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# Towards a Taxonomy of Services Offered by Start-up Business Incubators

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## ABSTRACT

Incubators are becoming increasingly important in today's business world. Incubators are a place where ideas are developed into businesses with the potential to grow and become viable. Incubators had evolved from earlier days when it was predominantly offered in the form of business support to the current model where various elements of success are included in the incubator services. These incubators differ in their types, business model, as well as areas of expertise. The current study focuses on assessing the services offered by start-up business incubators. The focus is on services offered such that the success of the businesses is made possible, and the viability of the business is also improved. The aim of the study was to propose a service framework that can be used to assess the effectiveness of the incubators. The proposed services framework was to consider the current stiff competition for new businesses to stay afloat. After conducting a literature review, seven services were identified. These services lay within business development, mentorship, expertise, as well as partnerships that could bolster any start-up to success. Three University Business Incubators were then selected within the United States for assessment of the application of the identified seven services into their frameworks. Results indicated that much still needs to be done in areas of expertise, partnerships, and future connections to funding for the University Business Incubators to start realizing the full benefits of being in operation.

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# Towards a Taxonomy of Services Offered by Start-up Business Incubators

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## ABSTRACT

*Incubators are becoming increasingly important in today's business world. Incubators are a place where ideas are developed into businesses with the potential to grow and become viable. Incubators had evolved from earlier days when it was predominantly offered in the form of business support to the current model where various elements of success are included in the incubator services. These incubators differ in their types, business model, as well as areas of expertise. The current study focuses on assessing the services offered by start-up business incubators. The focus is on services offered such that the success of the businesses is made possible, and the viability of the business is also improved. The aim of the study was to propose a service framework that can be used to assess the effectiveness of the incubators. The proposed services framework was to consider the current stiff competition for new businesses to stay afloat. After conducting a literature review, seven services were identified. These services lay within business development, mentorship, expertise, as well as partnerships that could bolster any start-up to success. Three University Business Incubators were then selected within the United States for assessment of the application of the identified seven services into their frameworks. Results indicated that much still needs to be done in areas of expertise, partnerships, and future connections to funding for the University Business Incubators to start realizing the full benefits of being in operation.*

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## I. INTRODUCTION

An incubator can be thought of as a place where new businesses (henceforth referred to as start-ups) are helped to bring their ideas full-term and form viable business ventures. In theory, the term 'incubator' has been used about the activity taking place within the incubator facility. For instance, (Bergek and Norrman, 2008) referred to incubators as a tool that promotes the development of technology-based firms. (Allen and Mccluskey, 1991) elaborates further by giving a glimpse into what the incubator offers by stating that it is a facility where shared office services, affordable space, and assistance in business development are offered in an environment that is conducive to the creation of new ventures and support for their early-stage growth and survival.

Of importance to note within the definitions is that the incubators support start-ups in a bid to help them grow. (Cooper, 1985) emphasizes the incubator's role in the growth of new ventures by stating that incubators act as mentors in helping entrepreneurs start and grow businesses that, in some instances, were similar to the incubator organization hosting them. In other cases, which tended towards software development and technology, the start-ups were found to have operations and ideas that were not similar to the incubator organization, but by being in the incubator, the start-ups benefited from the technical and marketing expertise needed in running their business ventures in the absence of prior experience. Hence, from these definitions, the overall goal of incubators is to help start-ups

obtain the necessary business expertise needed to set up and grow a business venture.

The current business environment is permeated with incubators. This increase is, in retrospect, in response to the success of start-ups within the technology sphere such as Facebook, Twitter, and Instagram, which inspired the younger generation to join the technology bandwagon through start-ups, wishing to gain the same 'overnight' success as the young technology companies. These start-ups have, in most cases, been grown within incubators. Incubators, as noted in (Li et al., 2020), have also increased in numbers in recent years owing to the need for having new businesses that support economic growth in most countries.

These incubators are funded not just by private organizations and businesses but also by governments. While it is economically sound to support these start-ups to minimize unemployment, it is also still necessary to evaluate their effectiveness. (Harper-Anderson and Lewis, 2017) noted that the quality of the incubator plays a major role in the success of the start-ups it supports.

