

Atlantic Canadian Startup Community

Data Report

2018



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Executive Summary

Early in 2019, the prevailing attitude in the Atlantic Canadian startup community is that we are making good progress on an unfinished job. There is a feeling among founders and support organizations that the job isn't done yet. The community still doesn't have a billion-dollar company. There hasn't been a \$50-million-plus venture capital round. None of the hundred largest Canadian tech companies is based in Atlantic Canada. Yet the progress is undeniable. The pages of this report will demonstrate that the high-growth innovation companies on Canada's East Coast have made huge strides in the past five years, in terms of employment, funding, revenue and number of companies. Consider the data that we've collected for the most recent of our six reports on the Atlantic Canadian startup community:

- The number of startups (our word for high-growth innovation companies) based in Atlantic Canada has grown to 550 as of the end of 2018, up from 263 when we did our first report in 2013. In the most recent year, the growth came as 115 companies were launched and 65 companies failed.
- Direct employment by startups is rising strongly. About 5,500 Atlantic Canadians worked at startups by the end of 2018, up 22 percent from about 4,500 a year earlier, the growth driven by both younger and more established companies.
- The companies that shared revenue data with us produced a weighted average growth of 75 percent. That may understate the real situation as several companies reported only percentage gains, and most of these companies doubled their sales or better last year. For the second year in a row, there was exceptional sales growth in Newfoundland and Labrador.
- The startups reported record funding in 2018, led by New Brunswick. In total, Atlantic Canadian startups raised \$166.6 million from private investors, venture capital funds and strategic partners. That's up 43 percent from \$116 million in 2017, which was also a record year for funding.
- The funding picture is even rosier when you consider that publicly listed companies in the Atlantic Canadian startup community raised \$24.7 million in the stock markets. As long as public markets remain strong, stock markets should continue to be an important source of funding for high-growth companies as more East Coast companies will likely seek listings.
- We also dispute the popular conception that angel funding has dried up in the region. We learned of a record \$29.4 million in angel funding in 2018 – more than any year since we began these reports in 2013. The Creative Destruction Lab-Atlantic has done a superb job of bringing business leaders into the angel community, and the CDL fellows and angels invested \$7 million in its first two years. Island Capital Partners is also serving as a focal point for angels on P.E.I.

To be sure, the startup community is evolving. One aspect we examine in this report is the growing relationship between the innovation community and traditional businesses. We make the case that this relationship is benefiting both sides: startups are gaining early adopters, mentors and capital; and traditional business executives are learning the importance of research and development.

As part of this evolution, Atlantic Canada can now assess its position and growth compared with other startup communities around the world for the first time. Innovacorp in 2019 signed the region up to be included in the Startup Genome report on global startup communities. In its most recent report, Startup Genome ranks Atlantic Canada as No. 4 in its "Activation Phase" startup ecosystem, lagging behind Western Denmark, Belgrade and Novi Sad, and Taipei. Atlantic Canada is the top ecosystem in the category for early stage funding per startup, edging out Frankfurt and New Zealand. Other Canadian cities in the Activation Phase – which is the earliest-stage of three categories -- are Calgary, Edmonton and Quebec City. The evolution of the Atlantic Canadian startup community will continue, and we were struck by a comment by Build Venture Partner Rob Barbara at a recent talk at Volta. He noted that there was an attitude when the startup craze began that everyone needed to help everyone else to develop the community. He noted that that willingness to help out hasn't diminished as the community has grown and the spirit of mutual assistance is one reason to be optimistic about the outlook.

Speaking of Volta, we at Entrevestor want to thank Volta and the Atlantic Canada Opportunities Agency for working with us to make this report available to the public. It is the first year that it is open to everyone, and we hope our work advances the understanding of the startup community.

About Entrevestor

Entrevestor was founded in 2011 by writers Peter and Carol Moreira as a portal to unite and inform the startup community in Atlantic Canada. It posts daily news on Atlantic Canadian startups on its website, www.entrevestor.com, and it provides the benchmark data for the East Coast startup community.

