubator

A Technology business incubator or accelerator is typically an organizational setup that promotes the setting up of an ecosystem to nurture various enterprises by providing support to them during their incubation period. The support may include providing state of the art facility for workspace, shared office services, and access to specialized equipment, labs, and workshops along with value-added services like fundraising, legal services, business planning, technical assistance, and networking support. Technology Business Incubators: An Indian Perspective & Implementation Guidance Report by e-Centre for Internet and Society, India.

The National Business Incubator Association (NBIA) is a well-recognized organization that promotes business incubation & entrepreneurship. It provides the support and services of thousands of professionals regarding the establishment of novel business enterprises. NBIA (2000). Business incubators are key to securing higher rates of revenues from tenant employment, which may include a considerably large number of intellectual property applications per tenant firm. Phillips (2002). In the study with the context of the emerging economy of 31 Business Incubators and several organizations in Sao Paulo, Brazil, it has been found a very close connection between the number of new product launches and formal agreements with research centers, and also between the number of new product launches and funding received from external entities, especially the funding agencies, underlining the significant role of knowledge and relationship facility and support provided by Business Incubators. Fernandes et al. (2017).

### Government Initiatives: Entrepreneurship, Incubation, and Innovation an Indian Perspective

#### National Education Policy (2020)

In the current scenario of National Education Policy 2020, the Role of incubation in the Indian Higher Education system plays an important role in boosting the rate of novel enterprise establishment. The NEP emphasized that higher educational institutes must focus on enterprise development through innovation and incubation centers.

### An Overview of Incubation Centres in India

The incubator establishment process started in the late 1980s because of a policy for promoting entrepreneurship, innovation & new business venture development. The process started with the vision and handholding of the United Nations Fund for Science and Technology (UNF&ST) during (1987-1990). In 2000 India again started its innovation program with the vision to establish Technology Business Incubator. By the end of 2004, 15 business incubators were set up in India by the intervention and support of the National Science & Technology Entrepreneurship Development Board (NSTEDB) at the institutions of excellence, majorly at IIT and IIM. By the end of 2009, the number has jumped to 120.

### Business Incubator Models

The establishment of various Business Incubators based on the three types of revenue generation models:

1. **Landlord Model:** This model suggests that majorly the income generation source of the business incubator income is leasing activity & the other source of income is in terms of client fees for consulting and other services. This "landlord" model can be financially self-sufficient but renders low economies of scale.
2. **Equity-based Model:** This model suggests that the revenue comes from the equity position in the incubated enterprises. This method requires sufficient initial investment and great patience, as it may take up to a longer period of more than 10 years to generate revenues.
3. **Sponsor Funding-based Model:** It is based on sponsor funding from the university, or from the government side, and maybe through the industry side. The most common form of incubator model is found in University-Based Incubators. Hemalata Radhakrishna & Patel Nagaraj Goud (2017).

### Functions & Services Offered by Business Incubators

Business incubators expressed their value proposition by offering state-of-the-art infrastructure and providing business support services like mentoring support, and handholding support for upcoming enterprises. Johan Bruneel, Tiago Ratinho, Bart Clarysse & Aard Groen (2012).

A Business Incubator is a unique support & facility that is essential for the early-stage growth of business ventures by ensuring various services such as working space, shared office space with shared services, and | JOURNAL OF IPEM Vol. 18, July 2024 technical as well as managerial. Gissy (1984).

Business incubators are also identified as effective tools for identifying talent, technology generation,

The business incubator generally offers a variety of services which are as follows described by Bergek and Norrman (2008)

- (a) Shared office space, on a rental basis with favourable terms and conditions for Incubates
- (b) Professional business support, advice, and training programs for new entrepreneurs.
- (c) Handholding and Networking support whether internal or external.

Johnston, Brignall, and Fitzgerald 2002

The performance of a business incubator can be assessed through the assessment of parameters.

- (a) The incubate is surviving and growing profitably.
- (b) Incubation operations were terminated if there was a loss in operating the services of the business incubator

Hackett and Dilts 2008

fund mobilization, and technical know-how providers for nurturing entrepreneurial as well as innovative talent to accelerate the development of new ventures in the region. Hanadi Mubarak Al-Mubarak & Michael Busler(2017).

**Performance Indicators of Business Incubators**

The performance indicator of the successful business incubator is based on the number of patents granted, support services offered by the incubator, selection criteria to incubate, exit policy and criteria for the incubated innovator, academia, and corporate linkage. Vishal Gandhi, Asif Ali Syed & Sudhir Kumar Jain(2021).

