RECENT TRENDS IN INCUBATORS AND ACCELERATORS

Report submitted to Alberta Innovates

March 28, 2019

Geoff Gregson

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EXECUTIVE SUMMARY

This report examines recent trends related to incubators and accelerators that are relevant for the Alberta entrepreneurial ecosystem. Some key findings are presented below. The report summary can be found in Section 4.5.

- The importance of **tacit know-how** may explain why startups typically stay in proximity to an incubator after graduation. This suggests that geographical proximity is critical, as entrepreneurs continue to use familiar knowledge and networks to find new solutions to technological and commercial challenges.

- Access to 'soft' and accessible resources in incubators without graduation deadlines may have the unintended consequences of **delaying critical market selection mechanisms** and protecting mediocre firms.

- Successful accelerators establish an **early 'footprint'** - the network of mentors, sponsors, partners & investors that create credibility, identity & brand. This footprint has allowed leading accelerators to build a strong local base and internationalize.

- Research has demonstrated that the presence of an accelerator leads to a **shift in the general equilibrium of funding activity in a region** rather than merely to an effect on recipient ventures.

- Successful accelerators are **distinguishable by their assumptions** related to: 1) the importance of particular needs/resources for their clients; 2) the relationship of the founding environment and regional economy to clients; and 3) the role that it will play to mediate that relationship.

- Corporations have emerged as **major players in business acceleration**, with important lessons for Alberta.

- Different considerations regarding **industry and regional factors** should determine whether to establish a "generalist, industry- agnostic" accelerator or a more industry-specific, vertical-oriented accelerator.

- Incubators and accelerators **should not be considered in isolation in regional ecosystems**, and on their own, are insufficient to build strong entrepreneurial communities.

1 INTRODUCTION

The purpose of this report is to examine recent trends related to **incubators** and **accelerators** that are relevant for the Alberta entrepreneurial ecosystem. The report does not assess the performance of current or previous incubators and accelerators in Alberta. Instead, the report focuses on defining, describing and critically assessing these two modes of enterprise support for further consideration and discussion.

'Incubators' and 'accelerators' have become commonplace terms when referring to support for entrepreneurship and startup enterprises. Since the incubator phenomenon emerged almost six decades ago, different priorities and strategies to support entrepreneurs and enterprise have resulted in a plethora of business incubator models.

The effectiveness of different models has generated considerable debate amongst practitioners, policy-makers and scholars. Defining what characteristics distinguish an incubator from an accelerator has also attracted much debate.

Incubators have evolved from a real estate offering for tenant entrepreneurs to a multiple services offering which include supporting product, market and business development, facilitating linkages to investment opportunities and providing customized sector-specific support.

Academic incubators, corporate incubators and social innovation incubators have also become commonplace, with available facilities and services attempting to align with the incubator's mission and purpose.

Accelerators are a more recent phenomenon and have attracted much attention from policy makers, corporations, investors and entrepreneurs; becoming prominent in many startup ecosystems over the past decade. Debate continues on their role in regional ecosystems and impact on portfolio companies, as research evolves to evaluate the different models and to overcome data access and other challenges to their study.

The **structure of the report** is as follows.

Section 2 defines incubators, examines different incubator models, describes common activities, and considers different challenges for incubators.

Section 3 defines accelerators, examines different models, describes their activities, considers recent trends and discuss challenges to the accelerator model.

Section 4 discusses incubators and accelerators in the regional context and implications for policy, with some concluding remarks.

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2 BUSINESS INCUBATORS

It is estimated that there are more than 7,500 business incubators operating globally, with most run as 'not-for-profits' and approximately one-third associated (directly or indirectly) with a post-secondary institution. Business incubators are identified as the most popular type of economic development practice in the European Union.

The high level of public support for business incubators is justified for two reasons: 1) entrepreneurship and startup firm growth contribute substantially to net and gross job growth; and 2) with this recognition of their economic importance, startup firms are quite fragile, with approximately half of all new market entrants surviving less than five years. In the case of Canada, the greatest number of startups and failures occur in professional, scientific and technical services; areas important for innovation.[1]

Although 'incubator' has evolved into a generic term, differences in incubator models can be significant and these differences have important implications for policy and practice. In this section, we examine incubator definitions, models, activities and challenges.

2.1 Definitions

The business incubator emerged in the 1950s[2] and has undergone significant evolution over the past six decades, in terms of services offered, organizational forms, sectors of operation and value provision. This has resulted in a wide range of definitions and characteristics to describe incubators, as shown in Table 1.

Table 1: INCUBATORS: Definitions and Characteristics

Reference	Definition	Key Characteristics	Implications
Smilor (1987)	Incubator as a mediator which **transforms demand from the entrepreneurial community for services** into viable businesses	Link talent, technology, capital and know-how to encourage new company development	Presence of a local entrepreneurial base & culture is most important factor. *Without it, there is no need for incubators*
Nowak & Grantham (2000)	**Virtual incubator**: distributed human resources and a business landscape dominated by strategic partnerships with different knowledge	Most relevant for supporting ventures in the software industry, where distributed knowledge could be drawn in virtually	• Absence of interaction between incubatees is a key limiting factor • Not common & often free of charge
European Commission (2002)	**Generic term** for organizations which assist entrepreneurs develop ideas:	Physical 'incubator' environment is conducive to the cross-fertilization of	Wide range of organizations defined as 'incubators'

[1] Government of Canada (2019) Key Small Business Statistics, www.ic.gc.ca/sbstatistics

[2] The concept of an incubator is credited to a hardware store manager named Joseph Mancuso in 1956, when he converted an abandoned 850,000-square-foot manufacturing complex in Batavia, N.Y., into a new kind of facility he called the Batavia Industrial Center" (Dahl, 2011).

	from inception through to commercialization & launching of an enterprise	ideas, advice & networking	
Witt (2004)	Entrepreneurs **acquire resources from network** that would not be available via market transactions (network success hypothesis[3])		Founders gain access to resources ***more cheaply*** by using network contacts
Hackett & Dilts, (2004)	Support the creation & growth of new ventures by **providing a variety of integrated services**	• low-priced rent • shared services • support network access • entry/exit policies	**Centralized location** for provision of variety of services
Peters et al. (2004)	Provide a **'bridge' between tenant & external environment**	• business co-location • shared services • mgmt. assistance • networking	Facilitate new network access to **compensate for entrepreneurs' lack of networks**
Grimaldi & Grandi (2005)	Provide a variety of services & **reduce costs** of doing business for entrepreneurs		Multi-service provision that also reduces costs
Bollingtoft & Ulhoi (2005)	Node point for **entrepreneurs to develop relationships** with wider local, regional, national supportive infrastructure	'Bridge' between tenants and outside, in order to leverage entrepreneurial talent and/or resources	
Chan & Lau (2005)	Benefits required by technology founders at **different stages of development** are varied	General merits that are claimed by incubators as useful to technology start-ups are debatable	**Tenants should be clustered in same sector** for knowledge sharing to take place
Bergek & Norrman (2008)	**Provide management assistance**, which includes business support, advice or 'coaching'	• business-development advice • services related to general business matters	
Schwartz & Hornych (2010)	**Incubator specialization is not superior to diversified incubators** with respect to promotion of linkages of their tenants with academic institutions	Could not find support that specialized incubation strategies increased effectiveness of internal networking compared to more diversified incubators	Not all empirical evidence points in the same direction.

As suggested above, business incubation can refer to a process as well as a physical space:

Incubation:

Support process that nurtures the entrepreneur & venture in the pre-business, startup & development stages

Incubator:

Physical or virtual space that provides an array of targeted resources & services to clients, depending on the type of incubator

[3] Bruderl and Preisendorfer (1998) Network support and the success of newly founded business.

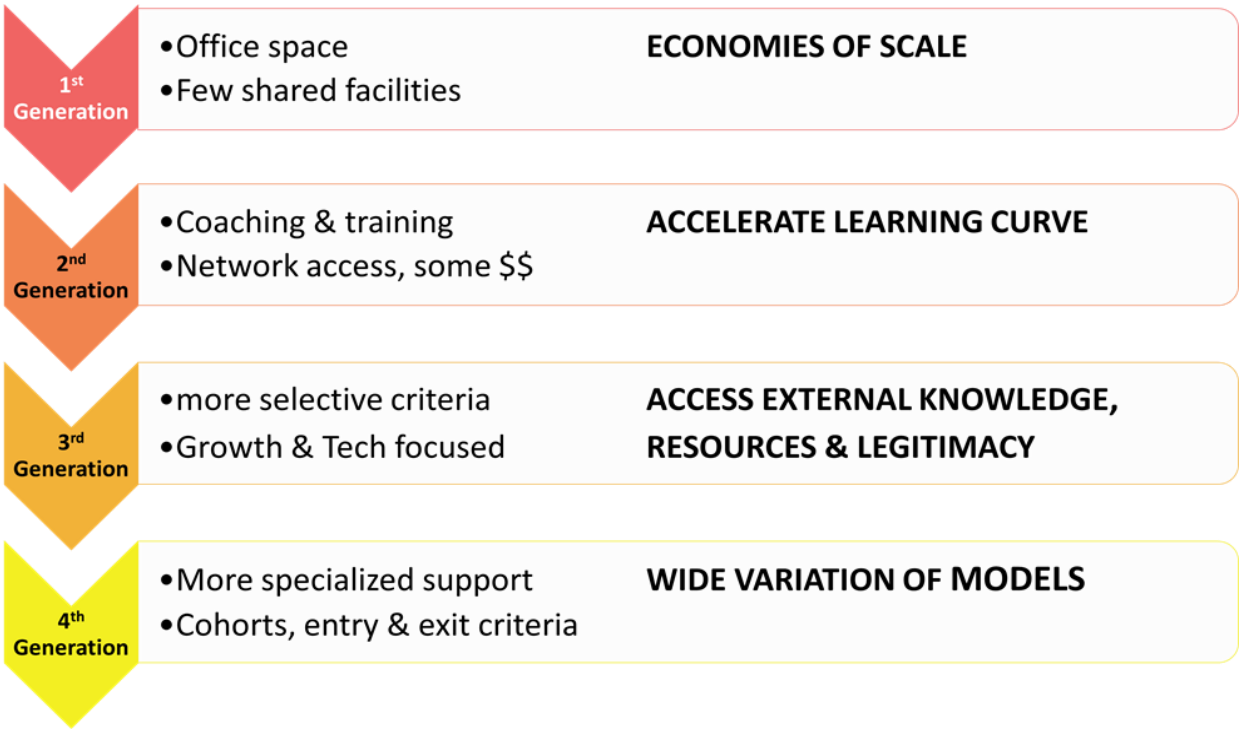
This distinction is relevant when referring to network-based or virtual incubators, which are less reliant on physical spaces in the delivery of services. The distinction is also important when observing startup support services being offered by organizations that do not self-identify or are not acknowledged as incubators.

Four different 'generations' of incubators are suggested to describe the evolution of the business model over the past six decades, as described below.[4]

- **First generation**: focus on offering tenants office space and a number of shared facilities.
- **Second generation:** in the 1990s, services were expanded to different consultancy services, network access and in some cases also venture capital.
- **Third generation:** In the late 1990s, focus more on promising startups in the ICT and high- tech sector.
- **Fourth generation**: role of the incubator has changed from just offering office facilities to one offering training, networking and consulting in all areas of expertise to new and young firms.

Figure 1 summarizes the four generations of incubator and their key characteristics.

Figure 1: Incubator Evolution and Key Characteristics



[4] Bruneel et al, (2012) The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations.

While some **second generation** incubators in the early 2000s began to provide training and coaching support, more specialized services, such as accounting, marketing and legal advice, tended to be delivered using external service providers.[5]

Few incubators at this time provided access to in-house seed and venture capital (VC) funds, partner searches, help with human-resource issues or support for recruitment.

Third generation incubators incorporated more efforts to connect entrepreneurs to the external environment. Networking was highlighted as a critical factor contributing to new venture survival and growth, in gaining access to information, advice and influence as well as resources held by others.

The **fourth generation** of incubators have a stronger focus on more specific sectors, in particular high-tech, ICT as well as targeting the most promising innovative startups.