For instance, incubator qualities such as services offered, management practices, and resources are termed as key indicators determining the success of an incubator. According to (Harper-Anderson and Lewis, 2017), the services offered include legal services, help in accessing funds, shared office equipment, business plan development, and opportunities to network. The author further noted that management practices such as human capital and the manager's skill and competence level were all necessary for making the incubated start-ups a success. Not just these but also the opportunity to work was noted as crucial in helping build a network that can bolster the start-up forward in terms of resources. These networks include legal experts, financial advisors, elected officials, experts in economic development, and business leaders. Hence, it can be said that the internal quality of the incubators determines the outcomes of the businesses incubated in them.

Another question that may be asked regarding incubators is: what type of selection criteria do they use in admitting start-ups? (Thierstein and Willhelm, 2001) Give a brief description of what might be used as a selection criterion by investigating how the incubating services were offered. The authors noted that a majority of the incubators investigated (in Switzerland) operated within manufacturing, development activities, and services. Also, the facilities were offered on a space-to-rent basis, with a high-tech input level utilized. From this study, the major observation is that the types of start-ups supported must be within the three-given categorized: service, manufacturing, and development activities.

(McAdam and McAdam, 2008) also investigated the use of University Science Park Incubators in the development of High Technology Business Firms (HTBF) in respect to the lifecycles of the HTBF. Just a glimpse into this study also indicates that the incubators are specific as to which start-ups they accept for incubation, based on their business function, for instance, whether they are manufacturing, technology, or service-oriented. This notion is supported in (von Zedtwitz and Grimaldi, 2006), who noted that incubators could be categorized based on four elements of competitive scope: segment scope, vertical scope, industry focus, and geographic focus; as well as their distinct strategic objectives (whether for-profit or not for profit).

Segment scope allows for incubators to generate start-ups based on distinct sources, such as from universities, industries, or corporations. The geographic scope allows incubators to focus on geographic regions that have potential in networking, meaning that where most businesses are concentrated is where the incubator will be situated. Industry focus helps the incubators support the start-ups through expertise in the incubator manager's field of specialization, which is important in imparting knowledge to the start-up founders. From these studies, it can be deduced that different models are adopted by the different incubators in providing their services to start-ups.

This paper aims at investigating the various archetypes used in implementing incubators and

attempt to formulate a framework that can be used in defining best practices applicable to incubators. At least five incubators will be investigated, with their characteristics and distinctions observed to highlight the key functionalities, models, and structures used in implementing the incubators about the services offered to the start-ups.

This paper is structured in this way:

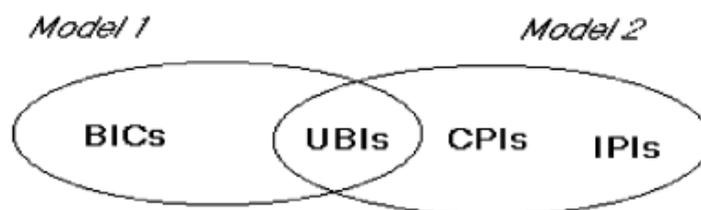
- Section 2 will discuss the various incubator archetypes in terms of their characteristics, as discussed in (von Zedtwitz and Grimaldi, 2006).
- Section 3 will outline the characteristics for creating the framework proposed in this study.
- Section 4 will discuss the methodology used in collecting, analyzing, and presenting the data.
- Section 5 will discuss the results of the data collection, as well as the application of the framework proposed in section 3.
- Section 6 will conclude the study.
- Section 7 will give recommendations for improvement in future research.

## II. INCUBATOR ARCHETYPES

According to von Zedtwitz and Grimaldi (2006), differentiated incubators are based on four major factors, as well as the basis for conducting business (for-profit or non-profit). This differentiation is what makes for the archetypes used in describing the activities and services

behind certain incubators. These archetypes are different from the description given in (von Zedtwitz and Grimaldi, 2006), and features mainly the segment scope from among the four competitive scopes defining the number of value chains a business engages in. (Barbero et al., 2013) used four archetypes to describe how some incubators fulfill the segment scope: the university incubator, basic research incubator, private incubator, and economic development incubator. (Sansone et al., 2020) described a different type of incubator, the social incubator, which focuses on start-ups that have significant social impacts, while (Peters, Rice, and Sundararajan, 2004) described incubators based on their business models: for-profit and not-for-profit. For-profit incubators involve start-ups relinquishing part of their equity to the funding organization, while not-for-profit incubators, which are mostly affiliated to universities or government agencies, do not require the start-ups to part with their equity.

