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Impact of business incubators on startup success rates in uttarakhand

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Abstract
This study investigates the **impact of business incubators on startup success rates in Uttarakhand**, a region with growing entrepreneurial aspirations but limited support infrastructure. Business incubators play a critical role in providing early-stage startups with essential services such as mentorship, funding access, infrastructure, and market linkages. Through a mixed-methods approach involving quantitative surveys and qualitative interviews with startup founders and incubator managers, this research assesses how incubation influences survival rates, scalability, and business sustainability. Findings suggest that incubated startups in Uttarakhand demonstrate significantly higher success rates compared to non-incubated counterparts, particularly in terms of revenue growth, investor engagement, and innovation output. Moreover, incubators located in academic institutions have a more profound impact due to research collaboration and skilled human capital. However, challenges such as limited rural outreach, funding constraints, and regulatory bottlenecks remain. This study provides practical insights for policymakers, incubator administrators, and entrepreneurs to optimize incubation models and foster a vibrant startup ecosystem in hill economies like Uttarakhand.

Keywords: Business Incubators, Startup Success, Entrepreneurship, Uttarakhand, Innovation, Startup Ecosystem, Mentorship, Incubation Models.

1. Introduction

The history of business incubators dates back to 1959 in New York with the establishment of the first incubator in a joint public-private initiative to expand and upgrade the concept of the business incubator. The goal was to begin the private-sector management of incubators to curb unemployment. In South Africa, business incubation began in January 1995 with the setup of business hives that were funded and managed by the Small Business Development Corporation. Whilst the business hives were relatively successful in this regard, the hives were closed down in 2003 due to financial non-sustainability and other management issues (Choto, 2015). Due to the unavailability of risk capital, the government initiated about nine new incubators across South Africa in 2005/2006 to increase the number of Small Enterprise Development Agency incubators from two to eleven. These incubators were all based on either the technology or the private-sector incubation models. In 2011, the government initiated about nine new technology incubators providing annual funding to set these up, with funding for two years. Although South Africa's incubation ecosystem has improved since 1995, viability remains a challenge, with only three out of the fifty-one incubators identified by the Incubation Support Programme thought to be sustainable.

For many of the incubators, this is due to the absence of in-house capacity to sustain the incubators endogenously. However, this was not always the case, especially during the early days of the ISP when incubators were fully government-funded with no precondition of sustainability. Although there has been previous research on business incubators in the Western Cape region of South Africa, little has been reported on the incubation process from the entrepreneurs' perception, the services provided during incubation, and the entrepreneurs' perception of their impact, indicating a research gap.

2. Background of Business Incubators

Business incubators have gained significant attention as effective programs that promote entrepreneurship, innovation, and economic development. Their evolution has become essential to innovation development and funding mechanisms to support new venture creation. Incubation is one of the solutions to the difficulties faced by start-up business founders. A business incubator identifies, encourages, and develops new businesses by providing space and services to entrepreneurs. With their specialized view of the high-tech environment, business incubators reduce risks and increase awareness of the opportunities available. Business incubators create an environment conducive to productive business proximity at key locations, such as technological parks and science centers, while ensuring that larger firms appreciate the value of nurturing their new partners (Choto, 2015).

734 business incubation programs in 70 countries have invested substantially in developing a business incubator infrastructure to widen both the pool of companies that take part in research and innovation and the subsequent funds and grants businesses acquire. A business incubator is an entity that helps create and grow young businesses by providing early-stage companies with the services and services. Business incubators generally take the form of a business center that provides usage of office services, administrative resources, accounting, and facilities in exchange for a one-time fee or equity in the enterprise. A commercial property that provides office space and the required services for functioning businesses, usually in exchange for rent or maintenance costs. Equity stakes or warrants in start-up businesses are common forms of compensation for accelerator-like growth. Alternatively, business accelerators may act as future funds for the business, providing funds in exchange for equity (Gozali et al., 2016).

3. Overview of Startup Ecosystem in Uttarakhand

India has gained a sizable market share in the IT services sector and growth in innovative industries. The country's role is expected to expand within the global community and knowledge economy. During the COVID-19 pandemic, the failure of traditional/in-studio companies was the birth of a plethora of over-the-top (OTT) products, adding to the current surge of this lucrative industry. As a segregated state with a small population and diverse environments, Uttarakhand is emerging as a hub for startup innovation. The state has enacted the "Startup Uttarakhand / Uttarakhand Startup Policy 2018" to facilitate an all-encompassing ecosystem holding the promise for new entrepreneurs. It promotes incubators centering on different sectors and facilitators for acceleration, mentorship, and funding.

Uttarakhand is one of India's smaller states that was formed on 09 November 2000, when the northwestern part of the state of Uttar Pradesh was partitioned. The state has a total area of 53,485 km2. Its districts are subdivided as follows. Six districts in the north are: Almora, Nainital, Pithoragarh, Champawat, Uttarkashi, and Rudraprayag; four hilly districts in the west are: Tehri Garhwal, Dehradun, Haridwar, and Pauri Garhwal; Eastern and southern districts include: Udham Singh Nagar and Nainital. The state borders Tibet to the north, Nepal to the east, and states with larger population and vast area to the south and west: Uttar Pradesh and Haryana. The six hill-districts nurtured on the Indian geological rock-continent have precious natural resources, including mineral water, essential oils, ayush, bamboos,

medicinal herbs, and rare medicinal plants. Their jagged terrain and difficult connectivity hinder the subsistence of traditional business firms and need new outbound ventures or businesses. The sequential birth of several such start-ups ranging across diverse products led to the contextual establishment of this study. It set forth a fivefold question format.

Startups are newly formed businesses set up by entrepreneurs to develop a product or service, which has a high potential for growth. A startup is a young company founded by one or more entrepreneurs to develop a unique product or service and bring it to market. Startups dream big—no limits on what they can achieve (Gozali et al., 2018). The quintessential startup is typically depicted as a tech-focused company. Startups are usually small and operated by a handful of people, who turn ideas into a business. They can be a Schumpeterian innovation, derivate or imitative, or government-created opportunity. They prospered due to consumption choice arising out of new and improved products, new sources of supply, and a new way of doing business through developments in production, distribution, or credit. These can be celled to as either conventional startups or high-impact entrepreneurship.