**Business incubation constructs with their definitions (Hackett and Dilts 2008)**

**Selection criterion and performance:** It refers to the extent by which the business incubator behaves like an “ideal type” venture capitalist during the selection of budding startups for mentoring and resource allocation.

**Monitoring and business assistance intensity:** Monitoring and business assistance intensity refers to the extent to of the business incubator assists the incubate firms.

**Resource munificence:** Resource munificence means the availability of the incubator resource availability, quality, and rate of utilization

**Table- 1 Author, Year of study regarding Performance Management system.**

S.N.	Author	Year of Study	
1	Allen and McCluskey	1990	1. Occupation 2. Jobs created 3. Graduated companies
2	Udell	1990	<ul style="list-style-type: none"> <li>• Establishing business by incubating</li> <li>• Completion of the prototype by incubated.</li> <li>• Finishing of business plan</li> <li>• Starting of production</li> <li>• Reaching BEP</li> </ul>
3	Weinberg et al.	1991	<ul style="list-style-type: none"> <li>• Firm Survival</li> <li>• Turnover</li> <li>• Employment</li> </ul>
4	Bearse	1998	• Meeting goals and objectives
5	Adegbite	2001	• Survivability of tenant and Graduate Companies
6	Aernoudt	2004	• Space (sq. feet)

## Role and Importance of Business Incubators

			<ul style="list-style-type: none"> <li>• Survival rate of graduates</li> <li>• Employment generated</li> </ul>
7	Author Allen (1985) Allen & Rehman (1985)	1985	<p>Shared Services:</p> <ol style="list-style-type: none"> <li>1. Logistical &amp; Physical Services               <ol style="list-style-type: none"> <li>a. Security Services</li> <li>b. Computer Facility</li> <li>c. Conference Room Facility</li> <li>d. Custodial Service</li> <li>e. Photocopier</li> <li>f. Furniture &amp; Equipment</li> <li>g. Library</li> <li>h. Telephone Equipment</li> </ol> </li> <li>2. Shared Business Support Services               <ol style="list-style-type: none"> <li>a. Receptionist</li> <li>b. Typing</li> <li>c. Clerical</li> <li>d. Filing</li> <li>e. Mail Services</li> <li>f. Word Processing</li> <li>g. Off-Hours Answering Machine</li> <li>h. Audio Visual Equipment</li> <li>i. Shipping &amp; Receiving</li> </ol> </li> <li>3. Business Consulting Assistance or Expertise (Financial Consulting)               <ol style="list-style-type: none"> <li>a. Business Taxes</li> <li>b. Risk Management and Insurance</li> <li>c. Government Grants &amp; Loans</li> <li>d. Government Procurement Process</li> <li>e. Equity &amp; Debt Finance Arrangement</li> <li>f. Export Development Assistance</li> </ol> </li> <li>4. Business Consulting Assistance or Expertise (Management Assistance)               <ol style="list-style-type: none"> <li>a. Business Plan Preparation</li> <li>b. Employee Relations</li> <li>c. Advertising &amp; Marketing</li> </ol> </li> <li>5. Business Consulting Assistance or Expertise (Professional Business Service)               <ol style="list-style-type: none"> <li>a. Legal Counselling</li> <li>b. Patent Assistance</li> <li>c. Accounting</li> <li>d. Book- Keeping</li> </ol> </li> </ol>
8	Allen(1987)	1987	<p>Incubator Governance</p> <ol style="list-style-type: none"> <li>1. An Experienced Incubation Manager</li> <li>2. A Keyboard of Directors</li> <li>3. A Noted Advisory Council</li> </ol>
9	Allen(1985) Smilor (1987)	1985	<p>Tenant Entry &amp; Exit Criteria</p> <ol style="list-style-type: none"> <li>a. Ability to create jobs.</li> <li>b. Present a written business plan.</li> <li>c. Have a unique opportunity.</li> <li>d. Locally owned firm</li> </ol>

			<ul style="list-style-type: none"> <li>e. Space Requirements</li> <li>f. New Start-up Firm</li> <li>g. Affiliated with the University and be able to pay operating expenses.</li> <li>h. Time Limit on Tenancy</li> </ul>
10	Smilor(1987) Allen (1985)	1987	Mentoring & Networking <ul style="list-style-type: none"> <li>a. Entrepreneurial Network</li> <li>b. Entrepreneurial Education</li> <li>c. Tie to a University</li> <li>d. Community Support</li> </ul>

**Performance Challenges of Business Incubators**

There are various problems and challenges related to finance have been faced by Startups in India. Sharifi & Hossain (2015). However, sooner or later, they had to realize their roles as providers of support for the start-up period of the firm’s formation, and not as an extended low-cost facility. InBIA, 2017.