Characteristics of incubator tenants have also changed over time. Third generation incubator tenants are typically younger, smaller and have shorter incubation periods vs. tenants in first and second generation incubators. The length of the incubation period has also be found to be much higher in first and second generation incubators.

The evolution of the incubator has produced a legacy of various definitions. However, we observe a significant shift from an original focus on value added through real estate to a more recent focus on enterprise development, more specialized support and subsequent emergence of different service-oriented incubator models.

Business 'incubation' is an *umbrella term* for a **range of support activities**, provided by a variety of organizations, not just services provided by self-identified 'incubators'. 'Incubation' also refers to a **collection of techniques** that can be used to prove an idea, develop a team and de-risk ventures for later–stage investors.

2.2 Incubator Models

With the evolution of incubators has come significant heterogeneity in incubator models; some of which we examine here.

2.2.1 Waterfall Model

Figure 2 shows the 'waterfall' model of incubation, where support provision attempts to align with different stages of enterprise development.

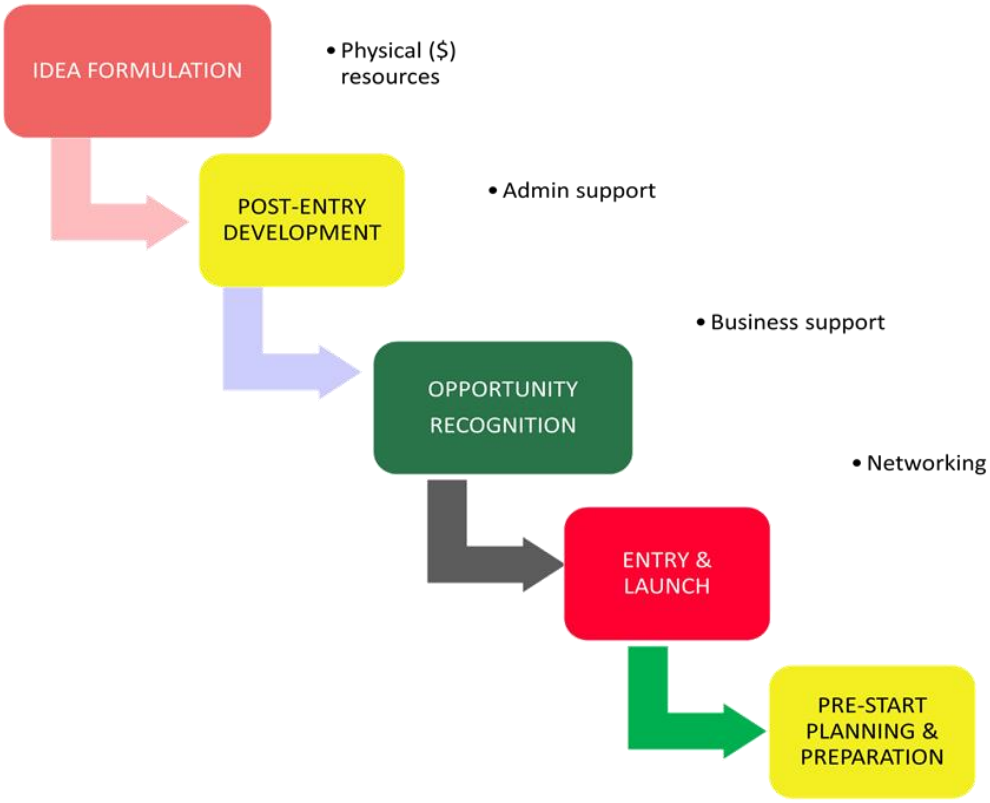
With the waterfall model, main services are delivered at each stage; which may be delivered in-house or drawn in with partnerships with other service providers. An obvious

[5] European Commission (2002) "Europe's cities - Centres of Innovation Culture.

weakness with this model is that **new venture creation is an iterative process**, whereby needs of each enterprise will ebb and flow across different stages.

However, the waterfall model can be found in a number of University-based incubators, where activities typically involve student-led initiatives supported by faculty, the appointment of entrepreneurs-in-residence, entrepreneurship clubs and networking events that draw in the external community.

Figure 2: Waterfall Model of Incubation

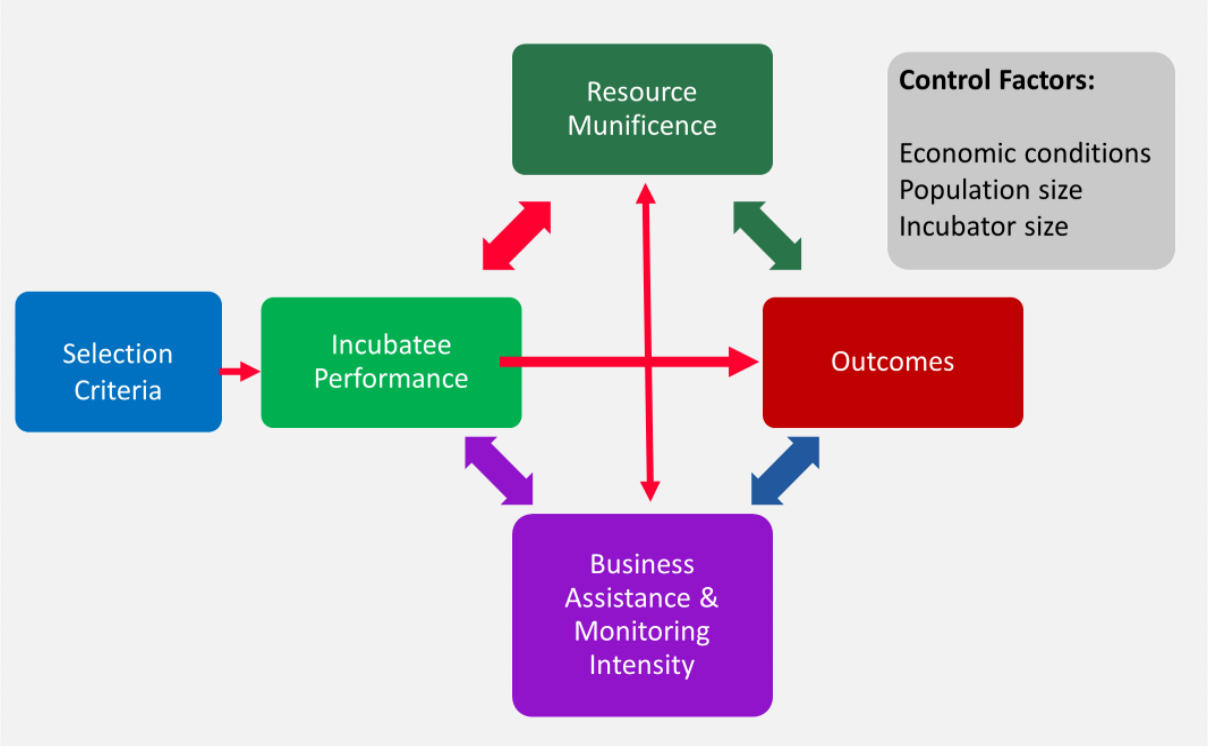


2.2.2 Input-process-output Model

Figure 3 presents an 'input-process-output' incubator model. Such incubators attempt to mediate the relationship between incubatees and their environments by creating a resource-munificent context intended to increase survival rates and achieve other objectives expected of the incubator.

While this model suggests that entrepreneurs will benefit from drawing upon a resource-munificent environment facilitated by the incubator, some studies have found that resource-poor environments may, in fact, drive entrepreneurs towards creative solutions that overcome the limitations of material inputs.

Figure 3: Input-Process-Output Incubator Model



Access to 'soft' and accessible resources within such an incubator, particularly one without a definitive graduation deadline, may also have the **unintended consequence of delaying critical market selection mechanisms.** The presence of additional support resources available for the startup, in addition to incubator supports, may lead to *support dependencies* that stunt company growth or end up supporting mediocre companies.

2.2.3 Logic Model

Figure 4 presents the logic model of business incubation; one of the most heavily referenced models in the literature. It emphasizes that the existence of an incubator does not, in and of itself, translate into the development of critical and strategic technologies embedded in the products and/or services of innovative new firms.[6]

The logic model suggests that a **lack of quality inputs**, such as capable entrepreneurs and/or critical or strategic technologies for commercialization, go a long way toward explaining why many incubators perform so poorly. It suggests that developing entrepreneurial capital is critical to incubator success, which highlights the importance of

[6] Hackett and Dilts (2004) A systematic review of business incubation research.

various antecedents in the external environment which support and develop entrepreneurial ambitions and talent.

Figure 4: Logic Model of Business Incubation

<table>
<tr><th>Antecedents</th><th>Inputs</th><th>Activities</th><th>Outputs</th><th>Initial Outcomes</th><th>Intermediate Outcomes</th><th>Long-Term Outcomes</th></tr>
<tr><td>Pre-venture Initiation Activities</td><td>Entrepreneurs</td><td rowspan="5">Incubation: New venture Development + New Product Development + Selection + Monitoring & Business Assistance + Resource Munificence</td><td></td><td>Incubatee is surviving & growing profitably.</td><td></td><td rowspan="5">Increased Organization Population Churn</td></tr>
<tr><td>Community Support for Entrepreneurship</td><td>Enabling Technologies / Innovations (including Incubator)</td><td>Incubated Companies</td><td>Incubatee is surviving and growing but not yet profitable.</td><td>Viable/Becoming Viable Companies</td></tr>
<tr><td>Exogenous Conduct of Basic Research</td><td>Critical Technologies / Innovations</td><td></td><td>Incubatee is surviving but not growing and not profitable/margin-ally profitable.</td><td>Dead/Dying Companies</td></tr>
<tr><td>Events Increasing Individual Entrepreneurial Orientation</td><td>Strategic Technologies / Innovations</td><td></td><td>Incubatee operations terminated while still in the incubator; losses minimized.</td><td></td></tr>
<tr><td>Incubator Feasibility Study</td><td></td><td></td><td>Incubatee operations terminated while still in the incubator; large losses.</td><td></td></tr>
</table>

Another observation with the logic model relates to the initial, intermediate and longer-term outcomes anticipated from incubation. With the focus on viable companies, little is mentioned regarding the spill-over effects of incubation, e.g. from entrepreneurial talent which leverages lessons from failure into new opportunity, which later models examine.

2.2.4 University Incubators

Many Universities and other post-secondary institutions have established incubators to support student entrepreneurship, incubate student/faculty startups and exploit university intellectual property (IP) via a spin-out process.

The majority of university incubators are focused on supporting students and developing students' entrepreneurial intentions. Most have some level of office space provision and rely entirely on public funding, either directly from the University or in combination with other sources of public funds. Key challenges to the success of

University incubators include: the quality of applicants, limited access to finance and poor location of the incubator.[7]

Some University incubator models, associated with University technology transfer offices (TTOs), prepare spin-out ventures using a number of milestones before a final go decision is given. This includes testing assumptions before valuable intellectual property (IP) is transferred to the venture or seed funding is secured.

UBI Global, founded in 2013 in Stockholm, provides **benchmarking for business incubators** (and accelerators) to improve their programs, become more attractive to start ups, and increase their overall efficiency. They also provide educational materials, management tools, communication platforms, and networking events.[8] Table 2 shows UBI's definitions to distinguish incubators from accelerators.

Table 2: UBI: Incubator and Accelerator Definitions

Business Incubator	Hybrid	Business Accelerator
Longer duration, 1-5 years typically	Mix of both	Shorter duration, 2-6 months typically
Quality-controlled intake of client start-ups with regular time bound exits		Quality-controlled, competitive intake of clients start-ups with regular time bound exits
Supports early stage client start-ups to become viable businesses		Fixed-term, cohort-based program providing intensive mentoring, networking & educational services, usually culminating in a 'demo-day'
Offers large array of business, marketing, counselling, financial, infrastructure and other service		Supports start-ups with product development, scaling & gaining customer traction
Often provides services for free or in exchange for program or membership fees		Often invests in start-ups or provides a stipend in return for small equity stake

In recent years, University incubators have become hubs for local entrepreneurial activity and, as such, have developed partnership agreements with municipalities, other post-secondary institutions and corporate sponsors. UBI provides an assessment of incubators and accelerators using categories that differentiate the extent of external linkages between Universities and outside partners.