How one start-up selects one model from the other depends on which one serves its purpose. (Grimaldi and Grandi, 2005) focused on incubator types based on four categories: University Business Incubators, Business Innovation Centers, Corporate Private Incubators, and Independent Private Incubators. From these four categories were found two models under which they operated. The model is illustrated in Figure 1 below:



Source: (Grimaldi and Grandi, 2005)

Figure 1: Business Model from the convergence of four categories of incubators

As the figure illustrates, the two models are a derivative from the convergence of the four incubator categories. This convergence is based on the concept of the derivative, where each of the

named incubators can make use of the best of what the other incubators provide, merge with their own, and realize new and better business models. However, this proposed business model is

not in effect but a suggestion for improving on the weaknesses presented by the four named incubator types (Hansen, Nohria, and Sull, 2000).

Also investigated the success of incubators and found that only a specific category of incubators outshines the others; the networked incubator. What distinguished the networked incubator from all the other incubators, as (Hansen, Nohria, and Sull, 2000) noted, was the presence of a mechanism through which partnerships could be fostered with other businesses to allow for a flow of knowledge and talent between the incubator firm and already established businesses.

It is this networking that connects the start-ups to the resources they need, enabling them to move faster than the start-ups that lack a network. Importantly, (Hansen, Nohria, and Sull, 2000) noted that when the networked incubator, when properly implemented, would bring together the scope and scale of large, established organizations and the spirit of entrepreneurship characterized by small venture-capital firms. In conclusion, the authors noted that it is the networked incubator model that suits the current economy that requires wealth and value creation. Another 'hybrid' incubator is presented in (Phan, Siegel, and Wright, 2005), who observed that science parks and incubators, though they exist in incubating start-ups, have no particular systematic framework that can help in understanding them and their dynamic nature, the nature of the start-ups incubated in them, and the level of success that can be attributed to them.

In all the above literature, it is observed that there are multiple types of incubators in place, each with its unique services and business model to help in delivering these services. The literature has made attempts at highlighting their operations and structures but has failed to offer insights as to their operations and performance. In this light, a gap is observed to exist. The following sections of this investigation will attempt to fill the gap by focusing on the only type of incubator category, the university business incubator, in terms of its performance.

## 2.1 University Business Incubator

University Business Incubators, as mentioned in (Grimaldi and Grandi, 2005), are public incubators mostly supported by governments to aid in research into ideas that can become viable businesses in the future. The research areas tend towards science and technology, with the universities lending the government talent, faculty time, and resources necessary for the undertaking of the research. (Mian, 1996) further noted that the University Business Incubator is a strategy used by governments to promote the development of new research and technology-based firms. (Somsuk and Laosirihongthong, 2014) extrapolated more on the operations of University Business Incubators through analyzing enabling factors that contribute to their success, specifically focusing on their internal factors.

These internal factors were identified as human, financial, technological, and organizational resources. The investigation highlighted that human resources ranked higher among the four enabling factors, followed by financial resources, organizational resources, and technological resources, in that order. Human resource factor, as explained in (Somsuk and Laosirihongthong, 2014), factors in the founding team's attributes, the business incubator's management team, and the start-up's team whose talents and expertise are needed for the success of the incubation. (Kiani Mavi et al., 2019) conducted a study that can add more weight to the findings (Somsuk and Laosirihongthong, 2014). (Kiani Mavi et al., 2019) ranking factors that impact the strategic management of University Business Incubators. The highest-ranked factor was talent managers. Generally, talent managers utilize the full spectrum of human resource practices in attracting, recruiting, onboarding, motivating, and retaining top-performing employees. The high ranking means that within the investigated University Business Incubators, the effective managing of human resources was an essential factor contributing to the success of the incubators. Hence, it can also be said that talent within the incubators is the key to success, given that it is the student's creativity and critical thinking that will develop solutions required to

solve today’s problems in science and technology. A pertinent question raised on the effectiveness of the University Business Incubators is presented in (Bennett, Yábar, and Saura, 2016).

The main argument behind this questioning is that since the government and other private institutions fund the University Business Incubators, there should be some evidence to show that the goals of these incubators are met (Bennett, Yábar, and Saura, 2016). The investigation highlighted that there was little done in terms of assessing the effectiveness of the University Business Incubation. Examples are given from other literature that indicated that while there were a few success stories from University Business Incubators, there was still a lack of clarity or proof of the cost-effectiveness and value addition of firms coming from the University Business Incubators. (Mian, 1996a) presented a different perspective on the issue of value addition, looking at it from the incubator role in providing the needed resources to the start-ups hosted within University Business Incubators. (Mian, 1996a)’s perspective included value-added dimensions of the incubator services provided, university image, student employees, and laboratories and equipment all contributed to value creation within the UBIs. Hence, the effectiveness of the UBIs is still fertile ground for further investigation.