The stability and sustainability of the business incubator can be ensured through essential and prudent investments in developing facilities required for incubation as well as very careful monitoring of

various operating expenses and innovative methods of maintaining and raising income. Lalkaka (1990).

There are various problems existing in the Construction of Chinese Business Incubators the development between various regions is unbalanced as well as the incubation function is not perfect, the financing facility is lacking, and the quality of incubator personnel is poor. There is a considerable lack of cooperation between incubators on resource sharing and complementary advantages to each other. Xianmin Zhang<sup>1</sup>, Yang Xiao & Peijian Wu (2021)

**Number of Research Articles Reviewed**

Total no of Research Articles Reviewed =75

Total No of Reports Reviewed=02

S.NO.	Variable	No. of Research Articles Reviewed
1	Present Eco-System of Business Incubators	31
2	Functions & Services offered by Business Incubators	27
3	Performance Indicators of Business Incubator	18
<b>TOTAL</b>		<b>76</b>

**Summary of the Variables/Parameters identified in Research Article Reviewed**

**Present Eco-System of Business Incubators**

## Role and Importance of Business Incubators

---

S.No.	Variables	No. of Articles
1	Business Incubators Worldwide	8
2	Business Incubators In India	6
3	Business Incubators In Emerging Economies	6
4	Government Initiative	8
5	Business Incubation Model	3
	<b>Total</b>	<b>31</b>

### Function & Services offered by Business Incubators

S. No.	Variables	No. of Articles
1	Preincubation	4
2	Incubation	3
3	Facilities: Financial Services, Infrastructure Support, Managerial & Technical Support Services	8
	<b>Total</b>	<b>15</b>

### Performance Indicators of Business Incubator

S. No.	Variables	No. of Articles
1	Business Incubation Constructs	7
2	Performance Management System	12
3	Performance Challenges	7
4	Perceived Performance at Various Levels of Society	4
	<b>Total</b>	<b>30</b>

## RESEARCH GAPS

- It has been identified that very little research has been done on the development of a Successful Business Incubator model in Indian Concern.
- It has been identified that very few research are available to identify the exact performance measures of Business Incubators in the Indian Context.
- It has been identified that a very low number of studies have been done on the establishment of Business Incubators in Academic Institutions.
- Very Few studies have been done the handholding and networking among Business incubators in India and abroad.
- Research does not show the well-defined policy and measures of entry and exit of incubates in any business incubators.

## SCOPE OF THE STUDY

The scope of this research is to systematically observe and analyze the relationship between the facilities, services offered, functioning and operating policy, and performance of business incubators in the Indian context. Further, the research is focused on finding critical performance factors for successful and result-oriented business incubators. This will help to provide a more comprehensive understanding of the variables influencing the choice of business incubators by innovators.

## Expected Contributions of the Study

The contribution of the proposed research is focused and beneficial towards the following aspects:

1. By finding the critical performance factors of the Business incubator will be helpful for the innovator to choose the right business incubator for them.
2. The research will be beneficial for business incubators in identifying optimum facilities and services offered to the incubates.
3. The research will be beneficial in identifying the robust policy and strategy for successful result-oriented functioning of the business incubators.

## CONCLUSION

In the recent scenario, the role and importance of a business incubator is vital in boosting the culture of innovation and entrepreneurship among the youth studying science and technology. The business incubators or accelerators are the economy-driving agents as these are responsible for establishing innovation-based novel business enterprises and employment generation in place of seeking employment from other sources at large.

The proposed research revolves around the present ecosystem, services offered, and performance indicators of business incubators and finding an appropriate functional model for a successful business incubator.