The UBI comparative methodology has become an important marketing and branding tool for many programs. For the UBI World Benchmark study 2017-2018, there were 259 business incubators and accelerators from around the world who participated. Table 3 shows the 21 key performance indicators, 3 categories and 7 sub-categories used in the benchmarking process.

[7] European Commission (2018) Success and Failure Factors in Business Incubation.
[8] https://ubi-global.com/

Table 3: UBI Comparative Metrics & Key Performance Indicators

Value of Eco-system	Value for Client	Value for Program
1. Economy Enhancement:	**3. Competence Development**	**6. Program Attractiveness**
Jobs created & sustained	Services offered	In-province applications
Sales revenue	Coaching & mentoring hrs.	Out-of-province application
Graduates	**4. Access to Funds**	Sponsorship attraction
Self-generated revenue	Total investment attracted	**7. Post-Graduation Performance**
2. Talent Retention	Average investment attracted	1-yr survival rate
Client start-ups accepted	Seed funding attraction	5-yr survival rate
Graduate retention	**5. Access to Network**	High-growth enterprises
	Partners (#)	Qualified exits
	Events (#)	
	Alumni engagement (#, %)	

The use of an extensive set of metrics in the UBI rankings does raise some concerns regarding the activities expected of a University incubator and the extent to which pursuit of metrics, ongoing requests for performance data, etc. might affect services to clients.

Capturing the value in the process of program delivery, particularly through the perceptions of incubatees, is difficult to measure or capture with such metrics. As such, such metrics may miss out on ensuring a **positive incubator experience for entrepreneurs**.

2.3 Incubator Activities

In this section, we consider key activities undertaken by incubators and their anticipated benefits.

2.3.1 Selection, Recruitment and Entry

Eligibility criteria varies widely across different incubator models:

- Most incubators adopt an ongoing recruitment process (versus definitive recruitment deadlines and start dates seen with many accelerators)
- Clear, consistent entry criterion is necessary to ensure incubatee compatibility
- Applicants may be screened on the basis of their ability to persist through the early phases of entrepreneurship and gain market traction. By targeting resources to start-ups with a record of performance, incubators may increase the effectiveness of their

limited resources by facilitating market selection of viable businesses for further development.

Some incubators have no set restrictions on the period of time a company can stay in the incubator, which may be perceived as advantageous by the entrepreneur. However, there are **potential disadvantages of unrestricted time horizons.**

- Entrepreneurs risk getting used to an environment where the **conditions are 'artificial' and favorable;** reducing their ability to manage and survive outside the incubator.
- Incubators may provide a **'protected' environment,** where entrepreneurs learn to do business in a way that allows them to remain 'friends' with the incubator.

The physical location and physical proximity provided by the incubator is an important condition in **facilitating ongoing interactions and development of personal relations**. It will also have an important bearing on the types and nature of companies that the incubator manages to attract.

2.3.2 Benefits for Incubator Clients

Various benefits are identified for those entrepreneurs and ventures participating in incubators:

- ✓ Provision of a favorable support environment for entrepreneurs that **compensates for their 'liability of newness'** e.g. lack of access to financial, knowledge and networking resources.
- ✓ Assistance of nascent ventures through formation stages of the business, which can **increase their probability of survival.**
- ✓ Sheltering vulnerable ventures to **be stronger before becoming independent.**
- ✓ Provision of a **physical environment** that facilitates cross-fertilization of ideas, advice and networking – drawn from local community.
- ✓ Assisting entrepreneur in assembling initial resources and developing basic operating routines, which may **preserve startup capital and lower the threshold of initial resources** necessary to begin and maintain operations.
- ✓ Facilitating linkages between entrepreneurs and the external environment.
    - **Integrating incubator services with external provision** that collectively offers value through the incubator's particular service delivery 'process.'

There is an identified 'duality' in the role played by incubators. Incubators may allow entrepreneurs to **isolate themselves** from the environment in order to engage in formational and developmental activities without having to confront directly specific environmental threats.

At the same time, incubators allow entrepreneurs to actively **engage with their external environment** and build assets that allow for a sustainable competitive advantage. As

noted above, one of the challenges with incubation is determining the criteria which allows an entrepreneur to remain indefinitely or requires his/her departure within a time period.

2.4 Challenges for Incubators

Despite significant allocations of public funding at local, regional and national levels in the U.S. and globally, many entrepreneurship support programs have not produced significant returns.[9]

There is a **high failure rate of incubators** and heavy public subsidization, particularly in higher education incubators, that calls into question the financial viability of such programs. Israel, arguably one of the world's leading 'innovative' nations, provides substantial funding for technological startups through its Incubators Incentive Program.[10]

Incubators have been criticized for providing a 'protected' environment, where conditions are 'artificial' and favorable for a new venture and where there may be no exit pressures. The result, critics argue, is the **protection of mediocre ventures, stunted growth and lack of accountability** in achieving business development milestones.

- It is possible that firms that spent many years in an incubator may have not developed capabilities to survive without subsidized resources.

For University incubators, one identified challenge in working with start-ups and spin-outs is **evaluating the management capability of entrepreneurs** and assisting in finding management for these companies, especially when founders are scientists or technologists with no commercial experience.

- The challenge, in some cases, is actually due to the lack of capabilities of those working in the University incubator, who may not themselves have entrepreneurial or business experience necessary to advise and mentor others.

Another criticism of incubators is **use of funding as a success metric**, which may be a somewhat flawed criterion for incubators who support ventures with the potential for self-sustainability and organic growth that do not require external financing.

- A key challenge for many startups is customer validation, which is typically a hurdle in securing future financing. **Undue attention to financing may detract from focusing on critical customer validation activities**.

Measuring and evaluating incubator performance to determine their impact and value is also challenged by a number of factors:

[9] Lerner, J. (2009) Boulevard of Broken Dreams:
[10] https://innovationisrael.org.il/en/program/incubators-incentive-program

- Difficulty in **creating a control group of non-incubated firms** whose developmental outcomes could be compared to the incubated firms.[11]
- Difficulty in **comparing performance with other incubators**, given the diversity of incubator models, differing objectives and different external environmental conditions affecting incubatee success and performance.
- **Access to relevant data**. Reporting requirements for incubators is not consistent and in some cases, not transparent or forthcoming. As suggested in section 2.2.4, performance might also be driven by achievement of comparative metrics that may or may not be appropriate for generating insights on value of services to clients, etc.

A further measurement challenge is the level of heterogeneity amongst incubator programs. This is suggested in referring to Table 4, which presents an incubator typology, which identifies where different incubators may differ – in terms of gaps being addressed and objectives being pursued - which makes comparisons difficult.[12]

Table 4: Typology of Incubators

Type of incubator	Key gap being addressed	Main objective	Secondary objective	Sectors involved
Mixed	Business gaps	Startup survival & growth	Employment creation	All sectors
Economic development	Regional or local disparity	Regional development	Business birth rates, sector growth, employment	All sectors
Technology	Entrepreneurial gap	High-value entrepreneurship & innovation	Technology start-ups & graduates, university spin-offs	All or prioritised sectors
Social	Social gap	Integration of social categories	Support for minority populations	Non-profit sector
Basic research	Discovery gap	Fundamental research (e.g. blue-sky)	Knowledge transfer, exchange, protection of intellectual property	High science & technology

[11] Sherman and Chappell (1998) Methodological challenges in evaluating business incubator outcomes.
[12] Aernoudt, (2004) Incubators: tool for entrepreneurship?

3 ACCELERATORS

Over the last decade, accelerators have emerged as prominent players in many start-up ecosystems, with worldwide estimates of 3000+ programs in existence (approximately half the number of incubators). The number of U.S.-based accelerators increased by an average of 50% each year between 2008 and 2014.[13]

Many local governments are encouraging accelerator formation in the hope of **transforming their local economy** by focusing on scalable, growth-oriented ventures that can draw in external risk capital.

Accelerators have been **widely adopted by private groups and by corporations**, given that accelerators may nurture new, potentially disruptive innovations and 'investable' ventures with the potential to generate high investment returns.

As many accelerators are *for-profit* initiatives, **the accelerator environment is typically not protective**, unlike the environment for most business incubators.

3.1 Definitions

Accelerators have become an umbrella term for many programs providing a service structure of mentorship, networking opportunities and access to funding, similar to the challenge in defining incubators. In fact, accelerators have been described as a **new generation incubation model**.

Some programs that would be defined as "incubators" refer to themselves as accelerators due to the current hype around the phenomenon, while others that meet the formal definition of 'accelerator' still refer to themselves as 'incubators.' Table 5 summarizes some common definitions of accelerators.

Table 5: Accelerator Definitions

Reference	Definition
Cohen & Hochberg (2014)	Organization which aims to **accelerate new venture creation** by providing education & mentoring to cohorts of ventures during a limited time.
Isabelle (2013)	Organization which **typically offers pre-seed investment**; usually in exchange for equity. Are more closely connected to Angels & small-scale individual investors than to VCs.
Knopp (2012)	For-profit organizations designed to **bring a return on investment to their sponsors** by providing fast-test validation of business ideas, typically in fields such as mobile applications & related areas.

[13] Hathaway (2016) What startup accelerators really do.

3.2 Activities and Characteristics

A number of activities and characteristics distinguish accelerators from traditional incubators, as suggested below:

- Participating ventures are often **referred to as *portfolio companies*** (vs. incubator *'tenants'*), as many accelerators are 'for-profit' initiatives which make equity investments in these ventures.
- Accelerators want **growth that leads to a positive exit**, while the best outcome for some incubators might be slower growth, which prolongs the venture's tenant status.
- While incubators are thought to shelter vulnerable nascent businesses from the harsh realities of the real world, **accelerators force start-ups to quickly confront those realities** and determine whether the business is viable.
- Accelerators often focus on early-stage tech startups for which the **costs of experimentation have dropped significantly** in the last decade, rather than capital-intensive startups, such as spin-offs from Universities.

The emergence of accelerators has been facilitated by a **significant fall in the costs of experimentation and costs to launch a startup** over the last decade.[14] This has allowed accelerators to provide meaningful funding and assistance to their startup portfolio companies with a seed investment or stipend as low as $15k.

3.2.1 Selection, Recruitment and Entry

Common selection, recruitment and entry criteria for accelerators are suggested below:

- ✓ **Limited duration** of accelerator programs; typically 3-6 months.
- ✓ **Highly competitive selection process**: e.g.:
  - Y Combinator accepts <3% of applicants.
  - Members of the Global Accelerator Network (GAN) receive approximately 450 applications per year, and accept <2.1%.[15]
- ✓ **Cohorts or 'batches' of startups** that start and graduate together (normally around 5-10 teams per batch). Y Combinator is an outlier, with batches of 60+.
  - Selection of **small but extraordinary teams** (usually 2-3 founders per team, graduates of leading universities, possessing strong technical and business skills).
- ✓ Provision of a **stipend or small seed investment** ($26k on average; ranging from $0 to $150k), with accelerator receiving an equity stake in return, typically 5 to 7%. Some accelerators also offer a larger, guaranteed investment in the startup, in the form of a convertible note, upon graduation.

[14] Kerr et al (2014) Entrepreneurship as experimentation.
[15] Ortmans (2016) A Hard Look at Accelerators.

- ✓ **Intensive mentoring and coaching** supported by experienced entrepreneurs and investors (normally 3-4 months, 50+ mentors and aiming for 3-4 dedicated mentors per team). Co-working space, networking and other services typically provided.
- ✓ **Periodic graduations, marked by 'Demo day,'** where graduating ventures pitch to groups of investors to raise follow-on funding.

3.2.2 Benefits for Founding Teams

- ✓ Leading accelerator programs offer a **combination of previously distinct services or functions** that are each individually costly for an entrepreneur to find and obtain.[16] These include:
  - Seed investment.
  - Value added mentorship and advice.
  - Co-working or co-location with other founders and start-up companies.
  - Capital introductions and exposure.
  - Opportunity to pitch to multiple investors.
  - Network building; during and following program.

- ✓ Founders benefit from **rapid data-driven experimentation, validated learnings, and customer engagement;** all underpinned by a sense of urgency. Some programs, such as Y Combinator facilitate this with weekly or bi-weekly 'sprints.'