### III. PROPOSED INCUBATOR SERVICES FRAMEWORK

It is observed from the literature that the incubators are formed based on the objectives of the incubator firms, which is also the single most important factor in starting an incubator. For instance, if a firm works within medicine, then the incubator it is likely to start is one geared towards medicine since it is the area of expertise. Other factors noted to influence incubators include funding, geographic region, and industry. This study has also highlighted that the University Business Incubator is one of the incubators included among the incubator implementation models. The UBI was selected for this study specifically as an anchor for the other incubators, given that their environment and goals tend to foster collaboration and are teeming with knowledge and talent that may be absent from other incubators (Hassan, 2020). Hence, the UBI is used as a guide in the effective implementation of an incubator service framework.

The framework is developed based on an extensive review of the literature to highlight the different services offered by incubators, which were then scrutinized for applicability in other areas and not just added to a comprehensive list. Table 1 below highlights the identified services, along with their importance.

*Table 1:* Proposed Incubator Services Framework

No	Service	Service description
1	Office space and administrative services	The start-up team would need to work together under one roof during the initial stages. Being less than one roof ensures speedy feedback and collaboration. Office administrative services include access to the internet, printers, coffee, meeting rooms, drawing boards, and equipment that will facilitate working on the start-up project.
2	Networking activities	Networking, as highlighted in the literature, is crucial for the speedy progress of a start-up. The network will provide the resources needed by the start-up to help accelerate it to the next level.
3	Mentorship	Mentors have been through a certain path and are aware of pitfalls to be avoided and opportunities to be taken. Having a mentor will bridge the lack of experience gap that is sometimes common with most start-ups
4	Connections to future capital	Most start-ups need capital to scale their business. Having future sources of capital can help in this case.
5	Partnership opportunities	Partnerships can be the ticket to a start-up’s connection to larger market segments. Hence, having opportunities for partnerships is important to include among the services in incubators.

6	Expertise	Expertise can be in the form of training, business and legal advice, knowledge transfer, technical support, as well as skills acquisition that can help fill weak areas within the start-up.
7	Business development programs	These programs are geared towards making the business better in terms of growth. Workshops and discussion panels may be possible areas to include within the business development program.

*Source: Primary*

The services included in Table 1 were viewed in terms of applicability to a wide range of incubators of varying industries, scopes, and goals. It was thought that it might not be possible to include every service being offered by each of the different incubators. It was also premised that finding services that can resonate with every business, and not just the start-ups within incubators, was the key to selecting the services to include in Table 1 above. Hence, Table 1 has considered studies such as Wiggins and Gibson (2003), Salem (2014), and Albort-Morant and Oghazi (2016) in making the list of services to include in incubators.

#### IV. METHODOLOGY

##### 4.1 Design

A research design is the techniques and methods used by the researcher in conducting an investigation. An empirical study has been selected as the research design for us in this case. The empirical study included selecting at least three prominent University Business Incubators, highlighting the key services and strategies used in implementing the incubator, and comparing these with the proposed framework in Table 1 above. This comparison was conducted as a way of analyzing how effective the services provided in these incubators were in meeting the needs of the start-ups within the incubators, based on the proposed framework.

The University Business Incubators were selected based on their geography, i.e., located within the United States. The selection criteria included factors such as having an internet presence and the services offered well described on their website since the information was being gathered firsthand from their websites. Opinions from former and current start-ups were also gathered as a way of corroborating what is presented on the UBI websites.

##### 4.2 Selected UBI Characteristics

The three selected incubators were American University Entrepreneurship Incubator, the Startup Aggieland at Texas A&M University, and the Start-up Garage at the Center for Entrepreneurial Studies at Stanford University.

American University Entrepreneurship Incubator is a University incubator that focuses on building entrepreneurial innovations and bringing them to market. Entrepreneurial courses have been taught in this school since 1980 and have grown to currently include about 300 students enrolled annually in different entrepreneurship classes.

Notable companies to spring from this incubator include UPace, a company that seeks to connect recreational facilities with clients to improve their mental and physical wellbeing.