### REFERENCES

- Aernoudt, R. (2004). Incubators: Tools for entrepreneurship? *Small Business Economics*, 23(2), 127–135.
- Allen, D. N. and Rahman, S., (1985), “Small Business Incubators: A Positive Environment for Entrepreneurship”, *Journal of Small Business Management*, Vol. 23, pp 12-22
- Allen and McCluskey, (1990) *Structure, Policy, Services, and Performance in the Business Incubator Industry*, Entrepreneurship Theory, and Practice
- Adegbite, O (2001), *Business Incubators and Small Enterprise Development: The Nigerian Experience*, *Small Business Economics*
- Allen, D. N., & Bazan, E. J. (1990). Value-added contributions of Pennsylvania’s business incubators to tenant firms and local economies. Washington, DC, and University Park, PA: Appalachian Regional Commission and Smeal College of Business, Pennsylvania State University.
- Baumol, W. J. (2010). *The micro theory of innovative entrepreneurship*. Princeton, NJ: Princeton University Press.
- Barot, H.,(2015). Entrepreneurship - A Key to Success. *The International Journal of Business and Management*, Vol.3, No.1, January 2015; 163-165.
- Barbero, J.L., Casillas, J.C., Ramos, A. and Guitart, S. (2012), “Revisiting incubation performance: how incubator typology affects results”, *Technological Forecasting and Social Change*, Vol. 79 No. 5, pp. 888-902.
- Bergek, A., and C. Norrman (2008). “Incubator Best Practice: a Framework,” *Technovation*, 28, 20-28.
- Birch, D. L. (1979), “The Job Generation Process”, M.I.T. Program on Neighbourhood and Regional Change, Cambridge, MA
- Bearse, P (1998) *A Question of Evaluation: NBIA’s Impact Assessment of Business Incubators*, *Economic Development Quarterly*
- Bruneel, J. Ratinho, T. Clarysse, B., & Groen, A. (2012). The evolution of business incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, 32(2), 110– 121.
- Crossan, M.M. and Apaydin, M. (2010), “A multi-dimensional framework of organizational innovation: a systematic review of the literature”, *Journal of Management Studies*, Vol. 47 No. 6, pp. 1154-1191.
- Cohen, S. G., & Hochberg, Y. V. (2014). Accelerating startups: The seed accelerator phenomenon (SSRN Working Paper No. 2418000).
- Croci, Cassidy L., (2016). "Is Entrepreneurship a Discipline?". Honors Theses and Capstones. 296. Cited from <https://scholars.unh.edu/honors/296>. University of New Hampshire Scholar’s Repository.

- Dutt, N. Hawn, O. Vidal, E. Chatterji, A. McGahan, A., & Mitchell, W. (2016). How to open system intermediaries address institutional failures: The case of business incubators in emerging-market countries. *Academy of Management Journal*, 59(3), 818–840.
- Dorcas Njoki Mungai & Dr. Agnes Njeru(2015), Effect of Business Incubator Services on Performance of Business Ventures at Nairobi Incubation Lab, Kenya, *International Journal of Science and Research (IJSR)* 1500-1506
- Fernandes, C. C. Jr, Oliveira M. D. M., Sbragia, R., & Borini F., M. (2017). Strategic assets in technology-based incubators in Brazil. *European Journal of Innovation Management*, 20(1), 153–170.
- Gissy, F. (1984), “Incubator Industrial Buildings: A case study”, *Economic Development Review*, Vol.2, No. 2, pp. 48-52
- Govindarajan, V., and Fisher, J. (1990), “Strategy, Control Systems, and Resource Sharing: Effects on Business-Unit Performance”, *Academy of Management Journal*, Vol. 33, No. 2, pp. 259-285
- Hackett, S.M., and D.M. Dilts (2008). “Inside the Black Box of Business Incubation: Study B – Scale Assessment, Model Refinement, and Incubation Outcomes,” *The Journal of Technology Transfer*, 33, 439-471.
- Hanadi Mubarak Al-Mubarak & Michael Busler(2017), Challenges and opportunities of innovation and incubators as a tool for a knowledge-based economy, *Al-Mubarak and Busler Journal of Innovation and Entrepreneurship*, 6-15
- Hemalata Radhakrishna & Patel Nagaraj Goud (2017), An Evaluation of The Role of Business Incubators and Accelerators in Indian Start-up Ecosystem, *International Journal of Research in Economics and Social Sciences (IJRESS)*,445-453
- Hekkert, M. P., Suurs, R. A., Negro, S. O., Kuhlmann, S., & Smits, R. E. (2007). Functions of innovation systems: A new approach for analysing technological change. *Technological Forecasting and Social Change*, 74(4), 413–432.
- Hackett, S.M. and Dilts, D.M. 2004. "A Systematic Review of Business Incubation Research", *Journal of Technology Transfer* 29 (1): 55-82.
- Hanadi Mubarak Al-Mubarak, Wafi Al-Karaghoul, Michael Busler(2010), the creation of business incubators in supporting economic developments, *European, Mediterranean & Middle Eastern Conference on Information Systems 2010 (EMCIS2010)* April 12-13, 2010, Le Royal Meridien, Abu Dhabi
- Bert F. Hoselitz & Glencoe: *Theories of Economic Growth*. The Free Press, 1960. Pp. 344
- International Business Incubation Association (InBIA). (2017). Operational definitions. InBIA. <https://inbia.org/wp-content/uploads/2016/09/InBIA-Industry-Terms.pdf?x84587>