- ✓ Accelerators may provide a leveraging benefit with investors and potential customers. Leading U.S. accelerator programs place particular emphasis on the **value of the network of mentors and investors** that they organize and that becomes available to participating entrepreneurs/ventures during the program and going forward as alumni.

- ✓ Overall, **startups get capital early in their life cycle, benefit from intensive support and benefit from the brand cachet** when attending a leading accelerator.

Accelerator Effects on Participants
One study compared ventures that participated in *Techstars* and *Y Combinator* to similar ventures that didn't participate in these programs, but instead raised Angel funding. They found that the **accelerator graduates achieved exit (acquisition or failure) faster than their matched, Angel-funded counterparts**, due to both higher acquisition rates and higher failure rates than for angel-funded startups.[17]

[16] Hochberg, (2016). Accelerating entrepreneurs and ecosystems: The seed accelerator model.
[17] Winston Smith and Hannigan (2015) Swinging for the Fences: How Do Top Accelerators Impact the Trajectories of New Ventures?

The study also found that accelerator attendees are more likely to come from educational backgrounds that include attendance at one of the institutions in the top-thirty producers of computer science doctoral graduates. This suggests that **there is a particular "type" of background that characterizes startup founders** that choose to attend (or are accepted to) premier accelerator programs.

3.2.3 Benefits for Investors

Investors are attracted to accelerators for a number of reasons, which include:

- ✓ **Opportunity to invest in highly scalable startups** in exchange for equity (average around 6% equity for $20K for startups seeking product-market fit).

- ✓ Accelerators serve a dual function as '**deal sorters' and 'deal aggregators'** for investors, who often serve as mentors, and are able to assess different start-ups; their business plans, team dynamics, and progress during the program.
  - Investors are able to streamline the scouting process to take bets on emerging technologies arising from different accelerators.
  - Ability to invest in accelerator funds (see below).

- ✓ Pitching events, or demo-days, allow investors to **assess multiple startups in one setting**, and potentially look at other investment opportunities when travelling to the event from afar:
  - The potential **reduction in search and sorting costs** for investors performed by accelerators may be a **particular benefit for attracting investors into smaller regions**.

Accelerator Funds
Accelerator funds are **structured as a limited partnership**, similar to VC funds, with investment raised either from a single cohort or a small number of cohorts. However, investors are typically VC funds and Super Angel investors, rather than the typical institutional investors (pension funds, endowments, etc.).
Investors should expect not to see a return directly from the accelerator fund for many years. Given that accelerators are unable to participate in large follow-on investment rounds raised by their portfolio companies, **these positions may be severely diluted by the time a portfolio company reaches exit.** As a result, some accelerators do not take equity stakes in the companies at all (e.g., MassChallenge).

3.2.4 Regional Benefits of Accelerators

Accelerators are more likely to be founded in regions that have higher levels of startup investment activity or have experienced swift growth in that activity, as evidenced by the recent expansion of TechStars into Stockholm, Oslo, Berlin and Toronto.

Accelerators, by design, may **lower the search costs for both entrepreneurs and investors seeking early stage investments**. This suggests that accelerators may stimulate an increase in the level of seed stage investment activity in a region. Reallocation of investment dollars and firms to a region may be highly acceptable outcomes for the local officials and business people that help found accelerators.

Accelerator Effects on Regional Investment
Research in the U.S. has demonstrated that the presence of an accelerator leads to a **shift in the general equilibrium of funding activity in the region** rather than merely to an effect of treatment on the treated. This suggests that an accelerator program may serve as a catalyst to draw attention to the region more generally or may serve to galvanize local activity.[18] This finding emphasizes the need to consider regional effects more generally rather than limiting analysis to comparing treated start-ups to untreated startups.

It is **unclear what ecosystem elements must already be in place** in order for accelerators to be effective or what the nature of programs must be to have the desirable effects. Future research may shed more light on the types of regions for which accelerators can be particularly impactful and the types of program elements that are most effective. We discuss this further in section 4.

3.3 Accelerator Models

Many leading accelerators are defined as '**seed accelerators**,' and as described in section 3.2, are distinguished by supporting exceptionally promising founder teams; recruited as cohorts for an intensive short-term period of support and mentoring, with graduation culminating in a pitching event to investors or "Demo-day'.

- The first recognized seed accelerator, **Y Combinator,** was established in 2005 in Cambridge, Massachusetts, and has been a source of inspiration for many accelerators to follow. Y Combinator has seen some significant high-value startup successes, including Airbnb, Dropbox, and Heroku.

[18] Hochberg, (2016). Accelerating entrepreneurs and ecosystems: The seed accelerator model.

Y Combinator, although created in Cambridge, MA, relocated to Silicon Valley and has adopted an approach of **drawing founders to the California startup ecosystem** and not following an expansive model common with other leading accelerators such as Techstars.

- **Techstars,** one of the largest accelerator programs to emerge, followed in 2007, when two local startup investors in Boulder, Colorado founded an accelerator in the hope of transforming the Boulder startup ecosystem. This model sells itself as a **builder of urban/regional startup communities**.

- The **Global Accelerator Network** (GAN) is a selective international umbrella organization for accelerator programs who count 100+ accelerators in 100+ cities on 6 continents.[19] GAN has established a set of entry standards and guidelines for accelerators that seek to join the network. Guidelines include:

  - Operate a 3-6 month long program.
  - Provide a level of seed capital to founders.
  - Take a small amount of equity (~6%) and have favorable terms for entrepreneurs.
  - Take no less than 5 and no more than 12 companies at a time.
  - Surround those companies with 40-80 mentors.
  - Have funding for a two-year runway of their program.
  - Have physical space available for their program.
  - Have a strong management team who are proven entrepreneurs.

3.3.1 Vertically Integrated Accelerators

Recent years have seen a **transition toward industry specialization**, primarily in industry verticals characterized by specialized knowledge or regulation, such as health care, energy and hardware. Some accelerators were created on a vertical, such as **Healthbox**, launched in 2010 as one of the world's first healthcare-focused accelerators.[20]

Other accelerators have specialized in hardware. **Hax** is the world's first and largest accelerator focused solely on hardware startups and is based out of Shenzhen, China and San Francisco.

Highway1, based out of San Francisco, is a corporate accelerator with PCH, a global custom design manufacturing company. Highway1 mentors hardware startups on mass manufacturing, go-to-market (GTM) strategy, and inventory risk management. Startups benefit from access to an extensive network of PCH connections.[21]

[19] https://www.gan.co/
[20] https://www.healthbox.com/
[21] http://highway1.io/

In practice, however, an examination of the accelerator portfolio companies suggests that both generalist and specialist programs shared a **common tendency toward software and services startups**, regardless of whether they generalized across the industries those start-ups were to serve or specialized in a specific industry, such as health care IT.

Traditionally agnostic accelerator programs, such as StartX (described below), now offer wet-lab space and draw in **life sciences-related startups** to their program.

Given the higher capital requirements and longer development timeline for these types of startups, it remains to be seen whether these new accelerator programs will succeed in fueling a boom in these fields similar to the one observed in software and apps over the last decade.

At the same time, the emergence of life sciences-oriented programs and other specialty programs may stimulate a shift in bargaining power and resource acquisition for these verticals in the future, **given the high potential value of their innovations**.

Vertical Integration into Seed Funds

With the proliferation of accelerators, older, established programs are evolving their models, with some vertically integrating and adding seed funds along with their accelerator cohort model. Accelerators are also leveraging their access to information on startup opportunities more broadly to invest beyond their graduates. Two examples are:

- **Techstars Ventures:** operates seed and Series A stage funds and invests in Techstars graduates as well as companies started by Techstars alumni and mentors.

- **500 Start-ups:** operates a number of funds focused on different geographical areas. Invests in their accelerator graduates as well as other seed-stage companies.

Accelerators such as **Y Combinator** are also focusing more on seed funding, while retaining a cohort- based approach, but with less emphasis on the 'boot camp for startups' rigor that was once more prominent. They now offer 'Startup School' - a free online course for founders pursuing their own startup.[22]

RockHealth, a pioneer in digital health-focused business acceleration has similarly moved away from their original model of accelerator and now describe themselves as a seed fund doing "Full Service Start-up Funding."[23]

[22] https://www.startupschool.org/
[23] https://rockhealth.com/

3.3.2 Corporate Accelerators

The emergence of the corporate accelerator can be traced to the need for many companies to **expand their innovation capabilities to remain competitive while reducing the high costs of in-house research and development** (R&D). Accelerators provide an opportunity for corporates not only to see what is emerging in new technology areas but also to shape the development and reap the rewards from the development of new innovations.

Corporates typically **set up or invest in accelerators** for reasons that include:

- ✓ Rejuvenating corporate culture and stimulating an entrepreneurial mindset among its employees.
- ✓ Creating or revitalizing an innovative brand that attracts customers, business partners and future employees.
- ✓ Solving business problems quicker and at lower risk.
- ✓ Expanding into future markets by accessing new capabilities or channels and opening up the development of new technologies (i.e. *open innovation* model).[24]

Corporate involvement can also **benefit the participating startups** by giving them access to, and potential business opportunities with, major players in their field.

There are a number of ways that corporations are participating in accelerator activities:

1. Corporations and their executives engage with an existing private accelerators as **mentors or investors**.

2. **Corporations contract with others to operate their accelerator**. In this model, the outside 'powering' organization provides services that include program design and development, management, staffing, marketing, and physical space where requested. The most prominent organization engaged with corporations in this regard is **Techstars,** which has a number of notable programs with corporations that include[25]:
    a. Disney Accelerator.
    b. Barclays Accelerator.
    c. Sprint Accelerator.
    d. Kaplan EdTech Accelerator.

3. Corporations may create their own internally run and led accelerators, as is the case for Microsoft, Telefonica, and others.

[24] Mocker et al (2015) Winning Together: A Guide to Successful Corporate-Startup Collaborations.
[25] http://www.techstars.com/corporate-innovation-programs/

4. Corporations may choose to partner with other companies to create a jointly run dual or multiple partnership accelerator. Wesley Clover International (WCI), based in Ottawa, ON, runs such a consortium model. A case study of the WCI accelerator and incubator programs can be found in **Appendix A** of this report.[26]

Shifting Funding for Accelerators in the United Kingdom (UK)
The seed accelerator model is known for providing deal-flow and venture-style returns for seed funds. However, whilst VC funds were responsible for most of the early accelerators, research shows this has now changed considerably. UK accelerators are **now most commonly funded by corporates**, including corporate VC units (51%). Examples include: Barclays Eagle labs and Barclays Accelerator, Microsoft Ventures, Wayra (O2 Telefónica) and JLAB (John Lewis). Public funding was also reported as having been received by a large number (41%) of accelerators.[27]

3.3.3 University Accelerators

University accelerators have proliferated along with corporate accelerators, with different variations of governance and structure, e.g. university-managed, university-affiliated, etc.

Examples in Canada include:

- DMZ (Ryerson University); also in partnership with SETsquared (UK).
- York Entrepreneurship Development Institute (York University).
- TEC Edmonton (University of Alberta).
- Entrepreneuriat Laval inc. (Laval University).