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Section I – Background

One important note on our terminology: Entrevestor uses the term “startup” to refer to high-growth innovation companies. The age of the company is irrelevant in considering what constitutes a startup. To us, the company must meet three criteria: It must be locally owned, commercializing technology, and producing a product for the global market. “High-growth innovation company” is a clunky term, so for the sake of brevity we refer to them as “startups”. ■

1.1 Macro-Economic Background

Though its economic growth was unremarkable in 2018, there were signs of strength in the Atlantic Canadian economy, especially in terms of human resources. Immigration continued to drive population growth, and the unemployment rate fell in most of the Atlantic provinces, spurring wage growth. For the first time in recent memory, three of the four governments reported budgetary surpluses in the 2018-19 fiscal year.

The most telling feature of the East Coast economy is that it still underperforms the country overall in terms of output. Based on estimates released in late 2018, all four Atlantic provinces experienced a decline in GDP growth in 2018, and all four reported GDP growth rates below the national mark. ■

Chart 1.1 - GDP Growth

Jurisdiction	2017	2018 (E)
Canada	1.4%	2.0%
Prince Edward Island	3.5%	1.4%
Newfoundland and Labrador	0.9%	-1.0%
New Brunswick	1.8%	1.0%
Nova Scotia	1.5%	0.8%

Source: RBC report on Canadian provinces' GDP growth.¹

The outlook for 2019 varies greatly among forecasting agencies, though most agree Nova Scotia will continue its ponderous growth. Most believe Newfoundland and Labrador's growth rate will top 2 percent in 2019. And the Conference Board of Canada is especially bullish on Prince Edward Island. In its outlook for the 10 provinces, the Conference Board said: “With an influx of international migrants supporting strong growth in residential construction and elevated demand for P.E.I. products boosting exports and manufacturing, the Island's real GDP is expected to grow by 3.2 per cent in 2019, making it the only Canadian province where economic growth surpasses the 3 per cent mark this year.”²

The aspect of economic development that has been most successful over the past couple of years is the region's ability to attract immigrants. Nova Scotia, for example, attracted a record 5,970 immigrants in 2018, some 500 more people than the previous record in 2016. In July 2018, StatsCan said P.E.I. was the fastest-growing province in the country over the past two years, increasing 4.6 percent to 153,244, largely because of newcomers from other countries and provinces. The most important fact is that all four provinces have seen population growth over the last three years (though Newfoundland and Labrador actually recorded a one-year decline in 2018). ■

¹ <http://www.rbc.com/economics/economic-reports/pdf/provincial-forecasts/provfcst-dec2018.pdf>

² <https://www.conferenceboard.ca/press/newsrelease/2019/02/27/uneven-economic-outlook-for-canadian-provinces-in-2019?AspxAutoDetectCookieSupport=1>

Chart 1.2 - Population Changes in the Atlantic Provinces

As the population has risen, the unemployment rate has fallen in these provinces despite the tepid economic growth. The region has joined the national trend in adding more jobs to the economy and reducing the unemployment rate. These employment gains have come as the provincial governments for the most part have restrained spending, so job growth is occurring largely in the private sector. ■

Province	2016	2018
Nova Scotia	1.4%	2.0%
New Brunswick	3.5%	1.4%
Newfoundland and Labrador	0.9%	-1.0%
Prince Edward Island	1.8%	1.0%

Source: <http://worldpopulationreview.com/canadian-provinces/>

Chart 1.3 - Unemployment Rates

Province	Unemployment Rate December 2018	YoY Change (Percentage points)
NL	11.7	-3.0
NS	7.1%	-0.9
PEI	9.6%	-0.1
NB	8.4%	0.6
Canada	5.6%	-0.2

Source: Statistics Canada

With employment and populations rising, the region is experiencing robust wage growth, with some locations leading the country in rising paycheques. StatsCan said in the spring of 2019 that Nova Scotia had the best performance in the country in wage growth with wages to April rising 4.6 percent year-on-year. New Brunswick placed third with 3.9 percent growth. The national mark was 3.3 percent.³