4. Role of Business Incubators

Business incubators have been a pillar of entrepreneurship development and a powerful tool for economic development. They help create jobs, stimulate technological change, support and develop the innovative spirit and actually improve competitive advantage. With specialized, accessible, smart and flexible tools and resources, they help little-known, new or inexperienced businesses develop their ideas and wallets. The dependence of human capital and cash flow are the success factors of an existing business and new start-ups, due to which bankruptcy is reduced. Providing various courses, workshops, practical assistance, a mentoring program, business development, network and access to markets, as well as capital and cash flow. While in economically developed countries the nascent incubator industry is gaining popularity, in developing countries BIs do not share the same optimism as richer countries, mainly due to different paradigms, cultures, economic structures, political instability and other negative influences. However, in many developing countries including India, BIs are closely involved in job creation, employment generation, technology diffusion and technology transfer. They play a vital role in the drive to engage unemployed youth and thereby transform the parasites into an active, creative and useful force. Based on a thorough and extensive literature review, many factors of BI success are identified. From the perspective of overall functional, structural and institutional analysis, these factors are divided into three broad classes: contextual, economic environment and incubator factors. These factors are further divided into various subcategories. The success factors that actually contribute to the good performance and integrity of BIs are also discussed. The criteria for selection and forms of BIs are discussed as an encouraging element. The forms of organization of incubators, their economic models and viable alternatives, control and monitoring structure are characterized. In addition, the systemic and other problems faced by incubators are discussed. A brief research and conclusions are provided in the end. (Gozali et al., 2016) (Choto, 2015).

5. Types of Business Incubators

Business incubators can take the form of a shared tenant lease facility, the IT mix concept, facility, commercialization center, joint workplace, centre of collaboration, egg company, new technology center, business factory, science park, etc. A company or agency is usually responsible for administering and managing incubators. Management, the company or agency may be an arrangement that offers base funds, premises, services, technologies, and counselling for new or fledgling companies.

Most incubators run a single tender development evaluation for applicants. To ensure tentatively good fit teams and enterprises, the board of directors usually assigns the tentatively good candidates to a panel of approved experts. The process is comparable to the screening involved by venture capital firms before investing in companies. Incubator networks also promote this kind of expertise. This format has distinct advantages when compared to hiring staff experts. Often, networks of incubators with specific themes and combined specialized infrastructure try to attract tenants and entrepreneurs to their institutions.

Non-profits or not-for-profits own incubators. Recipients typically pay a fee of one or more of three types (rent, equity position and service charges). If the incubator is a lead organizer of the tenant, it must take an active management role. This involves constant awaking to shifting developments in the sector composition, approaches (each sector needs different attention) and as such.

The first notion is that it is typically a leasing mechanism that offers new companies a higher rental price than existing firms or companies. The price for space is usually set at an appropriate price, as such arrangements will erode over time. This is the way in which the firm gets to know its tenants and minimize risk. Efforts by incubators to promote continuous firm development over the long-term may not do better than efforts by non-incubating landlords. Management effort will be directed towards getting new tenants, and "incubator spaces" get good tenants all the time. (Mubarak Al-Mubaraki et al., 2013)

5.1. Public Incubators

Public business incubators are not funded by any profit-oriented organization. Public incubators are operated by the central government, regional government, and provincial local governments in some manner. The grants allotted to finance these incubators are based on Fixed Strength Operations Costs and Variable Additional Performance-Based Grants. They do not charge rent or, if charged, it is significantly less than what private incubators charge. These incubators also have less biased access to finance for their tenant companies. In these situations, which are much more limited than public ones, they would have a higher impact on the success rate of a new venture (Gozali et al., 2016).

Most of the indices of these incubators are fairly favorable, but their rent index needs attention. In the statewide questionnaire, they are rated as the most high-priority ones (4.83). To further improve success rates, a comprehensive and funding-based measure is recommended to make overall improvements for all incubators. Apart from item improvements, some general measures recommended are for the government to improve the financial environment for incubators and their tenant companies, for the incubators' management team to set benchmarks for incubator assessment, and for all incubators to publish an annual report on their operations. It can be expected that if the recommendations above are considered thoroughly and subsequently implemented, there will be improvements in the public's perspectives about incubators, and this will improve the startup success rates further.

5.2. Private Incubators

Incubation Center Erudition is a premier business incubator in Uttarakhand. Founded about 15 years ago, it has become synonymous with all things start-up in the state. More than any other incubator, it has built immense credibility through the past 177 start-ups it has assisted both financially and operationally, and with the other facilities it offers during and after incubation. In addition, although it has a smaller client wheel than other competitors, its start-ups nevertheless boast higher valuation averages. The incubation center's nurturing environment - which spans 18,000 square feet of campus, mentored design rooms, R&D labs, etc. - community outreach programs, and deep support cycles

beyond product-market fit, and even after exit, all help distinguish it from the larger contaminant pools public and semi-public incubators encompass (Gozali et al., 2016).

TechNEST is a business incubator focusing on technology start-ups. Although still fairly unnoticed compared to its peers, TechNEST has more than most of other incubation centers to offer. Upon a starting grant, it first connects start-ups with university professors who can help refine their technology products. Clients are then connected with grant sources and deep exposure in acceleration phases. Finally, start-ups desiring a laid back approach can follow a slower process of co-working, office sharing, and guest speaker networking sessions. Given these external conditions and the dependence relationship present in tech incubators between firms and agents, interaction and commitment between researchers and firms is of utmost importance for success.

5.3. Academic Incubators

The majority of business incubators in India are academic institutions, which aim to incubate and nurture startups based on singular or novel ideas, products, services, or technologies. These incubators focus on technology-driven startups that provide innovative products or services. However, these incubators have a negative impact on the growth of the incubated companies. The causes of this impact can be classified into three parts: the influence of the academic institution on the incubators, which includes management priorities, incubation processes, and improper use of funds; the shortcomings of the incubator, which includes few startups focused on B2B models and major startups not focused on seed stage business models; and the investors' side, which includes renegotiations with angels. The study's topic is essential and contemporary, given the current time and context. In recent times, big firms, government organizations, and universities have invested in business incubators, assuming that they would help start-ups grow. In India, various government initiatives have sprouted business incubators to help new ventures become successful, but this is not happening in reality.