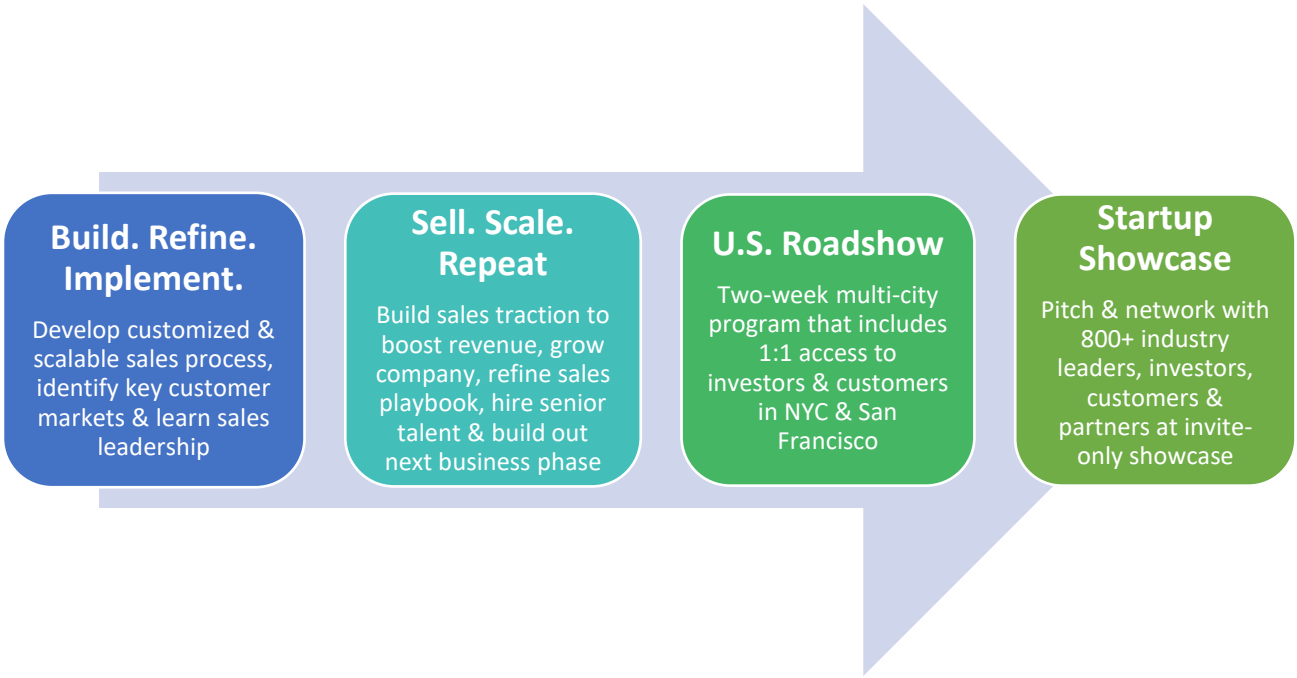
The DMZ at Ryerson University is one of Canada's largest incubators for emerging tech startups. The DMZ is open to all startups that meet its criteria. Startups must 1) address an important economic or social problem; 2) make innovative use of technology; and 3) have a prototype (at minimum) that is in the market or is ready to launch.

Over the past eight years, it has graduated 383 startups, which had raised over $560 million in seed funding. Their program is four-months long and their facility offers 40,000 square feet of space in the centre of downtown Toronto.

The DMZ is built on four program cornerstones, which are **coaching, customers, capital and community**. Figure 5 presents the DMZ accelerator road map that highlights key activities over the four-month program.

[26] https://www.wesleyclover.com/blog/l-spark-accelerator-program/
[27] Bone et al (2017) Business Incubators and accelerators: the national picture.

Figure 5: DMZ Growth Accelerator Road Map (4 months)



Leading University accelerators in the U.S. include:

- StartX (Stanford University).
- SkyDeck (University of California, Berkeley).
- Global Founders Skills Accelerator (MIT).
- New Venture Challenge (University of Chicago).
- OwlSpark (Rice University).
- RedLabs (University of Houston).

StartX is a non-profit organization whose mission is to accelerate the development of Stanford University's top entrepreneurs through experiential education. Created in 2011, its program cornerstones are **community, mentorship, education and partners**. The sectors of interest include consumer and enterprise IT, medical and hardware.

StartX has raised over $700M, with an average of $3M+ per company funding rate and draws from leading investors such as Greylock Partners, Andreessen Horowitz, and Founders Fund. The pool of mentors is drawn from 200 serial entrepreneurs, experts, angels and VCs, including individuals from LinkedIn, Google, Twitter, Genentech, Johnson & Johnson, Kaiser, and others located in Silicon Valley.[28]

[28] http://startx.com

3.4 Recent Trends

As suggested above, accelerator models continue to evolve, and established accelerator brands are transitioning into other models. Accelerators like StartupYard continue to reposition themselves as important gateways for specific kinds of companies.[29]

While most accelerator programs have a single location and run one to two cohorts each year using the same managing directors and mentors, an emerging phenomenon is the **franchising of accelerator programs** to multiple locations with different managing directors and mentors for each location.

Prominent among these groups is:

- **Techstars,** with programs in Toronto, Austin, Berlin, Boston, Boulder, Chicago, London, New York City, Seattle, San Antonio (Techstars Cloud) and Oslo (Techstars Energy Accelerator with Equinor).
- **Healthbox,** with programs in Chicago, Miami, and Salt Lake City.
- **500 Start-ups**, with programs in San Francisco, Mountain View, and Mexico City.
- **Dreamit**, with programs in Philadelphia, New York City, Austin, and Baltimore (Dreamit Health).

A second noted trend, seen with some accelerator groups, has been to transition their programs from the accelerator model into a model of business incubation. For example, **Capital Factory** in Austin, Texas, a highly ranked accelerator program, changed its business model a number of years ago to one of incubation, rather than the fixed- term, cohort- based boot camp approach of an accelerator.

Similarly, **Amplify LA**, a Los Angeles- based program, has chosen to abolish strict entry cohorts or an established timeline for acceleration for some of its companies; instead admitting companies for undefined lengths of time and referring to itself as an incubation program. Some transitions have been driven by funding considerations (see section 4.4).

3.5 Challenges with Accelerators

Despite the recent proliferation of accelerators, **determining their contributions and impact** is made difficult for a number of reasons.

- General absence of large-scale representative data sets covering accelerator programs (similar to the challenge with incubators).
- Difficulty in observing or collecting data on program features, the identity of ventures entering and exiting programs, or those ventures that apply but are not admitted:

[29] https://startupyard.com/accelerator-in-the-21st-century/

- Most accelerators are small, lean organizations, with limited staff and little organized data tracking.
- Accelerator participants are typically small private companies, often unincorporated at the start, for whom little data is available even if their identity were known.

Some programs encourage their graduates to report to publicly available databases such as CrunchBase, and other start-ups voluntarily report or are identified through CrunchBase's own data collection efforts. Other programs discourage public reporting for competitive reasons.

Many publicly available resources are aggregated by Seed-DB (www.seed-db.com), which promotes itself as a database of seed accelerators and their portfolio companies. Seed-DB itself, however, offers a number of disclaimers, including the fact that the data is incomplete. Seed-DB also notes that it draws data from CrunchBase and, thus, relies on companies to update their information in that data source, which does not always occur.

For many accelerator programs, no data is available on the nature of the program or the companies that have graduated. Despite these limitations, Seed-DB represents the largest public repository of accelerator and graduate data.

More recently, the **Seed Accelerator Rankings Project** collects detailed data in order to produce an annual published ranking of accelerator programs throughout the U.S. on a variety of outcomes of interest to entrepreneurs (http://seedrankings.com/). As more data becomes available, this is expected to become an important resource for better understanding accelerators.

3.5.1 Challenges in Establishing a Successful Seed Accelerator

Various challenges in establishing a successful seed accelerator are identified that should be considered when adopting an existing or establishing a new accelerator model.[30]

- **Poor Deal Flow:** Successful accelerators have a large number of qualified applicants to choose from, and draw interest from a global applicant pool. Newly established accelerator programs should aim to generate 100+ applicants per batch. Top programs have long timelines to market, recruit and select the quality teams on which its reputation will be built.

- **Unable to Attract the Best Startup Teams:** Unsuccessful programs have difficulty in attracting the best teams and competing with the top accelerator programs. Geography matters, as the top programs are typically located in leading

[30] Global Corporate Venturing (2016) Why most Start-up Accelerators Fail?

entrepreneurial cities, e.g. London, New York, San Francisco, Berlin, Stockholm, etc. However, other factors may strengthen a location's attraction, including the quality of the accelerator's selection process (see below).

- **Lack of Strict and Streamlined Selection Process:** Successful accelerator programs have a funnel that is effective in selecting great teams and efficient in streamlining the process (i.e. avoiding lengthy due diligence on every applicant). The selection process should establish and maintain high selection standards, including avoiding single founders or a bias to local teams and those well known by accelerator management.

- **Absence of a Competent Accelerator Team:** Successful programs require experience in marketing, operating and managing an intensive support program that involves multiple stakeholders: founders, mentors, investors and the wider community. Recognized coaching and advising expertise will also be critical. The credibility of accelerator management to this diverse stakeholder group suggests effort be made to draw in industry rather than public sector members for the team.

- **Failure to Attract Top Entrepreneurs as Dedicated Mentors**: Establishing a strong mentor network appears critical in attracting the best startups and drawing in investors. Mentors need to be highly motivated to provide value to teams and the accelerator team needs to establish a well-structured program to keep them engaged. Programs that fail attract experienced people with specific domain expertise, or theoretical academic knowledge, but who lack the entrepreneurial experience, lessons and networks.

- **Failure to Build a Large Active Investor Network:** Unsuccessful programs fail to establish an investor perspective within the accelerator at the outset and are only able to attract small groups of investors to the pitching event/demo day. Demo Days should provide a major investment event and attract active and serious investors.

    - E.g.: Patient capital for deep-tech, projects with social impact and long gestation periods are difficult.
    - Exit options for early stage investors are limited.

- **Failure to Establish a Loyal and Giving Alumni Network:** Successful programs begin with successful graduates that provide the foundation for a valuable alumni network. These founders provide opportunities for subsequent cohorts of founders, in terms of advice, connections and access to key people.

- **Lack of a Clear and Measurable Strategy:** Accelerators require clear strategic goals that guide operations and provide measures of performance and success. Measures may include:

    - Program satisfaction of participants.
    - Startup survival and growth post-graduation.
    - Average amount of funding raised per startup.
    - Number of exits and levels of valuations.
    - Number of successful graduates returning as mentors, investors, etc.

- **Lack of Vertical Focus or Specialization:** With a crowded market for accelerators, greater specialization or a vertical focus may be beneficial for the following reasons:

    - Mentors and accelerator teams with deep domain expertise are better able to provide their startups with relevant advice and networks.
    - Accelerator can develop a reputation for connecting their startups with the industry that they are seeking to enter and build a network of trust in the vertical.
    - A chosen vertical should align well with the local investor and mentor networks.
    - Venture investors that focus on a particular industry tend to outperform their more diversified peers.

3.5.2 Research on Accelerators

Understanding the role and efficacy of such programs is particularly useful for policymakers **considering the benefits of accelerators for the local entrepreneurial economy and ecosystem**, given the importance of entrepreneurial activity for economic growth and the desire to stimulate such activity.[31]

Accelerator programs **specifically address outcomes with clear societal interest**: startup activity, including VC funding and support for new ventures; science, technology, engineering, and math (STEM) employment; and regional economic development.

- These outcomes are all considered critical to the increased economic competitiveness (of Alberta and Canada) over the long-term.

Policymakers often face the question of **which type of intervention** should receive allocation of scarce funding dollars. While accelerators appear to have an impact on the entrepreneurial funding environment, other types of interventions may also positively impact funding availability.

[31] Haltiwanger et al (2013) Who creates jobs? Small versus large versus young.

- Further research is needed to determine, on a value-for-money, dollar-for-dollar basis, which types of interventions are most beneficial.

While evidence suggests that accelerators impact early stage financing in a region,[32] it would be useful to **explore other elements of the entrepreneurial ecosystem that may be affected by the establishment of an accelerator**.

Further research is also required to assess **which types of programs or program elements are most important for the success of an accelerator**, both from the perspective of the entrepreneurs that attend it and from the perspective of local policymakers or business people looking to establish a program.

- **What measure(s) of success will be prioritized**, as the definition of 'success' may differ, based on reporting metrics, goals of accelerator founders, etc.?

More research is needed to understand what interventions add the greatest value for which types of startups.

- Value will be added through building social capital (e.g. building connections, credibility), structured accountability (e.g. mentors holding founders to their plans),[33] peer learning (e.g. collaboration and competition within cohort), and through mentor and director expertise.[34]
- It also seems important that programs are not too intensive but allow time for start-ups to put learnings into practice.

Other questions are outstanding on the role and value of accelerators, such as the importance of providing direct funding, the value of co-locating startups in the same building, and what makes good mentorship.

[32] Hochberg, (2016).
[33] Gonzalez-Uribe and Leatherbee (2016) The effects of business accelerators on venture performance: evidence from start-up Chile.
[34] Hallen et al (2016) Do accelerators accelerate? If so, how? The impact of intensive learning from others on new venture development.