One final aspect of the regional economy that we should mention is that the governments are showing admirable restraint in their spending. Nova Scotia, New Brunswick and Prince Edward Island all reported surpluses in the 2018-19 fiscal year and are forecasting surpluses again in the current fiscal year. Newfoundland and Labrador reported a deficit of \$547 million in the latest fiscal year, though the government stressed that was down from a starting point of over \$2.5 billion. Even the federal government, which has been posting deficits since it took office, is only running a fiscal deficit of about 1.2 percent of GDP, compared with the U.S. mark of 4.0 percent of GDP. ■

1.2 Recap of our 2017 Report

The story of the Atlantic Canadian startup community in 2017 focused on revenue. It was not the only part of the story by a long shot. There was strong company formation, development of the ecosystem, and funding was strong. But as we discussed our report with members of the startup community across Atlantic Canada last year, the discussions seemed to zero in on revenue – both the companies that were growing it, and those who weren't.

Our most important finding was that companies with revenues increased those revenues by 73 percent in 2017. Of the 171 responses to our survey covering that year, we received detailed revenue data from 124 companies, and the total revenue of these companies rose by 73 percent. There were two reasons: about 17 percent of the companies reported revenue for the first time; and one-fifth of respondents reported 100 percent revenue growth or better. We were able to identify 35 elite companies that have found product-market fit and are rapidly driving revenues higher. We also named 51 “scaling” companies, which comprise an echelon just below the elites.

At the other end of the spectrum, we delved into the failures and zombies (companies that have failed to generate revenues). We discovered 66 companies from our databank in 2016 failed in 2017, and a further 90 were zombies – startups that hadn't failed, but had not moved their product into the market after several years. That means zombies and failures accounted for 156 companies (38 percent) from a total dataset of 414 companies in 2016.

Our other main findings in 2017 were:

Company Formation – We found that a record 114 startups launched in 2017. It pushed the number of startups and highgrowth companies we covered to 486. The ecosystem is now developed to the point where it can generate and sustain new companies, thanks to strong programming at University of New Brunswick, Dalhousie University and Memorial University, Venn Innovation and Volta, to name just a few.

Employment – We estimated there were 6,400 Atlantic Canadians working for the region's startups and high-growth companies (including companies that have exited). The overall number rose about 7 percent annually. We will always have startups that fail, stagnate or move away, but the companies that endure grew their workforces by 26 percent in 2017. Anecdotal evidence suggests startups are extremely effective at retaining young people and attracting immigrants to the region.

Financing – By our count, East Coast startups raised \$116.1 million in 2017, and we believe there were a few deals that weren't reported to us. It was the most equity investment in one year that we've seen. The financing was dominated by institutions outside the region, which are backing elite companies.

The 2017 report showed that Halifax was now the cornerstone of the community, accounting for 43 percent of the companies and 65 percent of the capital raised. The jurisdiction that improved most quickly was St. John's, where companies reported 33 percent growth in employment and a 178 percent increase in revenues. Other highlights: The number of startups headed by women tripled in three years, and more companies in Sydney were reporting revenues. For the first time, there were enough OceanTech companies (35) to report on them as a sector in their own right. Areas of concern include the apparent underperformance of Saint John, and the shortage of tech talent in several communities.■