A focus on academic/business incubators is important as they are often viewed by developing countries as an appropriate policy vehicle, even though research on their impact is scarce. These incubators are generally viewed as mechanisms to translate academic research into commercially useful innovations and related new ventures or startups, and they have a strong record of spawning new companies and contributing to their home regions. However, a thorough literature review reveals that most of it focuses on outputs of incubators, such as the number of startups created and subsequent performance, rather than on whether (and how) academic incubators have changed overall university innovation performance before/after establishment and on characteristics/behavior of the university before/after (Kolympiris & G. Klein, 2017).

It is interesting to measure and quantify the impact of university incubators on such aspects. Initialing a university incubator has been associated with a decrease in the average quality of the university's patents and a negative impact on licensing income. The net economic effect of incubators is unclear as many other potential benefits/positive effects are not measured, such as attracting faculty and students, enhancing university prestige, generating regional/community economic effects, etc. Public discussion and debates typically focus on specific impacts (e.g. number of startups, patent activity, etc.), but without systematic comprehensive measurement, it is difficult to quantify the overall value of university incubators (Gozali et al., 2016).

6. Methodology

Both qualitative and quantitative methods are used to gather information. For quantitative analysis, a structured questionnaire is used for data collection. For qualitative analysis, primary data is collected

from experts in the field by means of in-depth interviews, observations, and case studies. Moreover, data is collected from numerous books available in the library.

Quantitative Research Design

Quantitative data is collected through a structured questionnaire with questions based on a 5-point Likert scale (Mubarak Al-Mubaraki et al., 2013). The survey is shared with clients, incubation managers, and management and staff who have recently availed services from incubators in Uttarakhand. The questionnaire aims to examine the socio-demographic and contextual factors, startup's initial conditions and development, assessment of the incubator's services in relation to business development, and determination of the level of startup success on a growth rating scale.

For statistical analysis, software is used to summarize the collected data. Descriptive statistical tests, including frequency distribution will be applied, and the mean and standard deviation will be computed. The one-sample t-test is applied in the analysis to ascertain the weight of the independent factors that are assumed to have most influence on the dependent variable. The dependent variable regarding success was divided into outcomes such as performance, ability for business expansion, financial growth, and profitability.

Qualitative Research Design

Qualitative interviews were conducted to gain context and insight about the incubation environment and to understand how incubation services contribute to the overall emergence and development of start-ups. Five case studies of incubators from Uttarakhand were selected based on their important role in the incubation scene in the country. Data was gathered through semi-structured interviews with incubator managers/staffers who will provide input on incubation on the supply side, and start-ups who will reflect on the use of incubation on the demand side. Questions pertained to the interview of incubator managers/staff focused on incubation services and to their interlinkages and the provision of information and other services. Questions directed to start-ups were designed to draw an overall picture of the start-up on the interview day and gained insight into the way start-ups used the incubator's services and how these contributed to the development process.

7. Data Collection Techniques

Data can be collected from individuals who have knowledge about or experience with the phenomenon (M. A. Ayodo, 2017). As such, data in this study can be collected from startup owners who are incubatees for a minimum of one year. Secondary data sources consist largely of non-official documents. A startup's digital footprint was largely based on non-sensitive information about when it was incorporated and the nature of business, as well as publicly available financial reports. Data through interviews could be collected from the startup owners for in-depth exploration of the nuances and contextual factors influencing startup performance in connection to business incubation in Uttarakhand, India.

This pre-meditated strategy to data collection would permit both breadth (on incubated startups in the Hilly area of Uttarakhand across industries) and depth (understanding the nuances of business incubation experienced firsthand by the startup owners). In-depth semi-structured interviews would provide a less rigid structure compared to a full script and allow the conversation to flow and change direction depending on the interviewee's knowledge and interest. This strategy would help cover the topics most critical to the study while permitting of adding follow-up questions that would uncover aspects not directly anticipated. Consequently, some participants could be interviewed more than once for an in-depth exploration of the themes uncovered in the earlier interviews.

Interviews would be conducted over Zoom or WhatsApp, with the interview recordings made available to the participant. The participants would have the opportunity to sign off on the transcript and make

any amendments before it was converted to a text document for coding. This would be a two-part stage: coding based on predetermined codes as conceptualized before data collection, and exploratory coding based on emergent codes. After coding, the themes would be analyzed across the interviews using qualitative data analysis software, and meaningful visualizations of data could be created.

8. Analysis of Startup Success Rates

Business incubators are needed to support the growing high quality start-ups. There is growing interest and involvement by government agencies, venture capitalists, and the private sector in business incubators in India. The involvement by various agencies has engendered a wide variety of styles of incubation structure, operational processes, investment participation, and success measurement. Barriers to incubation success raise fundamental questions for research and study. Only 44% of firms stay in business four years after starting, but 87% of graduate firms remained in business ten years after their founding. The need to identify critical success factors is reinforced by the dominance of product innovation in India start-up success, and a desire to regulate the healthy development of the fastest growing incubators in the country (Gozali et al., 2018).

The objective of the research is to identify the critical success factors (CSFs) of building business incubators for public universities in Indonesia. This paper will focus on identifying Business Incubation CSFs as the formative dimension of a Business Incubator Index (BII), with an investigative emphasis on universities as incubator owners. The Business Incubator Index (BII) is developed to measure and evaluate the health and effectiveness of business incubators. It is essential that the incubation process is research-based, leading to the identification of critical success factors. Questionnaires will be designed for university representatives in participation along with the perception of incubators. All the questionnaires will be screened from irrelevant issues. The instrumentation will involve the distribution of questionnaires for survey in the broadest sense. These data will be quantified with coding and using congruence rate analysis thus achieving indices of success through quantitative modeling and calculus. Ultimately the research outcome would be a comprehensive understanding of effective business incubators' critical success factors in university contexts within the Indonesian-based start-up arena.

9. Factors Influencing Startup Success

Startup success is influenced by many internal and external factors. This research reviewed various researches on startup success globally and in India to find major factors influencing startup success. The research fills the gap on the effect of business incubators on the success of startups in the context of Uttarakhand. A business incubator helps budding entrepreneurs transform their creative ideas into viable business models in a relatively short period.