4 REGIONAL & POLICY CONSIDERATIONS FOR INCUBATORS & ACCELERATORS

This section of the report considers incubators and accelerators in the regional context, discusses potential implications for policy and practice and presents conclusions.

4.1 Market Intervention and Public Support

Many incubators are **heavily reliant on public support**. In acknowledging that market failure prompts program and policy intervention by government, this would suggest that high risks and high failure rates associated with startups justify intervention through various forms of public support for the startup community. Further, if the potential return from a startup is uncertain, private institutions are unlikely to be willing to absorb the costs and risks associated with supporting it.[35]

This same logic holds true with early stage technology commercialization, where risks and costs are too high for the private sector to play a dominant role. Public support is expected to complement a technology transfer objective **to accelerate the 'learning process' for emerging ventures in a region** and to promote an 'innovative milieu' and regional benefits by generating a high-density of fast-growing enterprises.[36]

This suggests that adoption of existing - or design of new - incubator (or accelerator) programs receiving public support should begin with **acknowledgement of a market failure and clear evidence of a gap in existing support provision**, which highlights the importance of particular resources, the relationship of the founding environment to startups and the role that the incubator/accelerator must play to mediate that relationship.

The Israeli Incubator Model

We consider the case of Israel, whose government has played a major role in economic growth through development of its industries and technologies. The Israeli 'business model' is described as being founded on intensive R&D, on product innovation, on U.S. venture capital and on acquisitions by U.S. companies.[37]

Approximately 117 companies from 21 countries have opened up R&D centers in Israel since 2014; attracted by Israel's extensive technological capabilities in various sectors and by an ecosystem comprising over 6,000 startups.[38] The Israeli technological incubator program is a key feature in their startup ecosystem and is described below.

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[35] Dee et al (2011) Incubation for Growth.
[36] Clarysse et al (2005) Spinning out New Ventures: A Typology of Incubation Strategies from European Research Institutions.
[37] Breznitz (2007) Innovation and the State: Political Choice and Strategies for Growth in Israel, Taiwan and Ireland.
[38] https://finder.startupnationcentral.org/

Israel's Technological Incubator Program
Israel's prolific level of startups to commercialize R&D outputs has been influenced by an aggressive public technological incubator program (TIP) which commenced in the early 1990s.[39] The primary goal of TIP is to increase Israel's annual exports, with recognition that **startups must be globally oriented**, given the small size of the Israeli market. Licensing of intellectual property (IP) is also expected, with Israel amongst the global leaders in patent filing.
Since 2011, **TIP incubators have been privatized but still offer government financial incentives**, which include grants or loans that include 85% percent of the startup budget, or up to US$145k annually for two years. If the project is unsuccessful, entrepreneurs are not required to pay anything back.
There are 18 two-year incubators for tech startups and one three-year incubator for pharma startups. Each houses eight to 15 companies rent-free. Incubators are pre-seed or seed funds managed by a team, offering US$0.5 to $2.5 million to each startup. The incubator privatization process has resulted in an increase in participation of private investors, with over US$4 billion invested in incubator companies by 2013.[40] This suggests that **private accelerators can provide an early vantage point** in terms of investment opportunities for risk capital investments.

Israel's start-up success and technological leadership can also be attributed to its venture capital model. The Yozma program, created in 1993 with a US$100 million government-owned fund-of-funds, invested $80 million in ten private VC funds, with $20 million in the Yozma Venture Fund owned by the government.[41] An important goal of the Yozma program was to **provide Israeli fund managers with experience and knowledge through partnering with foreign VCs**. As such, it differs from countries such as Canada, which has adopted more of a government venture capital (GVC) model.[42]

A key criticism of the Israeli startup model has been the **lack of Israeli companies growing to scale**. A recent trend has been for multinationals to buy Israeli companies and turn them into R&D branches.[43] This in turn has created a competition for talent between multinationals and startups, who require new talent to scale-up.

The government-funded **Israel Innovation Authority** (IIA) has redirected its support away from multinationals seeking to acquire local startups, and towards **assisting Israeli companies on the brink of maturity**. The IIA has earmarked more than $200 million in loans and grants to help growing companies avoid the 'valley of death' period when they

[39] Avidor (2011) Building an Innovation Economy: Public Policy Lessons from Israel.
[40] Israel Innovation Authority, http://www.matimop.org.il/about_authority.html
[41] Teubal (2013) Promoting High Tech Entrepreneurial Systems: Reflections on the Israeli Experience.
[42] Gregson (2018) Critical Perspectives on SME Funding in Canada.
[43] Rosenberg (2018) Israel's Technology Economy: Origins and Impact.

have a working prototype but, faced with the challenge of moving to full market deployment, often seek to be acquired or become heavily diluted.

The IIA focus is on **developing 'complete companies'** that keep their intellectual property in Israel and employ a range of talent in functions other than R&D; some of which may be outside of Israel. Complete companies develop production centers, business units, factories, etc. that create a multiplier effect that benefits a value chain of suppliers, subcontractors, outsourcing activities, support staff, and ancillary services.

Isolated activities such as R&D, or extensive startup activities, do not create the spill-over effects and economic contributions that complete companies can, as acknowledged by the IIA. This raises the question whether **incubators or accelerators are best placed to provide scale-up support to develop *complete companies* in a region**?

Supporting Startup *Scaling*: Incubators or Accelerators?
Technology entrepreneurs tend to become overly preoccupied with the product and core technology, which is often at the expense of building a broad vision for growth, even after achieving a product-market fit. Supporting startups to scale requires **developing a founding team's business acumen to build a company**, not just the technology, to set 3-5 year growth aspirations, build a product pipeline, develop sales and marketing capabilities, etc.
Local investors in the seed stage may be a better fit for startups, by providing just enough capital, less ownership dilution and more hands-on support. External capital (e.g. VCs) will typically invest at higher valuations, with greater pressure on startups to hit larger milestones, pursue larger outcomes and potentially move (often to the U.S.). The decision on when to bring on external financing is an important and strategic one.
As startups begin to scale, entrepreneurs **need access to mentors that can deliver contextual insights and ask tough questions**. Further questions may include: how will you support growth in your human capital? How do you prove the unit economics to justify raising a growth round to expand more rapidly? How will you strengthen your market position, e.g. through innovation, partnerships, acquisitions, etc.?
Startups often suffer from '**premature scaling**,' which can include hiring too many people in anticipation of market demand, focusing too much on acquiring users before a product is ready for launch and raising too little money from investors.[44]
Building a 'complete company,' based on the Israeli case, may require the startup to move into a large market early, partner with U.S. VCs, continue to lead the company through the mid-to-late stages, and focus on building an organizational culture.[45]

[44] Marmer et al (2011) Startup genome report extra: Premature scaling.
[45] Bussgang and Stern (2015) How Israeli Startups Can Scale.

4.2 Industry Effects

The resources available to new organizations are scarce, and thus the environmental resource dependencies that most new businesses face can be severe. The **founding density of their environment** determines the type of resource dependencies that startups face, and as such, it also suggests roles for incubators and accelerators in absolving such resource dependencies.

The **competitive conditions under which new businesses are founded** may also have both immediate and lasting effects on their survival, thereby influencing the effectiveness of incubators and accelerators.

Often, the **choice of admission criteria** is predicated on the preferences of the accelerator's founders rather than the underlying industry specialization of the region.

- Some accelerators select early stage firms that are broadly representative of the industry mix in their region.
- Other accelerators consider themselves generalists and select teams that they perceive to have the most potential, agnostic to industry.

There is a **wide variation in the level of accelerator specialization across regions with a high degree of industry cluster specialization**.[46] While accelerator founders often discuss building connections between industries in their region, not all industry clusters may be equally amenable to building relationships with entrepreneurial firms.

Accelerators should be complementary to the other resources in a region specialized for small and new firms. Thus, we would expect to see heterogeneity in the treatment effect of accelerator founding on a region based on the underlying industry structure of the region overall.

As well, accelerators may alter the relationship between survival of new ventures and their founding environment, but their effectiveness depends on whether provided services meet venture needs **associated with particular environmental pressures of an industry at founding.**

The impact of both incubators and accelerators will also be influenced by their **effectiveness in connecting new ventures with external resource providers and local firms**, including corporates, as discussed below.

Corporate Sponsorship

Corporate accelerators, discussed in section 3.3.2, have the potential to influence resource availability for local start-ups, increase levels of industry innovation and contribute to the regional ecosystem. Corporates and startups appear to have

[46] Delgado, Porter and Stern (2014) Clusters, convergence, and economic performance.

complimentary needs that favor engagement: the former being very good at scaling but weak on innovation and the latter being very good at innovation but weak on scaling.

Corporations have been found to manage accelerators via one of two distinct processes: namely, **accelerating strategic fit or accelerating venture emergence**.[47]

For many corporates, startup innovations need **to strategically fit with corporate needs and requirements.** Startups pursuing **unconventional innovation** (i.e. potentially disruptive but higher risk) may be particularly attractive to corporate sponsors. As such, corporates may be less interested in ensuring startup development and viability if directly applicable corporate value is not forthcoming.

For other corporates, while nurturing innovations for their own needs is important, they also **nurture ecosystems and accelerate venture emergence**. The Techstars corporate acceleration model is one such example.

Corporate sponsorship will be influenced by **the level of shared risk it is willing to take**. For example, **within the corporation**, those ultimately responsible for adopting and operationalizing a new technology within a business unit may be unwilling to share the risk with those engaged in corporate venturing activities, particularly if most costs and risks will be incurred by the former.

Externally, sharing risk with a proven accelerator model and/or with public funders may allow corporates to engage in a broader mandate to support new venture emergence and contribute to the industry ecosystem; seen when corporates invest in pilots and trials.

A critical milestone for technology startups is the **development and piloting or trialing of a prototype.** A commitment to a paid pilot is often a trigger for the corporate to make an investment in the startup.

Incubators and accelerators, particular those that support engagement between startups and corporates, should have expertise in facilitating industry-relevant **prototyping and piloting processes**. Further insights are presented below.

- Corporate sponsors may prefer startups to be graduated or close to growing out of an established incubator or accelerator program (in the absence of a corporate accelerator). Startups should be ready for pilots or field trials immediately or, shortly after graduation.

- Corporate sponsors should be engaged early on, so that they can **evaluate the fit with their relevant technology agenda** (or that of a client's technology agenda). The startup needs to understand the sensitivities of the potential adopter, while the corporate can work with the startup to make sure it can be successful.

[47] Shankar and Shepherd (2018) Accelerating strategic fit or venture emergence: Different paths adopted by corporate accelerators.

- A clear road map should be established for **how the pilot will be run**, and what the definitions of success will be. This can reduce the overall risk of the pilot and avoid miscommunication or misaligned priorities between parties.

- While a startup's pilot may be successful by some measure, it still might not move to the next stage, given that technologies compete for the time and financial resources required to deploy them in the corporation. As corporate sponsors must get their own assets to buy into the new technologies, **securing commitments from all parties engaged in a pilot** will be an important contribution to supporting the start-up.

Vertical Specialization

Another important consideration for incubators and accelerators relates to **vertical specialization**, particularly in new industries being developed in a region. Efforts to replicate successful support and management practices from an established field or industry may not be as effective when they are transposed to an emerging field or industry.

Supporting local technology startups in 'high-value' verticals (e.g. artificial intelligence, ag-tech, bio-med, etc.) requires services appropriate to startup needs but with the potential to match international market needs. However, the absence of local 'anchor' companies in a vertical may require a focus on **growing and developing a base of anchor companies**, if the vertical is expected to provide a regional competitive advantage. This may be a priority of a publically-supported incubator.
The policy challenge is supporting entrepreneurial ambition and startup activity in one or more verticals *and* developing anchor companies; to avoid becoming another foreign R&D/innovation 'outpost' for multinationals (and a comparatively expensive one).

New ventures in emerging industries with lower levels of participation will benefit from sponsorship specialization (i.e. corporate accelerators) that allows new businesses to cooperate, build an infrastructure that is mutually advantageous, and establish legitimacy and increased recognition for the emerging vertical and organizational community.

Thus, in locations where strong, local support networks are absent or in their infancy, **incubators and accelerators that facilitate higher rates of social interaction** may increase the chances of survival for new ventures.