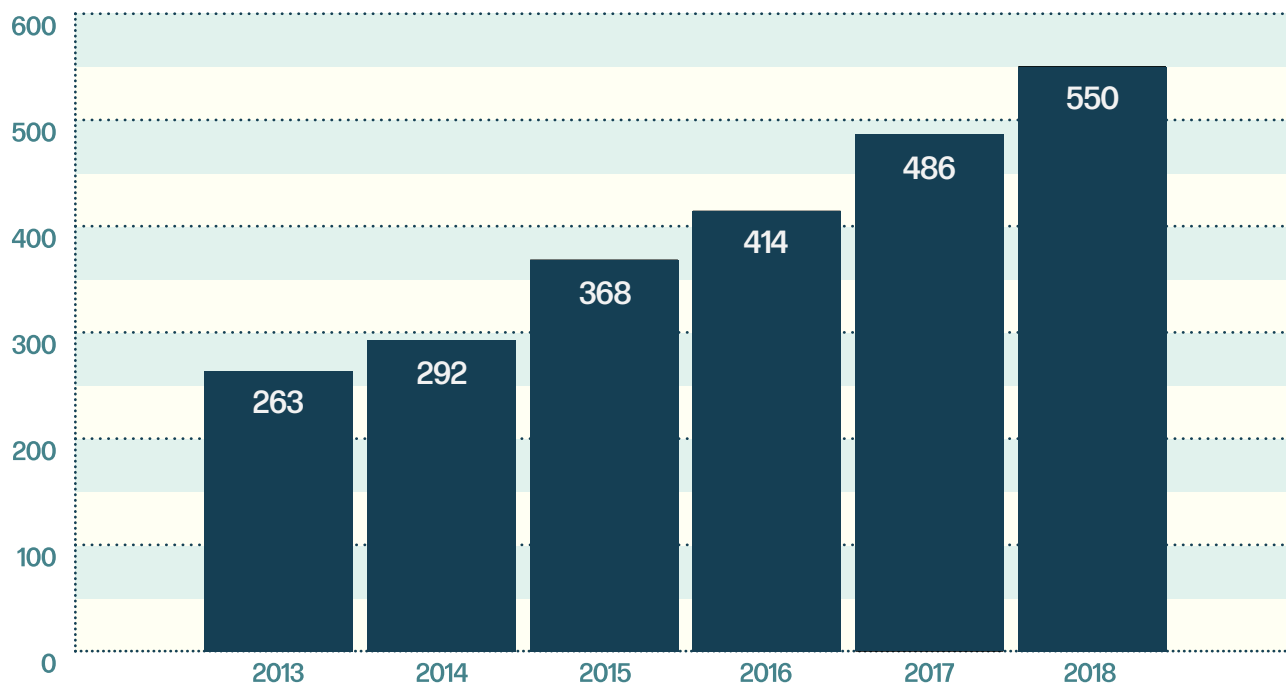
³ Found on the Statistics Canada website: <https://www150.statcan.gc.ca/n1/daily-quotidien/190627/cg-b003-eng.htm>

Section 2 -

The Atlantic Canadian Startup Community

The Entrevestor Databank has grown to 550 companies as of Dec. 31, 2018, which means the group of companies we cover has just about doubled since we began tracking tech companies and innovators in 2013. In those early days, we were counting any company that was involved in innovation or ITC, and weren't terribly picky about whether they were service companies or website providers or whatever. We're far more stringent on our criteria now. ■