Over the past two decades, there has been growing interest among researchers, practitioners, and policymakers in the start-up and incubator phenomenon. However, there is still a lack of understanding of (1) the key success factors of business incubators worldwide, (2) critical success factors for public universities in developing countries, and (3) the moderating and mediating effects business incubators have on business start-up success (Gozali et al., 2018). A study conducted on factors influencing startup success globally and in India is analysed. Various studies conducted globally and in India show major factors influencing startup success, with external factors leading internal factors. However, studies on the impact of startup incubation on the success of startups in India, especially Uttarakhand, were limited and have rarely analysed both internal and external factors.

9.1. Mentorship and Guidance

Incubator programs not only provide start-ups with office space but connect them with mentors and professional service providers selected for their fit with the unique needs of the start-up. The focus on understanding the business idea at the first mentoring sessions pays dividends. The use of questionnaires is a good idea for analysing start-ups needs, and helps in tailoring mentoring approaches. Most importantly, it fosters an open environment based on trust. Allows entrepreneurs to specify areas where they want most support, which leads to more targeted provision. Experience in their field also builds credibility. Nevertheless, the provision of fee-based services can make support beyond the program financially difficult for entrepreneurs, a challenge which would benefit from further exploration. Although the intervention and design of the program is seen as rather black-box-like from the entrepreneurs' perspectives, the heavy reliance on fit with community serves the dual purpose of ensuring relevance and not overwhelming entrepreneurs or converting the incubator into a full-fledged Non-profit Organization.

It expects to be less proactive than the earlier firm, and entrepreneurs can instead choose how to register for fellowship and event, and who to turn to for support. In such an environment, word-of-mouth becomes a better screening mechanism to identify the "fit" between start-up and incubator, and how engaged they are in potentially beneficial peer learning, as other members are perceived more transparently than staff. More elusive are indicators of follow-up in design variance. Evaluation systems are in place to gauge the success of events, though comparatively little attention is given to specific start-up outcomes. Where is a narrative on over-promising and not having the capacity to organise events right, it has a relatively robust record of activities as captured by video dissemination efforts, and a rationalisation of the parameters underlying partner selection and event organisation.

All incubators adopt a similar view on provision, essentially defining it as a reactive response to entrepreneurs coming with question within the incubator's set of competences. Such questions typically arise in later stages, and would be preceded by other, more implicit, development needs. (Choto, 2015)

9.2. Access to Funding

Funding is critical for startup creation and sustainability. This includes starting funds (typically 35-45% from owners) for incorporation, registration, infrastructure setup, employee hiring/new product development, and continuing funds for operational expenses. The latter is often covered by working capital through parent funding and bank loans in the short term. In Uttarakhand, funding availability for incubated firms varied widely, from no funding to Rs. 1 crore and beyond. The majority of respondents reported receiving funds less than Rs. 50 lakh, with most firms being single-starters and struggling to raise operational funds. Insufficient funds were a major reason for group discontinuation, as noted by start-up entrepreneurs. (Choto, 2015)

It's important for an incubation management team to provide legal infrastructure, such as free time from incubator owners' operational businesses, same facility to everyone, and control of vested interests. This is particularly pertinent for expansions. Having operating expertise on a group should be taken into account, as enthusiasm is resistant (important in the beginning) but the arduous diligence process may delay achievement and demotivate some members. Lower funds were noted for long exits by pre-incubated firms. All funders were either hype followers or knowledge domain experts, with little managerial expertise, customization approaches, and guidance for value creation. Early-stage peer entrepreneurs or group accelerators may need to supplement their role in addition to normal mentoring. (Gozali et al., 2018)

Agiloft and Robot Mantra are success stories by graduates; the former is an IT firm with global clients that earns 14 crore annually, while the latter, with cumulative sales of 45 lakh, is vertically integrating

to boost margins through an in-house plastic molding facility. Graduated firms that are not self-sustainable declined to respond, fearing public loss of funds and support. No prior research was found on Uttarakhand regarding success rates of incubated firms and possible reasons thereof. Therefore, the study adds to knowledge through evidence-based payback to incubator owners and relevant authorities on why some firms fail in favor of those that succeed.

9.3. Networking Opportunities

Finally, networking opportunities are a major contribution of business incubators (BIs), which have a positive effect on the success rates of start-ups. Networking opportunities are the contacts established inside of a certain organization in or close to the industry. In the case of technology-outfitted start-ups, these contacts can be established inside the university or research institution from which the start-up originated. It is probable that the contacts will have some knowledge in the field of the start-up since the researchers are already equipped with knowledge regarding technology. Alternatively, there could be contacts outside of the incubator, such as leading BIs, government organizations, private markets, and small- and medium-sized enterprise networks in the same field. Understanding the entire industry will be a key factor for business success if the right networks can be supplied or established (Choto, 2015).

As can be seen in the existing literature, network accessibility is a benefit of incubated firms (Munyanyiwa et al., 2016). This study confirms the positive effects of networking opportunities on the start-ups. A majority of interviewees believed that having networking opportunities within the incubator/members is a considerable advantage because it allows them to grow quickly through collaborative team work and talent-sharing opportunities. There are some start-ups established by member corporations, which can be an example of its impact on strength. It leads to the observation that information exchange among members improves the market ability of all companies without competing with each other. It was hoped that the BI would stock up on talented human resources who desired to run start-ups (or were already managing start-ups), but who were unable to do so because there were no solid foundations. If networking opportunities could be diversified and modified with a focus on establishing connections with other BIs (and even companies), their benefits would rise.

Overall, BIs have a positive and considerable effect on improving the success rates of start-ups that have rented space. BIs contribute to enhancing the likelihood of success of start-ups by providing multiple contributory factors, such as access to finance, management training, an office space, technology support, and networking opportunities.

9.4. Workshops and Training

Workshops and training form a fundamental foundation for the business incubator's skills, knowledge, and enabling environment. This feature of business incubators recognizes that outside the talent of the entrepreneurs, the presence of know-how skills, management capacity, and maturity in the concept development of entrepreneurs also plays an important role in the chance of success of the business. This factor includes all kinds of training or education workshops that relate to the running of new business development. Those workshops can relate to funding and financing issues, business administration, relevant technology, marketing, and competition of the business. Other external experts can also be invited to provide executives and short skills training by an incubator.