## Role and Importance of Business Incubators

---

- Johnston, R., S. Brignall, and L. Fitzgerald (2002). “‘ Good Enough’ Performance Measurement: A Trade-Off between Activity and Action,” *Journal of the Operational Research Society*, 53, 256-262.
- Johan Bruneel, Tiago Ratinho, Bart Clarysse & Aard Groen (2012), *The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations*, *Tec novation* 32-110-121
- Khanna, T., & Palepu, K. G. (1997). *Why focused strategies may be wrong for emerging markets*. *Harvard Business Review*, 75(4), 41–51.
- Kishinchand Poornima Wasdani, Abhishek Vijaygopal, and Mathew J. Manimala (2022) *Business Incubators: A Need-Heed Gap Analysis of Technology-based Enterprises*, *Global Business Review* 1–23, Sage Publication.
- Kaushal Sad (2020), *Impact of Business Incubators or Accelerators on Startups: An Empirical Analysis*, *International Journal of Science and Research (IJSR)*, 433-435
- Kanchan Lala & Kunal Sinha (2019), *Role of Technology Incubation in India’s Innovation System: A Case of the Indian Institute of Technology Kanpur Incubation Centre*, *Millennial Asia* 10(1) 91–110.
- Lalkaka, R. (1990), ‘*Practical Guidelines for Business Incubation Systems: How to establish a Business Incubation System*’, United Nations Industrial Development Organization (UNIDO), New York, 1990, p. 25
- 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.
- Lundvall, B.-A. (1992). *National systems of innovation: Towards a theory of innovation and interactive learning*. London: Pinter Publisher. (2007). *National innovation systems: Analytical concept and development tool*. Industry and Innovation
- Lesáková, L. (2012). *The Role of Business Incubators in Supporting the SME Start-up*, *Acta Polytechnica, Hungarica*, 9 (3), pp. 85-95.
- Manimala, M. J., & Wasdani, K. P. (2015). *Emerging economies: Muddling through to development*. In Manimala, M. J. Wasdani, K. P. (Eds.), *Entrepreneurial ecosystem* (pp. 3–53). Springer.
- Maritz, P.A. and Brown, C. (2013), “*Illuminating the black box of entrepreneurship education programs*”, *Education + Training*, Vol. 2 No. 3, pp. 234-252.
- Mohamed Imam Salem (2014), *The Role of Business Incubators in The Economic Development of Saudi Arabia*, *International Business & Economics Research Journal* Volume 13, Number 4 853-860
- Mowery, D. C., & Sampat, B. N. (2004). *Universities in national innovation systems*. In J. Fagerberg, D. C. Mowery, & R. R. Nelson (Eds.), *The Oxford Handbook of Innovation* (pp. 209–239).