Chart 2.1 - Number of Startups in Atlantic Canada



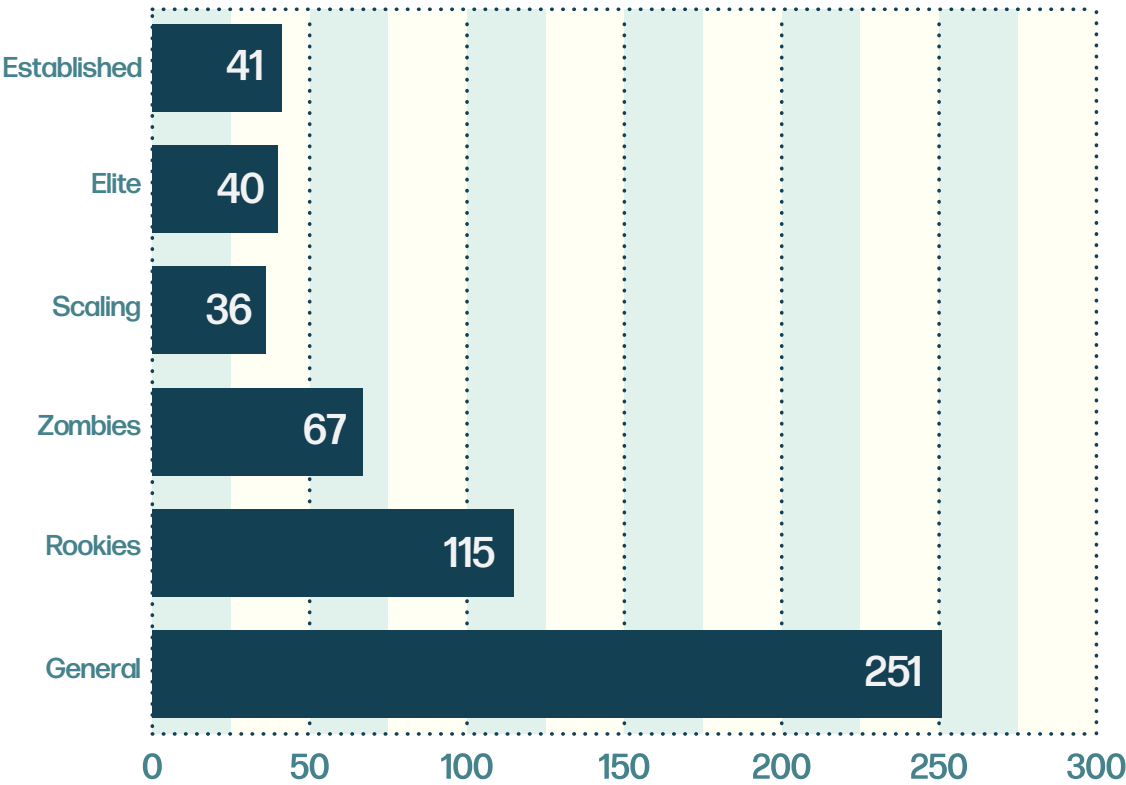
Source: Entrevestor Databank

There has been steady, double-digit growth in the number of companies in the community over half a decade. In the last three years, we've seen annual net growth in a band of about 13 to 17 percent, producing more than 100 new companies each year and shedding upward of 50 through failures. And some of these new companies have been fantastic additions to the community, like Sonrai Security of Fredericton or CoLab Software of St. John's. There's no reason to believe this pace will either accelerate or decline in the coming years. Yes, we're launching more companies than before, but the base has grown. If we grow by about 15 percent annually, the Atlantic

Canadian startup community is due to crack 1,000 companies sometime around 2023.

When we conducted our presentations in late 2018, one slide featured a pyramid that broke down the community into six categories of company. Established companies – the companies more than a decade old that by and large are more like corporations than startups – were at the top. Below them were elite startups, scaling startups, zombies (a shockingly large group), rookies and general startups. At the end of 2018, the makeup of the startup community looked like this:

Chart 2.2 - Categories of Companies in 2018



Source: Entrevestor Databank

We now have fewer zombies and scaling companies than in the previous year, while the number of general startups has risen by 55 percent in a single year. We have taken pains to apply data to our decision-making wherever possible, but there will always be gaps in our knowledge and grey areas. So some of the categories are based on the best information available but are open to debate. There are some companies that could move up or down a notch very easily.

Breaking down the startups by province, we can see little has changed in the past four years. Newfoundland and Labrador's startup community has grown more quickly than the rest of the region, with the number of startups increasing almost 150 percent since 2014, aided by the spike in new companies in the past year. ■

Chart 2.3 - The Startup Community by Province, 2014 vs. 2018

	2014		2018	
	No. of startups	%age	No. of startups	%age
NS	153	53	290	52
NB	79	28	144	26
NL	28	10	69	13
PEI	26	9	47	9
Total	286	100	550	100

When we break the community down by sector, we see that there has been huge growth in life sciences, driven by the work of organizations in all four provinces (See Section 4.2). The decline of manufacturing is surprising given that hardware companies are popular and their revenues are growing strongly. It could be that some hardware companies are now classified as IT companies, and medical device companies fall under life sciences. ■

Source: Entrevestor Databank

Chart 2.4 - The Startup Community by Sector, 2014 vs. 2018

We have not included a breakdown for oceantech companies in this chart because there were so few of them in 2014. We counted 46 companies in 2018 that have ocean applications, up from 35 in 2017. It is one of the fastest-growing portions of the startup community.