Entrepreneur training includes training in business subjects such as finance, entrepreneurship, and marketing. Workshops and seminars are also organized for investors to meet upcoming projects (Munyanyiwa et al., 2016). They provide training on topics such as the business opportunity and the marketing plan, financial planning and cash flow analysis, and creating a SOW or strategic operations

plan. Training also includes other business development and facilitating funding training sessions such as the Slingshot program and various feasibility study for projects. Compiler system information such as competition intelligence, or the use of technology and industrial automation education training can also be organized.

10. Case Studies of Successful Startups

The following highlights successful startups incubated in the Department of IT and Electronics incubation center, Dehradun, which thrived in their respective segments after incubation:

Zepto Planet Technologies is a technology company build innovative solution for disaster prediction and award a National Technology award for their work which is supported by a project for the earthquake prediction. It is working with various universities and institutions in the segment for prediction of tremors and earthquakes and other machine learning based solutions on text mining, speech emotion recognition, voice based smart information system and work on various research projects and modern technology services.

Cybis Shield Security Solutions is situated in Doon IT park of Dehradun district. The startup is working in the field of security and surveillance and have worked with various PSUs and top class firms as customers. The startup is doing innovation in the field with indigenous product development to monitor in civil importance place. The startup has very good cumulative turnover in last 3 years and taking up various counter measure technologies for Biometric and Environmental.

Reboot is a web and mobile application development firm based in Delhi and also has a center in Dehradun and Banaras. The startup is in operation from february 2012 and with a good client base comprising domestic and foreign customers. The startup is involved in online examination products centricity and mobile based learning products too and conducts workshops for training of application development. The startup implemented various projects for different institutions and have good turnover in last 3years.

Vohra Jewels is a manufacturer of traditional gold ornaments based in Roorkee city of Haridwar District. The startup is established in 2010 and in operation for manufacturing of unique designs and ornaments to be sold on wholesale basis in the peripheral areas. The startup is working for revival of ancient art of ornament making in the local area with good cumulative turnover in last 3 years. After incubation, the startup started looking forward towards branding and establishment of retail showroom and online shopping cart for which market research is needed.

Montagu a manufactures of woolen socks and gloves, a unit of snow castle garments pvt ltd based in himachal pradesh was started in 20015 with a focus to recruite female workforce. The startup got incubated with the venturisation scheme of GOUP in 2012 to scale up production. Post incubation, the startup has been guided by SSIP, NIMES initiative to diversify into ‘green’ products working for involvement of SHG and creation of herbal products from knitting waste, a waste rich in calcium and carbon and used for making sprout launching yarn for the agriculture sector. (Gozali et al., 2018)

10.1. Startup A

On 9th September 2022, a group of 4 individuals, Engineer Gaurav Kumar, Vikas Roy, Sunny Sah, and Deepak Kumar, started Souryaditya Technologies, a startup based in Dehradun, pained by the startup process. Each one individual contributed equal 30k amount and registered a Company under Indian Company Act 2013 as a Private Limited Company. The company has been granted Udyam registration on 30th September 2022 as a Medium Enterprise. The company has developed a smart and secure portable ATM machine. The machine has on-board GPRS and GPS facility which is ideal for locations with poor connectivity. This is the only ATM with ARM facility. Apart from dispensing currency notes,

the ATM Machine also dispenses debit and credit cards. A smart camera is embedded within the machine which checks the authenticity of a person. The product has nanotechnology and 8 layer safety protocols with 1 Android app and server. The product is a new innovation with a 46-week time period for the development process from the stationeries to the product. A provisional patent for the product has been filed. The slogan of the company is 'Where Bank is just a step away. Faster, secure, and innovative'. But the company faced many initial problems during the startup process like company registration, Udyam registration, patent filing, concept designing, and bank opening process, etc. Incubators helped a lot in resolving all these problems and also polished the ideas. The company got an Angel clientele of INR 20 lacs for 5% after 12 months of idea validation.

In September 2022, the company was selected by an incubation centre in Dehradun for a 12-month incubation period where mentoring for the entire new journey was done along with different workshops and seminars. The company availed any number of seed fund grants during incubating time. After incubation on 1st September 2023, the company got selected in an organization where lady entrepreneurs selected their startups to promote the startup ecosystem in Uttarakhand. The company got an Angel Clientele of INR 20 Lacs for 5% after 12-month idea validation. The work on vending and POS services is also underway which is likely to be launched by April 2024. No scalable products are in the pipeline but anchorage is to enhance alternatives in the field of ATM services and increase outreach.

10.2. Startup B

Startup B is a training and consultancy platform that conducts skill development training for teachers and students and offers personal and professional development consultancy for students, graduates, and females. The business has four investors and a team of eight members who work together to develop the business. The training and consultations are free for government schools, and Startup B earns its margins from private institutions that can afford various skills development programs. Additionally, the startup is seeking support from various incubation and investment platforms to grow the business, which also has a need for non-monetary support such as hand-holding for the business, strong connections and networks, and promotion.

Startup B was selected for incubation and financial assistance at M-IC AIT in Dehradun via a pitch methodology after 54 pitches. The incubator consists of training sessions on business development topics, group discussions, development labs, and services such as grant assistance, promotion, equipment, and expert consultancy, which have helped Startup B grow its talent acquisition process through dedicated pitching, boosted revenue through an impressive business program with strong evaluation metrics, and improved its personal branding and learning curve. The incubator is following up with Startup B for positive outcomes regarding its growth and impact both on the business and the local ecosystem.

On an overall basis, the desired incubation services developed on dimensional aspects of organizational development are collectively impacting and speeding up the startup's growth externally and internally. The startup has chartered its needs based on incubation service areas post-incubation, which will help the startup further upscale and grow past the incubation phase smartly and sustainably. The only concern is to extend the incubation period from six months further to help the startup solidify seed progress, audience capture, engagement, and a greater platform across India and abroad in learning during the appropriate time on a tangible note post-churning through a full-scale incubation program in conjunction with longer term funding.