The Startup Aggieland at Texas A&M University is a public business school in Texas. Startup Aggieland incubator is implemented as a start-up incubator, with an environment described as being open and collaborative. The incubator admits not just students but also entrepreneurs, staff, and faculty, who come together to work on their business ideas. Notable start-ups springing from this incubator include GoFresh, an online company that focuses on preparing and delivering healthy foods to its clients.

The Start-up Garage at the Center for Entrepreneurial Studies at Stanford University describes itself as ‘an intensive, hands-on, project-based course where student teams design and test new business concepts that address real-world needs. The incubator website states that there have been more than 130 companies founded by its alumni, and over 2.5 billion dollars have risen for funding by the alumni to date. Notable companies to spring from this incubator include Instagram, an online photo and video

sharing application that is used by thousands of people worldwide.

## V. RESULTS

Results of the comparison between the university incubator services and the proposed framework

*Table 2:* Comparison of Incubator services against the proposed framework

Incubator	Services						
	Office space and administrative services	Networking activities	Mentorship	Connections to future capital	Partnership opportunities	Expertise	Business development programs
American University Entrepreneurship Incubator	X	X	X	X			X
The Startup Aggieldand at Texas A&M University	X		X	X		X	
The Start-up Garage at the Center for Entrepreneurial Studies at Stanford University	X					X	X

*Source: Primary*

The results of the comparison have highlighted that the American University Entrepreneurship Incubator has most of the proposed framework services in their incubator. Only two services: partnership opportunities and expertise, are missing. However, these two are noted to mainly impact the incubator on issues such as marketing and leveraging the start-ups, as well as on individual areas that the start-ups may be weak. The Startup Aggieldand at Texas A&M University followed with at least four of the proposed framework services in place. The missing services: networking activities, partnership opportunities, and business development are noted to impact the incubator on factors such as tapping into existing markets, speeding up the start-up going into the market and obtaining resources, as well as a chance to gain knowhow of how to grow the business.

The Start-up Garage at the Center for Entrepreneurial Studies at Stanford University had the least of the proposed services within the

are presented in Table 2 below. The 'X' is used to mark the services that the UBI incubators have that agree with the framework.

framework. Areas that missed the attention of this incubator included networking opportunities, mentorship, connections to future capital, and partnership. These services are viewed to impact the start-ups on the part of scaling, exposure, and market reach. Hence, the UBI investigated here has highlighted that different incubators, even those in the same industry, have different ways of implementing their incubator business models to meet the needs of their budding entrepreneurs.

## VI. DISCUSSION

At least seven services were identified in the framework that was deemed critical to include among the services provided by incubators. All of the incubators had the basic: office space and administrative services that are common among all other incubators. However, the rest of the other factors are what can differentiate one incubator from another. Mentorship, for instance, gives entrepreneurs a chance to be guided by someone familiar with their area of interest.

A lot of mistakes and missed or miscalculated opportunities can be avoided by having a mentor. Business development is also another crucial service that can help start-ups better prepare for the growth of their businesses, moving from one point to the next. Opportunities to create partnerships are also noted to be crucial in that it opens existing markets to the start-ups, making it easier to scale at a much higher speed. Connections to future capital are also necessary where the start-ups wish to scale or when they move from the incubator to the real world and need funds to set up offices. Expertise is also crucial where the application of specialized skills is required, such as technical skills. Hence, from this comparison analysis, it can be deduced that the university business incubators still have room for improving their business models for more success to be obtained from their incubation services.

## VIII. CONCLUSION AND FUTURE STUDIES

Incubators have become important elements within the business sphere today. The current companies that have been in place for years are not enough to support the growing number of youths seeking jobs; hence, creativity must be used. Governments and private institutions support these incubators through funding. Incubators are noted to be implemented through different categories, which can broadly be classified based on four competitive scopes: industry, geographic, segment, and vertical scopes. The university business incubator was investigated in this paper, with results indicating that much still needs to be done for a comprehensive list of services to be offered in these institutions. This investigation focused on highlighting the services offered in these institutions through checking their online websites for a list of the services offered. This method is noted to be insufficient, given that more details would have been obtained if the institutions had been given interviews. However, due to the current pandemic, it was not possible to meet with the concerned parties. Hence, it is recommended that a future follow-up

investigation be conducted, this time while meeting with the incubators, for better insights to be obtained.

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