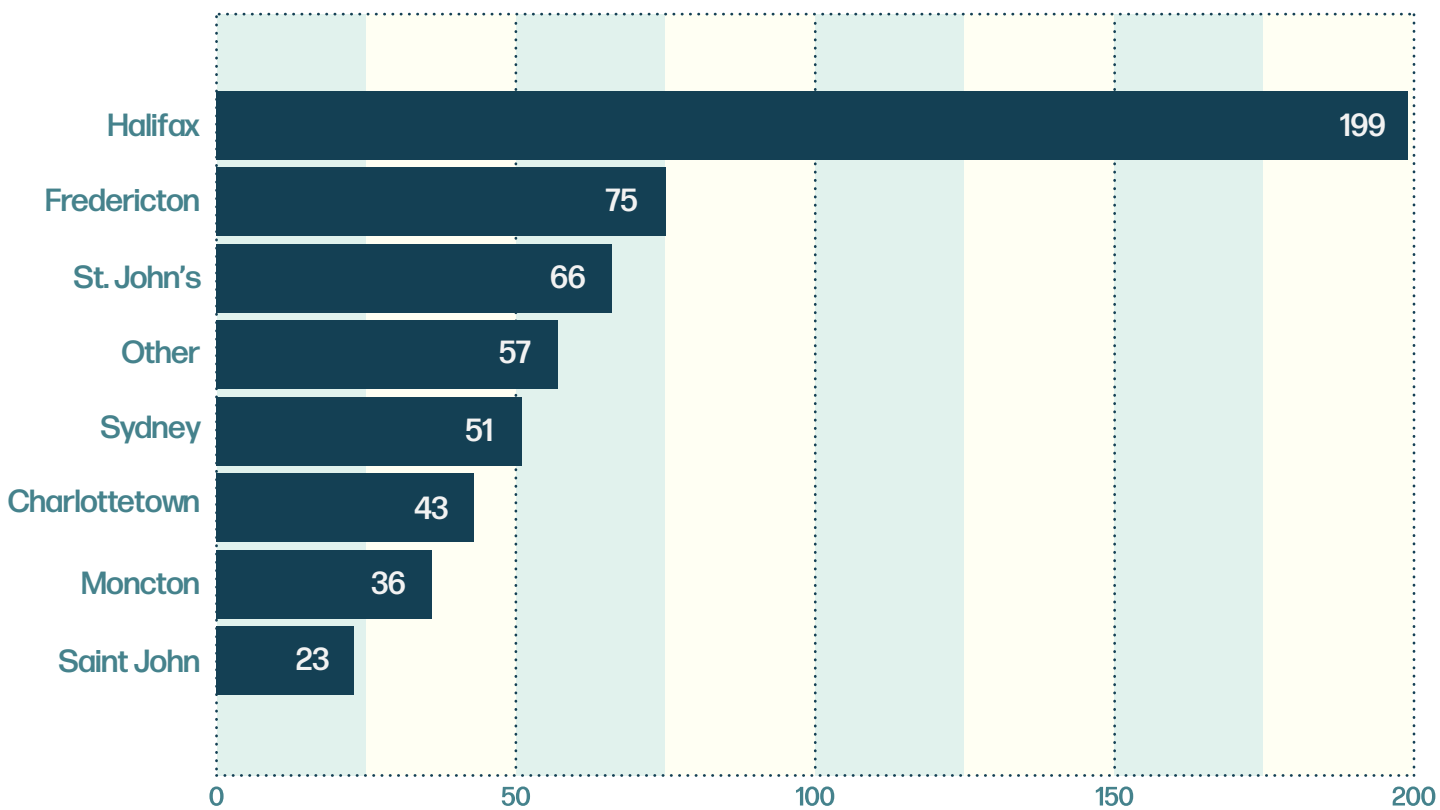
Finally, the breakdown of the location of the startups shows the importance of a few cities. As we reported last year, more than one-third of the startups are now in Halifax (See Section 7.2). In the past five years, Fredericton has established itself as the most important startup centre in New Brunswick, accounting for more than half the startups in the province. It also has a well-capitalized startup group after the record-setting funding bonanza of 2018. St. John's is the home of almost all the startups in Newfoundland and Labrador, and its ecosystem is among the strongest in the region.