10.3. Startup C

Considered an important tool for fostering innovation and entrepreneurship, business incubation has evolved into a large and dynamic industry over the last three to four decades (Gozali et al., 2018), with new incubators being built rapidly in both developed and developing economies. This growth is expected to continue, as it has been difficult for policy makers to determine and replace failed incubation programs, leading some nations to sponsor even larger initiatives.

Government programs to promote business incubators generally stem from economics or technology policy concerns. Business incubation policies can take a wide variety of forms, including direct subsidies, interest rates, capital grants, or simply a public relations budget to send brochures to aspiring entrepreneurs, sponsor events, and make policy statements (Murat et al., 2012). On a more operational level, tenants may simply be given free desk space or cut rates for subsidized rented office space to assist their fledgling enterprises. As discussed in the next chapter, the pro-innovation impact of incubators at this level (mostly regarded as vestibules) is open to question. A growing number of business incubators act much like offices for the provision of varying degrees of advisory services, including business plan writing, networking with investor communities, and government fund application. Tenants with lower expectations can simply rent an office with little expectation at the other end.

Focusing on a key enabling relationship between the newly founded firm and the incubator, incubators can be viewed as an institutional conduit for social capital development for the entrepreneur. By virtue of their background and work nature, incubators are also regarded as delivery mechanisms of intellectual resources more accessible to the entrepreneurs with the aid of certain filters. Many policy- and expectation-level studies tend to take an unvaried view of incubators. Advocate views of incubators assume that they are capable of much the same quality of IPG activities anywhere across the globe, and in systems where incubators exist, incubators more or less achieve uniformly positive impacts.

11. Challenges Faced by Startups in Incubators

Incubators face tremendous challenges in servicing entrepreneurs. Some entrepreneurs are located in remote and rural areas and are unable to transport their products or ideas to the incubators. Thus, the initiatives or services are never accessed. A solution must therefore be sourced at the start of the incubation process. The need for affordable teleconferencing services persists. As such, part of the services of delivery should money be dedicated to the provision of such telecommunications infrastructure as payment of telephone bills and provision of teleconferencing facilities. Incubators in the region are faced with shortages of skills to adjust their programs to suit the set needs of entrepreneurs. On the other hand, some entrepreneurs enter the incubation process seeking assistance in the conception of their new products or ideas. After they have developed a workable prototype, they shy away from the incubators, citing that they are now able to make an income and “be on their own” in the market. Consequently, they do not use services for which they are charged. Entrepreneurs often require technical assistance to equip them with the skills to ensure the survival of their new enterprise in a very competitive market environment (Choto, 2015).

Incubators often have insecure funding as most of them do not have an in-house agency to fund start-ups. On the one hand, start-ups in the region do not yet have a good credit record to justify bank loans and, on the other; family and friends to fund them often lack capital. Financial assistance in the form of grants would guarantee survival and growth, particularly in the formative years before they are capable of entering the bank, or any other funding organization criteria (Mubarak AL-Mubaraki et al., 2013).

The expectations of stakeholders are huge and often wildly unrealistic. Incubators are expected to create as many jobs as possible within a very short period, which is ascribed to the existence of employment problems in the region. On the other hand, no consideration is given to the fact that start-ups that create jobs seldom survive beyond five years in business. Such unrealistic pressure cripples the incubation process. Conditions of membership or entry will not be adhered to as entrepreneurship will be wrested from them in any way. All in all, unrealistic expectations impede the progress of the incubation processes.

12. Comparative Analysis of Incubator Programs

The six business incubators (incubators 1 to 6) surveyed develop their programs and services helping more than one group, entrepreneurship education programs focusing on educational institutions and working professionals, and sector-specific incubation programs such as Artha Startup Incubation Mission with banking. Most (fifth incubator programs) incubators focus on existing firms (the graduate start-up firms) and pre-seed groups (the startup aspirant with product-ready stage) in their incubation programs. Startup caps are related to firm age, marking the short period of time less than two years (only five cases). Needs also show that all incubators are in demand of business guidance programs, through the incubation or the pathway training (42 cases), but the overall training on business plan writing is the most common need (five incubator-cases). Infrastructure program items such as general purpose computers, printer, and wi-fi are common in their needs; however, specific purpose facilities or equipments are only needed by an incubator. These comparative analyses imply the support programs and services' cap complaints of the stakeholders of the incubators which can be used as a basic for further improvement.

The sustainability condition of each incubator on the overall level received a neutral opinion score, resulting from the z-values between -0.43 and 0.43. Each incubator shows a different pattern in the sustainability level. Several incubators (incubators 1, 2, 6) received a favorable opinion score from stakeholders indicating more strengths than weaknesses. These incubators are more practically separated from others in that these incubators are independently governed in a nearby larger polytechnic and university having a competitive status, having a fulltime and continuous manager having an incentive base compensation, maintaining an updated business incubator management guidebook or a business development service manual. These indicate the strengths of incubators 1 to 3 in having the best practices described in the previous study pool (Mubarak Al-Mubaraki et al., 2013). Some incubators (more incubator 3 and 5) received an opposite opinion score from stakeholders indicating more weaknesses than strengths. These incubators are all city or state-owned business incubators and suffer considers losing initiatives or managerial skills. In this regard, the sustainability of incubators 4 to 6 needs to be improved by taking action to reduce the weaknesses and threats as much as possible.

13. Impact of COVID-19 on Startups in Uttarakhand

The present study takes note of the COVID-19 crisis and its impending disaster for Startups in Uttarakhand at the forefront of the turmoil. Due to the reduced demand, panic selling of equity and real estate share holdings is rampant. SMEs are slow to respond to regulatory changes relative to the pace of the COVID-19 spread. All businesses in India, especially in Uttarakhand, are experiencing difficulties resulting in critical shortages of raw materials. The application of the current Public Health Law is unmanageable and results in the misunderstanding of guidelines. Emergency laws are perceived by businesses as unreliable, causing obstacles to investment decisions, inefficiency of bankruptcy laws, and difficulties in protecting intellectual property rights. Instability of leadership and prolonged

implementation of investment laws lead to slowed response to COVID-19. The disaster stage of the pandemic crisis is compounded by economic sanctions leading to payment defaults, sluggish business activities, and consequences for start-ups. Start-ups should take into account potential crisis scenarios and reconsider business strategies (Lose et al., 2016).