4.3 Regional Conditions

It cannot be overstated that the local external environment is a critical factor when considering which incubator models and related services will be more relevant and impactful. The environments found in and around Boston (U.S.), Southern California, Cambridge (UK) and a few other regions are *atypical*, and can be argued to act as "**regional incubators"**.[48]

In these well-developed environments, a strong entrepreneurial community has developed; fed by high startup rates and strong capability to select the best projects and allocate resources to them. High levels of innovation within the surrounding region by incumbent firms, large and small, provide a **demand-pull for new innovation** being developed through startup activity.

In environments with lower startup rates and less demand for innovation, incubators may need to play a more proactive **innovation-push** role, with the incubator exercising selection criteria and taking a more active role in venture creation and development support. As mentioned earlier, industry and competitive conditions at founding will influence resource availability, collaborative opportunities, etc.

Despite assertions by leading accelerators, it remains **difficult to measure startup outcomes that can be *directly* attributed to accelerators,** given the challenges in comparing those attending accelerators with those who do not. However, if accelerators serve to shift the 'general equilibrium' of the entrepreneurial ecosystem by improving outcomes or resources for both the attendees and non-attendees in a region, research or program evaluation will not be able to properly capture the full effects of accelerators.

From a policy perspective, this distinction is critical: if accelerators have positive effects on the ecosystem (regardless of their effects on the small number of companies that attend them), **investment in accelerator programs will have an impact on the region**.

In reviewing the location and outcomes of leading accelerators, it is also apparent that **high-performing accelerators do not thrive in isolation from successful regional *innovation* hubs.** Four common themes are identified:

1. Companies of excellence that operate both locally & globally
2. Globally valued special expertise & corporate activities based on this expertise
3. New knowledge creation and application on a global scale
4. International expertise, competence-driven business & investments

Further examination of successful innovation hubs confirms that each develop differently, given different regional capacities and aspirations, and there is no 'one-fits-all-solution' on building up an innovation-friendly environment.

[48] Delgado, Porter and Stern (2014) Clusters, convergence, and economic performance.

Figure 6 identifies some features of two more recent innovation hubs, Stockholm and Berlin, which have both attracted the interest of leading accelerators and which build upon thriving entrepreneurial ecosystems and high levels of startup activity.

Both are also examples of **creative hubs,** comprising different forms that include incubators, accelerators, clusters and planned, contained communities, which are stimulating environments for large corporations, SMEs and startups.

Figure 6: Examples of Regional Capacities & Aspirations

Stockholm

fosters entrepreneurship through socio-cultural supports

significant tax breaks for starting & owning a business

social safety net allows entrepreneurs to feel safe to take risks

significant public support in stimulating ICT capabilities

High level of corporate intrapreneurship

Berlin

fosters diversity by supporting innovative subcultures & free space for trial & error

3.4% of GDP on R&D

85 scientific institutes

~5,900 digital companies

5 clusters; 10 'locations of the future'

100+ co-working spaces

integrative structure: research institutes, spin-offs, universities, private housing, cultural & leisure activities

Further observations can be made regarding the role of policy and leadership underpinning the success of these innovation hubs. First, there is a governance challenge that must be overcome to effectively **mobilize different stakeholders and resources for collaborative innovation**.

This requires developing a culture of partnership and action among innovation players and accelerating effective use of local assets within the context of the quadruple helix (e.g. interactions between university, industry and government: civil society and the media).

Incubators and accelerators have a role to play, along with other 'scaffolding organizations' that function as a bridge between formal institutions and community and act as a support system for bottom-up innovation. This includes **developing the local entrepreneurial talent and ambitions**, or critical input (as suggested in the logic model of incubation) that leading accelerators insist is the most important element of a successful startup ecosystem.

4.4 Funding and Sustainability

Funders typically define the wider purpose of an accelerator which will drive the selection of entrepreneurs/ventures and the types of services provided. As a result of accelerator funders often being private, accelerators emerge in different regions in different years, often for reasons exogenous to the nature of the ecosystem at the time of entry or precisely because of its lacking.

Assessment of need is critical, and many incubators have failed because **there is not sufficient demand for their service portfolio**. An understanding of the market, and more specifically the relevant model, is essential to its success.

- The **choice of which companies to target** has important implications for the incubating models, as companies operating at a local level have different needs from those operating at a national and/or international one.

The mission of an incubator or accelerator has to **closely align with the interests of founders** who would join it, and this mission must be unambiguous and focused on these founders. For example, if a startup's ambition is to scale rapidly and globally, then it should pick a program that is focused on helping startups to do that, and whose business model is also geared toward that end, such as a for-equity program that benefits only when the startup grows large.

- The more clearly an incubator **defines the incoming new venture profile**, the better this incubator will be able to leverage its given competencies as well as create potential synergy effects among already resident startups.

Financing must be provided at a sustainable and realistic level to achieve incubation or accelerator success. Providing supporting services to any set of startups is costly, with most startups being cash-strapped and unable to pay the full value for the services themselves.

Table 6 provides some examples of funding options for incubators and accelerators.[49]

Table 6: Funding Options for Incubators and Accelerators

Incubator Funding	Accelerator Funding
Growth-driven model: • Designed to be financed by taking equity in startups, taking a share of start-up earnings or funding through Angels & VCs • Incubators must have access to stream of high-growth ventures & 'patient' backers who will support incubator for a number of years	**Investor led:** • Investors as key stakeholders who develop ventures ready for follow up funding • focused on later stage startups with some proven track record and high growth potential
Fee-driven model: • Financed directly by startups: through fees for rent, membership fees or service fees • Favours startups which have already established a revenue-stream or have investment • Not sustainable model for supporting pre-startup entrepreneurs or very early stage startups	**Matchmaker**: • Corporations customers as key stakeholders who match up later stage startups with ideas or technology relevant to corporate's customers • Use of corporate mentors who guide startups through complex corporate decision-making structures
Independent programs: • Do not rely on startups as source of income • Funding from public bodies and corporate sponsors who value incubator also for running events, hiring out spaces, providing catering using the incubator space, etc. • Able to service a wider range of stages of the startup journey, but tend to focus on pre-startup and startup phase	**Eco-system builders**: • Government as key stakeholder, with aim to develop an ecosystem of startups within a region or technology sector • Focus is typically on very early stage ventures

Some programs, such as the Israeli incubator program, combine public and private incentives that also draw in different funding mechanisms for startups to help them **bridge the post-seed 'valley of death,**' including public loans/grants, accelerator funds, micro-VC funds, etc.

Growth-driven and investor-led programs will be influenced by the expertise, experience, track-records and networks of participating investors as well as strength of the

[49] Clarysse et al (2015) A look inside accelerators; Dee et al (2015) Startup Support Programmes: What's the difference?

entrepreneurial community, demand-pull for new innovations and other regional conditions.

The funding model will impact the incubator or accelerator strategy and choice of clients, and all have their vulnerabilities. Reliance on funding from a single corporate sponsor, government funding body or investor group, for example, runs the risk that withdrawal of funding makes the program unsustainable, or requires significant repositioning from its original purpose.

4.5 Conclusions

In completing this report, it became apparent that some ambiguity exists regarding **the stage at which incubation becomes 'acceleration'** and regarding the explicit difference between the two concepts. In general terms, i**ncubators** can be seen to work with businesses earlier in the process, typically at the startup and early venture stage and to offer support for core business activities and early resource access, facility access, etc.

On the other hand, **accelerators** will often work with new businesses at a later development stage, and programs can be short and extremely intensive. It can also be seen that incubators will often engage in 'acceleration' as their business clients develop, and that there is no 'progression criteria' from incubator to accelerator in most cases.

This report suggests that incubators and accelerators should not be considered in isolation in regional ecosystems, and on their own, are insufficient to build strong entrepreneurial communities. **High levels of entrepreneurial ambition and talent** are required to feed these programs, and the programs themselves must be able to **attract high quality managers, mentors, corporate sponsors and investors** who can select and support the best projects and allocate resources to them.

Incubators and accelerators should be **embedded into the overall development policy of a region,** with their roles and activities integrated in the regional context. The support ecosystem requires **aligned strategies and incentives and close collaboration** so that knowledge and resource exchange, transfer and exploitation efforts are efficiently coordinated; allowing companies to rapidly innovate**.**

In this regard, it is important that the contributions of different organizations are aligned with incubator and accelerator objectives. Some 'sponsor' organizations **contribute to increasing survival rates of new ventures**. Certain policies and funding programs can aid in buffering particular environmental liabilities for high-risk, high-potential ventures in the critical startup and early development stages, while recognizing the need not to make these ventures over-reliant on public support.

Other sponsors assist in **mediating the relationship between new ventures and their environments.** This includes facilitating partnerships, collaborations, or investments into

new ventures and bridging between new ventures and resources located in the local/regional environment.

The importance of developing '**complete companies** in a region,' as suggested in the case of Israel, requires high-level support capabilities to assist founding teams in building globally-relevant companies; capabilities typically found amongst those who have 'been-there, done-that' in the private sector.

The report suggests that **corporate sponsorship** can provide valuable product and market validation opportunities for startups and contribute to **demand-pull** for new innovations in a region, but requires clear guidelines on risk sharing and effective process management to be successful.

The report further suggests that incubators and accelerators specializing in startups in particular verticals may require coordinated policy support to **grow and develop a base of anchor companies**, if the vertical is expected to provide a regional competitive advantage. This could include efforts to **attract external talent and companies** who would be drawn to a region if the innovations are leading-edge and the startup ecosystem vibrant and well-supported.

Finally, it is suggested that future consideration to adopt or create new incubators or accelerators using public funding must **address the current state and performance of the existing (Alberta) enterprise support ecosystem** to validate the gaps in existing support provision. From there, assessment of different models and approaches best suited to address this gap, along with considerations of wider regional effects, could be undertaken.

REFERENCES

Aernoudt, R. (2004) Incubators: tool for entrepreneurship? *Small Business Economics*, 23(2), 127-135.

Aerts, K., Matthyssens, P., & Vandenbempt, K. (2007) Critical role and screening practices of European business incubators. *Technovation*, 27(5), 254-267.

Agrawal, A. and Cockburn, I. (2003) The Anchor Tenant Hypothesis: Exploring the Role of Large, Local, R&D-Intensive Firms in Regional Innovation Systems. *International Journal of Industrial Organization* 21 (9): 1227– 53.

Amezcua, A. S., Grimes, M. G., Bradley, S. W., & Wiklund, J. (2013) Organizational sponsorship and founding environments: a contingency view on the survival of business-incubated firms, 1994–2007. *Academy of Management Journal*, 56(6), 1628-1654.

Arzaghi, M. and Henderson, J.V. (2008) Networking off Madison Avenue. *Review of Economic Studies* 75 (4): 1011–38.

Bøllingtoft, A. and Ulhoi, J. (2005) The Networked Business Incubator - Leveraging Entrepreneurial Agency? *Journal of Business Venturing*, 20: 265-90.

Bøllingtoft, A. (2012) The bottom-up business incubator: Leverage to networking and cooperation practices in a self-generated, entrepreneurial-enabled environment. *Technovation*, *32*(5), 304-315. Elsevier. doi:10.1016/j.technovation.2011.11.005

Bone, J., Allen, O., & Haley, C. (2017) Business Incubators and accelerators: the national picture. *BEIS Research paper*, (7).

Bradley, S. W., Shepherd, D. A., & Wiklund, J. (2011) The importance of slack for new organizations facing 'tough'environments. *Journal of Management Studies*, 48(5), 1071-1097.

Brüderl, J., & Preisendörfer, P. (1998) Network support and the success of newly founded business. *Small Business Economics*, 10(3), 213-225.

Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A. (2012) The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, *32*(2), 110-121.

Bussgang, J., & Stern, O. (2015) How Israeli Startups Can Scale. *Harvard Business Review*. September.

Chinitz, B. (1961) "Contrasts in Agglomeration: New York and Pittsburgh." *American Economic* Review 51 (2): 279– 89.

Clarysse, B., Wright, M., & Van Hove, J. (2015) *A look inside accelerators*. London: Nesta.