Sydney is an underappreciated startup hub. In 2018, one of its companies exited, and several were growing strongly, such as Security and Ubique. Overall, the Sydney community has a lot of companies but many are underfunded and understaffed. ■

	2014		2018	
	No. of startups	%age	No. of startups	%age
IT	188	66	362	66
Life Sciences	48	17	118	21
Manufacturing	32	11	30	6
Cleantech	18	6	40	7
Total	286	100	550	100

Source: Entrevestor Databank

Chart 2.5 - Number of Startups per City, 2018



Source: Entrevestor Databank

2.1 Established Companies

Entrevestor’s criteria for startups (i.e., the companies covered in this report) require that the companies be locally owned, commercializing technology, and producing a product for the global market. Some companies that meet these criteria are established corporations. We’ve included 41 of these companies in our databank as established companies. They include enterprises such as Saint John-based IP TV provider Mariner, the Halifax manufacturer of highway lights LED Roadway Lighting, and the St. John’s-based maker of anti-fraud and money-laundering software Verafin.

We should note that overall the startup community is not satisfied with the number or size of established companies. A stated goal of Propel, the regional IT accelerator, is to produce an Atlantic Canadian tech company with a valuation of \$1 billion, and Innovacorp recently articulated a similar goal. We’re not there yet.

Though these companies tend to have revenues in the tens of millions of dollars, some still display the growth metrics of startup ventures. ■

2.2 Elite Companies

In our 2017 report, we began to identify elite startups – that is, those that raised a lot of money and/or had established a strong history of sales and were growing rapidly. It's difficult to come up with such a list because many companies are secretive, and some of the larger companies are prevented by their venture capital backers from saying much to outside parties. We considered four factors:

- Has the company raised several million dollars in equity funding?
- Does the company have revenue of more than \$1 million and is it increasing that figure more than 50 percent annually?
- Does the company have a staff of more than 10?
- Is there a buzz about the company?

Not all the companies answer yes to all the questions. For example, ABK Biomedical of Halifax is still pre-revenue. But the company has raised almost C\$50 million in equity capital in its history, which places it firmly in the “elite” camp. In the end, we chose 40 companies for the elite category. They are:

ABK Biomedical	Eigen Innovations	LifeRaft	Sequence Bioinformatics
Affinio	Empowered Homes	Manifold	SimplyCast
Appili Therapeutics	Gemba Software Solutions	Mara Renewables	Skyhawks Telematics
Avalon Holographics	Halifax Biomedical	Masitek Instruments	Solace Power
B4Checkin	HeyOrca	Metamaterial Technologies	Sonrai Security
BlueLight Analytics	Introhive	Proposify	Swept
CarbonCure	Kinduct	QRA Corp	TruLeaf
Celtx	Kognitiv Spark	Radiant360	Ubique Networks
Dash Hudson	Kraken Robotic Systems	Resson	Vidcruiter
DiscoveryGarden	LeeWay Marine	ScreenScape Networks	Vineview

There are eight additions to the list this year:

DiscoveryGarden, Charlottetown – It was oversight that we didn't include this company in the elite list in 2017. DiscoveryGarden oversees Islandora, a digital archive that has helped preserve relics from libraries and museums around the world. It has grown into one of the top IT companies in PEI and helped to preserve countless artifacts in some of the world's top collections.