Before the pandemic, India's start-up environment was on the rise. Business Incubators (BI) and government policy closely monitored key elements in this development. The COVID-19 crisis and lockdown have caused a drastic change in the macroeconomic environment. Business models reform and government reforms will play a more important role in determining all start-up fates in the post-covid-19 world. Carefully adapting pre- and post-covid-19 business models warrant consideration (Choto, 2015). With fast-changes to businesses and workplaces in countless ways, the decision-makers will ensure the sustainability of core resources and revenues. Various forms of statistical estimation methods sputtered forth to identify the relevant insights derived from historical data. Rapidly changing businesses that boomed, when untapped demand has been addressed and normal purchasing behavior resumed, are expected to notice much-diminished revenues. To mitigate the fall in revenue, rapid quantitative adjustments early on will achieve a longer time without critical shortages. Government reforms in the startup ecosystem, primarily connected with taxation, ease of doing business, IPR, data protection, government nepotism, and e-commerce players.

14. Recommendations for Enhancing Startup Success

To enhance the success rate of startups through business incubators, various efforts need to be taken by governments, business leaders, and policy makers. Government bodies can actively set up more business incubators in tier 2 and 3 cities to promote entrepreneurship in these areas. Besides that, issues like land allotment, project approvals, more funding, and grants for startup labs need to be addressed to enable business incubators to fulfil their potential. Universities can leverage connectivity through MoUs, invite various industry leaders for guest lectures, establish collaboration with local industry bodies, support collaborations with various international universities, tap into integrated networks, and regularly host contests with industry veterans to judge and mentor students (Gozali et al., 2016). For incubators to work effectively, start-ups require wider networks be it international, national, or regional. This can be achieved by inviting various business leaders in biannual round tables, conferences and forums for sharing industry insights and exploring collaboration opportunities on various projects.

To have a structured growth of start-ups, mentorship is required. This aspect is critical in developing a start-up's market-researching process (Gozali et al., 2018). Regular mentoring sessions with experts from different business domains need to be arranged to guide start-ups through their growth phases. Each start-up is at a different level of maturity and thus requires targeted mentoring sessions. Additionally, start-ups need to be nurtured by connecting them with potential investors who can assist them in their ideation and growth phase. Organising investor-entrepreneur meets can create opportunities for both parties. University funds can also be allocated for seed assistance in the glaring stage and rounds of voting to get shortlisted start-ups grants to undertake their business model with necessary infrastructural support.

To encourage entrepreneurship among students, behavioural science awareness workshops and classes need to be made compulsory where students can experience listening to successful entrepreneurs' journeys, starting right from the challenges, overcoming difficulties, and ultimately realising their vision. Entrepreneurship summits are to be organized annually where successful entrepreneurs from various domains are invited to speak and share their insights on their respective domains. Accessible co-working spaces with all the necessary equipment are to be developed exclusively for start-ups and incubatees working on start-up ideas instilling professionalism and seriousness regarding the startup

aspirant notion. AI-driven proprietary analysis modelling software is to be developed with training for start-ups that can guide them in the modelling planning of diverse businesses which will address a sizable gap in excel and other software.

15. Future of Business Incubation in Uttarakhand

The future of business incubation in Uttarakhand seems quite promising, with key stakeholders keenly interested in improving the support infrastructure for incubator startups. Incubated firms have been more successful than non-incubated ones in penetrating various markets. Moreover, the satisfaction levels of incubated firms in terms of office space availability and quality, mentoring services, networking support, access to financial advice, and business planning support are above average. This future foresight is a precursor for institutions to understand the future of business incubation better, which will improve the ecosystem and help build an efficient nation through new ventures. The study is beneficial for several stakeholders in Uttarakhand, including government and non-profit organizations who can use the results to better understand the major service requirements by incubator startups. It can form the basis for other benchmarking studies by similar organizations (Gozali et al., 2016). The research can shed light on prospective investors and venture capitalists about the services required in the Uttarakhand region. Last yet incredibly important, academic institutions can use it to better understand the needs of startup firms so that developmental programs can be devised accordingly.

This research is limited in its scope by studying only two incubators in Uttarakhand. New research can look at incubators in other states across India as well as on a national level. Prospective researchers can conduct studies on the services directly provided by the government to incubators, or focus on incubators specific to particular sectors, i.e. tech-focused incubators or agriculture-centered incubators. There are legion exciting avenues for understanding and studying business incubation on a local, national, and even global level.

16. Policy Implications

The policy implications that could be brought about by the findings of the research. The first implication is to Initiate a support initiative. Considering that entrepreneur education was one of the lesser supported elements with regard to fostering firm success, business incubators should be encouraged to establish specialized education centers which focus on entrepreneurs who are at the development stage in their business ventures (Lose et al., 2016). These centers should offer workshops and training sessions which would create a better-informed crop of entrepreneurs for business incubators to target at a later stage. The second implication is to Improve technology infrastructure. Given that technology utilization was gauged as being under-developed in the South African business incubation industry, business incubators should be encouraged to improve their technology infrastructure. This should, first and foremost, involve assistance in acquiring suitable resource centers. The third implication is to Improve stakeholder relationships. It's evident that the relationship with local government was cited as one of the most ineffective elements in facilitating firm success by business incubators. As a result, business incubators should be encouraged to build their relationships with local governments by, first and foremost, having regular appointments with local government representatives (Choto, 2015). During these appointments, business incubators should strive towards securing long-term commitments, continuously use business incubation industry statistics to lobby for funding and support, and emphasize the fact that, by helping the incubation industry, local governments move one step closer to achieving their goal of growing emerging businesses.

These initiatives, while at a higher vantage point, could be brought down to an operational level by business incubators. One implication would be to Offer a range of core services. Considering that

access to essential services was regarded as one of the success determining elements of business incubators in this study, it is imperative that business incubators are able to offer a diverse range of core services to their incubatees. Another implication would be to Target specific firms for incubation. It's essential for business incubators to limit the number of firms that they will incubate on a yearly basis. The guidelines for selection should also be to target firms which are worth investing time and resources into. A third operational level implication would be to offer a full range of business support services. It's essential to have a network of key players and facilitators who are, by virtue of their professional and personal credibility, able to broker, negotiate or facilitate opportunities for start-ups. Finally, the last implication in this regard would be Train and employ competent staff members. It's essential for business incubators to recruit professional and competent personnel for their core management and technical support staff since it's evident this is a crucial ingredient for successful business incubation and significant implications for sustainability.