Clarysse, B., Wright, M., Lockett, A., Van de Velde, E. & Vohoram, A. (2005) Spinning Out New Ventures: A Typology of Incubation Strategies from European Research Institutions, *Journal of Business Venturing,* 20, pp. 183-216.

Currid-Halkett, E. and Stolarick, K. (2011) The Great Divide: Economic Development Theory versus Practice: A Survey of the Current Landscape, *Economic Development Quarterly*, 25: pp. 143-57.

Dahl, D. (2011) How to Choose an Incubator. Jan 26, *The New York Times*. http://archive.nytimes.com/www.nytimes.com/2011/01/27/business/smallbusiness/27sbiz.html

Dee, N. J., Livesey, F., Gill, D., & Minshall, T. (2011) Incubation for Growth. Research summary.

Dee, N., Gill, D., Weinberg, C. and McTavis, S. (2015) Startup Support Programmes: What's the difference? London: NESTA. http://www.nesta.org.uk/sites/default/files/whats_the_diff_wv.pdf

Delgado, M., Porter, M. E., & Stern, S. (2014) Clusters, convergence, and economic performance. *Research Policy*, 43(10), 1785-1799.

European Commission (2018) Success and Failure Factors in Business Incubation. SUPER Project - Start-Up Promotion for Entrepreneurial Resilience.

European Commission (2002) Europe's cities: Centres of Innovation Culture, Innovation & Technology Transfer, *EC,* February.

Feldman, M. and Zoller, T.D. (2012) Dealmakers in Place: Social Capital Connections in Regional Entrepreneurial Economies. *Regional Studies* 46 (1): 23– 37.

Glaeser, E., Kerr, W.R. and Ponzetto, G.A.M. (2010) Clusters of Entrepreneurship. *Journal of Urban Economics* 67 (1): 150– 68.

Global Corporate Venturing (2016) This is why most Start-up Accelerators Fail. September, https://leanventures.se/blog/startup-accelerators-fail/

Gonzalez-Uribe, J., & Leatherbee, M. (2016) The effects of business accelerators on venture performance: evidence from start-up Chile (August 11).

Government of Canada (2019) Key Small Business Statistics, Innovation, Science and Economic Development Canada, January, www.ic.gc.ca/sbstatistics

Gregson, G. (2018) Critical Perspectives on SME Funding in Canada, *National Angel Capital Organization* (NACO), Toronto.

Grimaldi, R. and Grandi, A. (2005) Business Incubators and New Venture Creation: An Assessment of Incubating Models'" *Technovation*, 25: 111-21.

Hackett, S. M., & Dilts, D. M. (2004) A systematic review of business incubation research. *The Journal of Technology Transfer*, 29(1), 55-82.

Hallen, B.L., Bingham, C. and Cohen, S. (2016) Do accelerators accelerate? If so, how? The impact of intensive learning from others on new venture development, available at: https://ssrn.com/abstract=2719810.

Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2013) Who creates jobs? Small versus large versus young. *Review of Economics and Statistics,* 95(2), 347-361.

Hathaway, I. (2016) What startup accelerators really do. *Harvard Business Review*, 1.

Hochberg, Y.V. (2016) Accelerating entrepreneurs and ecosystems: The seed accelerator model. *Innovation Policy and the Economy*, 16(1), 25-51.

Hochberg, Y. V., & Fehder, D. C. (2015) Accelerators and ecosystems. *Science*, 348(6240), 1202-1203.

Hochberg, Y.V., Lindsey, L. and Westerfield, M. (2015) Resource Accumulation through Economic Ties: Evidence from Venture Capital. *Journal of Financial Economics* 118 (2): 245– 67.

Hochberg, Y.V., Ljungqvist, A. and Lu, Y. (2007) Whom You Know Matters: Venture Capital Networks and Investment Performance. *Journal of Finance* 62 (1): 251– 307.

Isabelle, D. (2013) Key factors affecting a technology entrepreneur's choice of incubator or accelerator. *Technology Innovation Management Review*, 16-22.

Kerr, W. R., Nanda, R., & Rhodes-Kropf, M. (2014) Entrepreneurship as experimentation. *Journal of Economic Perspectives*, 28(3), 25-48.

Knopp, L. (2012) State of the Business Incubation Industry. In *NBIA Research Series*. Athens, Ohio: National Business Incubation Association.

Lerner, J. (2009) *Boulevard of Broken Dreams: Why Public Efforts to Boost Entre-Venture Capital Have Failed–and What to Do about It*. Princeton, NJ: Princeton University Press.

Marmer, M., Herrmann, B. L., Dogrultan, E., Berman, R., Eesley, C., & Blank, S. (2011) Startup genome report extra: Premature scaling. *Startup Genome*, 10, 1-56.

Mocker, V., Bielli, S., & Haley, C. (2015) Winning Together: A Guide to Successful Corporate-Startup Collaborations.

Nowak, M. J., & Grantham, C. E. (2000). The virtual incubator: managing human capital in the software industry. *Research Policy,* 29(2), 125-134.

Ortmans, J. (2016) A Hard Look at Accelerators. *Kauffman Currents*. Retrieved from: https://www.kauffman.org/blogs/currents/2016/04/a-hard-look-at-accelerators

Rodan, S., & Galunic, C. (2004) More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, 25(6), 541-562.

Rosenberg, D. (2018) *Israel's Technology Economy: Origins and Impact*. Springer.

Rubin, T. H., Aas, T. H., & Stead, A. (2015) Knowledge flow in technological business incubators: evidence from Australia and Israel. *Technovation*, 41, 11-24.

Samila, S. and Sorenson. O. (2011) Venture Capital, Entrepreneurship, and Economic Growth. *Review of Economics and Statistics* 93 (1): 338–49.

Scillitoe, J. L., & Chakrabarti, A. K. (2010) The role of incubator interactions in assisting new ventures. *Technovation,* 30(3), 155-167.

Shankar, R. K. & Shepherd, D. A. (2018) Accelerating strategic fit or venture emergence: Different paths adopted by corporate accelerators. *Journal of Business Venturing*.

Sherman, H., & Chappell, D. S. (1998) Methodological challenges in evaluating business incubator outcomes. *Economic Development Quarterly*, 12(4), 313-321.

Smilor, R. W. (1987) Commercializing technology through new business incubators. *Research Management*, 30(5), 36-41.

Winston Smith, S. and Hannigan, T. J. (2015) Swinging for the Fences: How Do Top Accelerators Impact the Trajectories of New Ventures? Working Paper.

REPORT AUTHOR

Geoff Gregson

Geoff Gregson is a Research Fellow with the Centre for Innovation Studies (THECIS) and a Research Associate with the Institute for the Study of Science, Technology & Innovation (ISSTI) at the University of Edinburgh. His areas of research and industry engagement cover entrepreneurship; technology commercialization; SME growth; innovation strategy, systems, policy and evaluation; and equity risk capital. He holds a PhD and LLM from the University of Edinburgh and MBA from the University of Calgary.

Appendix A: Case Analysis: Corporate Incubation Activities

Wesley Clover International (WCI), Ottawa, ON

WCI's approach involves two methods for investing in innovation. The first involves working with a number of large, strategic partner companies who help WCI identify market gaps, where clients are looking for something that does not yet exist. These gaps provide a signal for WCI that such gaps might be a good thing to invest in and develop. WCI will then develop companies from scratch in order to fill this gap. The **'fore-sighting' process** that WCI undertakes is as follows:

- MCI sits down with the client at regular periods and goes through a triage process in which the client's staff out in the field are gathering feedback from customers;
- As the client gets evidence of an unmet need, the client will 'earmark' these and bring them to the table to discuss with WCI;
- WCI then undertakes a market survey and further study to verify if a gap exists, whether other companies in the market are already providing it or if others are currently developing a solution;
- If evidence suggests to WCI that the gap exists, they will then approach a strategic partner, e.g. Fijtsu, and identify that a key client is asking for that capability. WCI will further develop ideas around the gap and solutions.
- WCI will then present a business case to address the gap. At this point, WCI is prepared to build the solution for the client to their requirements, if the client thinks it worthwhile. WCI will also perform its own assessment of whether the client is really "desperately in need of the solution, willing to be a beta client and to assist WCI in development of the solution." While WCI will incur the costs to build the solution, they expect the client to buy the solution once it is developed. If they don't decide to buy, then Michael suggests that WCI may have got it wrong, and may need to go "back to the drawing board."
- If the client decides to go forward, WCI will seek to recruit approximately four people (often from a university) with three being tech people and the other a business person. MCI will focus the team on "building to the requirements of the client," with customers identified who are ready to buy the product.

As WCI brings together teams to build a new product, it provides them with capabilities and resources that include mentoring on how to run the company, logistics, legal, HR, financial management, office and IT support and funding for salaries (although this is typically much less

than what team members would earn in the market). The salary difference is converted into equity in the new company.

As the team launches and grows as a company and generates sales, WCI will train them on sales management, marketing techniques and building channels to market, as well as putting them in touch with outside investors most likely to invest in the developing business opportunity.

The second method, which can be described as the “classic start-up facility” involves WCI screening and further supporting existing but early-stage companies. This includes provision of a competitive **incubator-accelerator facility, called *L Spark***, which seeks applications 3-4 times a year from new young companies, who make their pitch and go through a ‘winnowing’ process until MCI identifies those that have the best potential for growth.

The accelerator program runs for 9 months and MCI will choose approximately three companies per intake. The key objective is to bring these companies to the point of being investment ready, with WCI taking a role in finding investment for them. Specifically, WCI will work with outside VC firms, private equity companies as well as providing their own investment. WCI spends considerable time getting these companies organized, structured, and improving the way they operate, so that they are attractive to outside investors. **The accelerator is a partnership with Invest Ottawa, the local city-run facility as well as with Queen’s University, with some funding assistance from CAIP (Canadian Accelerators Incubator Program).**

The other program is the **incubator side of Invest Ottawa**, which is also competitive, and which accepted nine companies (from 130 initial applications of interest) in a latest round of applications. The **incubator is a much shorter program,** typically 3 months, and at the end of 3 months, WCI may invest in them. In the meantime, WCI has helped to build them up, get them organized and structured to be more effective businesses.

WCI does not have any equity interest in incubator companies when they walk through the door. However, if these companies show promise after the first 3 months, WCI will make an initial investment, and provide another investment after 6 months. After 9 months, as the company leaves the incubator, WCI will take an investment position with the company, along with outside investors.

WCI also supports an **incubator facility in Victoria, BC** which receives money from the federal government through Western Diversification (the equivalent of Ontario's FedDev or Quebec's Regional Development Fund) and from the BC government. The program is run through a charitable foundation, the Alacrity Foundation, and directed by Owen Matthews. It was created to support a number of new companies, **in association with the University of Victoria**.

Project teams, typically four members, emerge from the University of Victoria, with each member entering a University program for two years. The first year is academic training in running a business, and participants receive a diploma in business management. Approximately 3 out of the 4 team members will be technology people, and the other will be a business studies student. The business student will take the year learning about technologies and marketing, sales and distribution channels most relevant to technology companies.

In the second year, WCI will host the project team in their facility, and build the project team into a cohesive unit which then is tasked with developing a first product - which will be then tested with outside clients. Following the end of the second year, the project team is launched as a company. WCI automatically owns one-third of the company, with one-third owned by the Alacrity Foundation which supported the company (with the company not expected to be dependent on public funding to sustain itself much further) and one-third owned by the company founders.

WCI starts up approximately 4-6 new tech companies per year and intends to scale this up internationally in the coming few years. For example, **WCI supports an incubator in Wales** created along the lines of the Victoria incubator, where services are delivered through a charitable foundation. In Istanbul, WCI has created a fund with ten different local investors, and WCI is to open other incubators in Mexico City, Paris and later in Jakarta.

Each of these new initiatives is created with teams of local investors tying up with local universities to identify talent and working with local companies to identify market gaps and product needs. Thus **WCI's international expansion is based on the model developed in Canada.**

In summary, WCI adopts three approaches to developing new innovations: 1) building new companies from scratch to address gaps/white spaces in particular markets or verticals, to meet identified needs of clients or other large, strategic partner companies (such as MyTel, Fijutsu, Vodafone); 2) the accelerator process, through L Spark; and 3) the partnership incubator program.