- 
- Montiel-Campos, H., & Palma-Chorres, Y. M. (2016). Technological entrepreneurship: A multilevel study. *Journal of Technology Management & Innovation*, 11(3), 77–83.
- Mazzoleni, R., & Nelson, R. R. (1998). The benefit and cost of strong patent protection: A contribution to the current debate. *Research Policy*, 27(3), 273–284.
- Matt, M., & Tang, M. F. (2010). Management of University incubators in China and in France: A comparative analysis. *International Journal of Entrepreneurship and Innovation Management*, 11(3), 282–301.
- Meru, A.K. & Struwig, B. (2011). An evaluation of the entrepreneur’s perception of business incubation in Kenya, *International Journal of Business Administration*, 2 (4), pp. 112-121.
- Mian, S. Lamine, W., & Fayolle, A. (2016). Technology business incubation: An overview of the state of knowledge. *Technovation*, 50–51, 1–12.
- Mrkajic, B. (2017). Business incubation models and institutionally void environments. *Technovation*, 68, 44–55.
- National Business Incubation Association (NBIA). (2009). *Impact of business incubation in the US - Lessons for developing countries*. Athens, OH: Author
- Niammuad, D., Mapompech, K. & Suwanmaneepong, S. (2014). Entrepreneurship Product Innovation. A second order factor analysis, *The Journal of Applied Business Research*, 30 (1), pp. 197-120.
- Nkosinathi Sithole1 & Robert O. Rugimbana(2014), Commercialisation of research and technology: A multiple case study of university technology business incubators, *African Journal of Business Management*,641-659
- Pirnay, F., Surlmont, B., & Nlemvo, F. (2003). Toward a typology of university spinoffs. *Small Business Economics*, 21(4), 355–369.
- Phillips, R. G. (2002). Technology business incubators: How effective as technology transfer mechanisms? *Technology in Society*, 24(3), 299–316.
- Plosila, W. and D.N. Allen, 1985, ‘Small Business Incubators and Public Policy: Implications for States and Local Development Strategies,’ *Policy Studies Journal* 13, 729– 734.
- Rudy Aernoudt, (2004) *Incubators: Tools for Entrepreneurship?* *Small Business Economics*
- Robles, N. (2017), “Development of university’s business incubators in Panama”, Master Thesis, Faculty of Engineering Economics and Management, Institute of Business, Riga Technical University
- Roura, J.C. (2015), “Business incubation: innovative services in an entrepreneurship ecosystem”, *Service Industries Journal*, pp. 1-18.
- S.Pratibha, Professor,2019, Role of Business Incubators on Startups Success: Indian perspective, *Journal of Emerging Technologies and Innovative Research (JETIR)*,339-342.

## Role and Importance of Business Incubators

---

- Schumpeter, Joseph A., 1934, *The Theory of Economic Development*, Cambridge, MA: Harvard University Press.
- Shane, S., & Stuart, T. (2002). Organizational endowments and the performance of university start-ups. *Management Science*, 48(1), 154–170.
- Sherman, H., and Chappell, D.S. (1998), “Methodological Challenges in Evaluating Business Incubator Outcomes”, *Economic Development Quarterly*, Vol. 12, pp. 313-321
- Schwartz, M., & Hornych, C. (2010). Cooperation patterns of incubator firms and the impact of incubator specialization: Empirical evidence from Germany. *Technovation*, 30(9–10), 485–495.
- Sharifi, O. & Hossain, B.K. (2015), Understanding the financing challenges faced by start-ups in India, *International Journal of Science Technology and Management*, 4(1), 264-272.
- Thobekani Lose, Vuyani Rens, Khulekani Yakobi, Francis Kwahene(2020)Views from within the incubation ecosystem: discovering the current challenges of technology business incubators, *Journal of critical reviews*,5437-5444.
- Tang, M., Baskaran, A., Pancholi, J., & Lu, Y. (2013). Technology business incubators in China and India: A comparative analysis. *Journal of Global Information Technology Management*, 16(2), 33–58
- Udell (1990) Are Business Incubators Creating New Businesses and New Products, *Journal of Production and Innovation Management*
- Vishal Gandhi, Asif Ali Syed & Sudhir Kumar Jain(2021), A Study of Performance Indicators of Technology Business Incubators (TBIs) in India, *Parikalpana - KIIT Journal of Management*,127-137.
- Vinney Zephaniah Vincent & K.A. Zakkariya(2018), Business Incubation and Technology Start-ups: A review of the concept, impact, benefits, and challenges in Indian perspective, *Journal of Asia Entrepreneurship and Sustainability Vol XIV, Bilingual Iss 3*,44-77.
- Wissema, J. G. (2009). *Towards the third-generation university: Managing the university in transition*. Cheltenham: Edward Elgar.
- Weinberg, M. L., Allen, D. N., & Schermerhorn, J. R. (1991). Interorganizational challenges in the design and management of business incubators. *Policy Studies Review*, 10(2/3), 149–160.
- Wagner, K. V. 2006. “Business development incubator programs! An Assessment of performance in Missouri”. A Dissertation presented in partial fulfilment of the requirement for the degree of Doctor of Philosophy. Capella University.
- Xianmin Zhang, Yang Xiao & Peijian Wu(2021), Research Status and Development of Business Incubator in China, *Open Access Library Journal 2021, Volume 8*,1-9