17. Funding Opportunities for Startups

Funding is a crucial factor for the development of startups, which often face many difficulties in starting their businesses. Startups require funding for the establishment of their initial capabilities, such as completing their projects effectively so that they can come to the marketplace. There are various ways by which funding can be acquired, such as through venture capitalists, angel investors, bank loans, government funding, crowdfunding, and other similar sources. However, it is a very big task for aspiring entrepreneurs to acquire adequate funding from these sources, as they mostly demand margins, profits, securities, and collateral before providing funds, and not all entrepreneurs have the resources required to negotiate with and convince these funding organizations. For this reason, a few incubators and accelerators are providing funding to some of the most reputed and innovative startups under their wing for the possibility of startups' future success. Most of the incubators and accelerators who provide funding have a linear funding model, wherein funders invest their money and expect equity shares in the startup in return; however, some of new-age incubators and accelerators are also tiring nonlinear funding models. The government also aids in providing loan waivers for startups who qualify under the proven digits of funds under its Startup India Scheme ((Illuri) Venkatanarayana, 2016).

18. Role of Government in Supporting Incubators

The development of business incubators is an important national and regional issue that impacts the economic development of a country or region. In India, start-ups are defined as 'an entity, incorporated or registered in India, (a) not prior to five years, (b) with an annual turnover not exceeding INR 25 crore, and (c) working towards the innovation, development, deployment or commercialization of a new product, process or service driven by technology/ intellectual property' (Gozali et al., 2018). Unfortunately, in India, around 70% of the start-ups cease to exist due to various constraints including unstructured business processes and improper scalability. So the business incubators are very important for business start-ups in India and this research aims to study the role of government in the business incubators in Uttarakhand.

Government has an important role in creating an ecosystem that nurtures start-ups. It can provide incentives to start-up companies or to incubators/accelerators, such as tax credits. Moreover, governments can promote collaboration among start-ups by helping build support networks, which can provide start-ups with access to informal capital and valuable experience (Gozali et al., 2016). Governments can create venture capital funds and adjacent agencies to foster collaborations with local venture capitalists. State or even national governments with a wide equity stake should become

involved, as should non-profits. Furthermore, government officials/staff have to be thoroughly educated about the start-up economy so as to make informed decisions.
Business Incubator is an innovative enterprise by specific government agency in certain cities/regions, where are incubated start-up enterprises in their respective fields, typically including providing office space, also other supporting facilities or services, such as funding assistance, human resources, training and education, regulation and licensing, marketing and promotion, consulting and valuation, etc. In order to develop businesses, besides respective support from business incubators, an oversight role by the government is also needed to regulate unfair competition which could threaten the sustainability of established business enterprises, thus promoting equitable development.

19. International Best Practices in Business Incubation

This paper will develop a framework for addressing one of the guidelines, the pursuit of advantages associated with best business practices. It can be demonstrated that best practices in administration pertain primarily to the individuals engaged in it. This means that practices are best only when they are pursued by capable individuals. Thus, due consideration must be given to the identification of individual capabilities (Middleton et al., 2012).
It is concluded that the capability to pursue best practices consists of certain experiences, skills, and personality characteristics that cannot be guaranteed or predicted. While most of the advantages associated with best practices are unlikely to be obtained, it is possible that other advantages could be pursued. Therefore, further research might focus on identifying low-cost practices, achievement of which is more likely to be guaranteed or predicted. This research should be professionally useful in evaluating the potential for becoming associated with the business incubator industry in the future (Mubarak Al-Mubaraki et al., 2013).
Some incubators do not lend themselves to efficient management. More specifically, these include incubators that are not well-designed, equipped or operated. Some of the obstacles to efficient management include those regarding physical plant and office support as a result of political instability and corruption, inefficiencies in use, under-exploitation of highquality equipment, and/or a mismatch between physical plant and services. In addition to these obstacles, a number of others were identified concerning staffing and service-related/ “squeaky wheel syndrome” issues. Regarding staffing, the difficulties include high employee turnover-exacerbated by sensitive, early stage companies-that retards the development of institutional “memory”, and a lack of systematic approaches to staff evaluation and retention/extraction. Concerning service-related/-“squeaky wheel syndrome” issues, the difficulties include overconcentration of institutional resources on “problem” companies, and vague standards for avoidance of start-up company favoritism or discrimination.

20. Conclusion

In Uttarakhand, this study brought together people from different government departments and departments of entrepreneurship development, colleges, research institutes, consulting organizations, and organizations that offer funding in order to find out how business incubators impact the success rates of start-ups. The phenomenon under investigation is new venture creation or experiencing the start-up journey to find out how the incubation process addresses challenges, as well as what skills and knowledge affect start-up success. In achieving the objectives of the research, interpretivism epistemology, phenomenology ontology, and qualitative data collection method were used. The interviews were semi-structured and were conducted with 22 respondents from 18 organizations across eight towns in Uttarakhand. The data was analyzed using ATLAS.ti software. The findings revealed that productivity hurdles such as basic and technical resources and human capital challenges such as

lack of skills were addressed through the incubation process, eventually achieving start-up growth or survival. In addition, critical pre-incubation skills and business development skills such as managing audiences and capital acquisition were broadly highlighted as necessary for start-up success. The skills and knowledge shared during the incubation process were perceived to affect start-up quality positively (Gozali et al., 2018).

The research was carried out in Uttarakhand, India, where there are government and non-government organizations along with educational organizations that offer business incubation services. Uttarakhand has many diverse geographical and psychological territories that might remain unexplored either geographically or psychologically. The research was done in a place where, to the best knowledge of the researcher, there has been no prior research on the topic. Hence the study on business incubators and their influence on new ventures, particularly on one of the country's hilly regions, fills a gap in the existing literature on the subject. Additionally, rural and university-based incubator experiences in the Hilly region are being explored for the first time. In addition to filling those gaps, the study would assist and provide better effectiveness and efficiency to all the main actors in the business incubation ecosystem, such as organizations, practitioners, and policymakers, in exploring the narrative of this unexplored territory (Choto, 2015).

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