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Empowered Homes, St. John's – The company – whose brand name is Mysa Smart Thermostats – was one of the stars of the first cohort of Creative Destruction Lab-Atlantic in 2017-18 and raised almost \$4 million in two rounds in 2018 and 2019. The company began when CEO Josh Green was performing energy audits and realized that state-of-the-art smart thermostats don't work on high-voltage heating systems. He brought in his brother Zachary as COO and was soon growing the business.

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Gemba Software Solutions, Saint John – Gemba, whose product is called ProcedureFlow, helps corporate clients simplify complicated procedures for employees. Some companies – especially those with call centres -- need their employees to understand hundreds or thousands of business procedures. ProcedureFlow provides companies with a series of flow charts and digital tools that help to train employees and let them find information more quickly. The company was a national finalist in the Fundica pitching event in 2018.

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Kognitiv Spark, Fredericton – Kognitiv Spark only launched its product in 2017, and said early in 2018 it had already booked more than \$1 million in sales. It has also closed a round of funding – the full amount was not disclosed – that included a \$200,000 investment from the New Brunswick Innovation Foundation. Its technology assists industrial companies and other clients in helping workers in remote locations understand how to use or repair complicated machinery.

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Kraken Robotic Networks, St. John's – Publicly listed Kraken specializes in making software-based sensors and underwater robotics systems, and its sales have been soaring lately. The company reported 2018 revenue of \$6.7 million, up 90 percent from the previous year (though it is still not profitable). The company, whose share price tripled in the year to June 1, 2019, has signed several deals with the Canadian military.

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LeeWay Marine, Dartmouth – LeeWay is an outlier in the startup community as it owns ships that help gather ocean data, mostly geographic data. Its sales are increasing rapidly and it was recently named one of six companies in the Scale-Up Hub: Cambridge program, which helps Atlantic Canadian companies sell in New England. It borrowed \$290,600 from the Atlantic Canada Opportunities Agency in early 2019 to speed up the refit of its newest research ship, the LeeWay Striker.

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LifeRaft, Halifax – LifeRaft's main product is Navigator, which helps large organizations and other clients scan social media and other online material to detect threats against them. The company reported "excellent" sales growth in 2018 and in March 2019 had 32 employees.

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Sonrai Security, Fredericton – Sonrai burst on to the scene in January 2019 by announcing it had closed a US\$18.5 million Series A VC round – at the time, it was the largest round ever by an Atlantic Canadian startup. It was massive news for a company's first move out of stealth mode. The enterprise cybersecurity company helps large corporations organize and protect their data on the cloud, which is a network of remote, independently owned servers.

2.3 Scaling Companies

In our 2017 report, we listed 51 scaling companies, selecting them as the companies that showed promise to move into the Elite category. This year, we've narrowed down the list somewhat, listing 36 companies. A few companies moved up to the elite bracket, but more were moved to the General category. Most of these demoted companies have done nothing wrong. We're just focusing more on the word "scaling" than in the previous year.

We want to highlight the companies that are gaining momentum and reflecting it in their sales. As ever, there is a problem with this because not all companies reveal their sales to us. What's more, there are biotech companies with no sales that we have added to the list. We have aimed to come up with a group of companies that are progressing rapidly, according to their funding, employment, revenues and buzz.

Our target for the scaling category is companies that have raised at least \$1 million, have revenues of more than \$500,000, and at least five employees. As is the case with the elite companies, we prefer scaling companies to be doubling revenues each year. And of course, there should be buzz about the company. Our list is not perfect. Some omitted companies will be angry that they're not named, just as some scaling companies will be angry they're not in the elite category. Several of these companies were simply too early to be considered elite, and will no doubt be elevated in the next year or two.

These are the 36 scaling companies:

Adaptiiv	Eli Technologies	Picomole
Alentic Microscience	Eyesover	Rimot.io
Alongside	Finleaf Technologies	Seaformatics Systems
Arcturus	Forestry.io	Securicy Data Solutions
Beauceron Security	Global Spatial Technology	Simptek
BlockCrushr Labs	GoBumpFree	Smartpods
Chinova Bioworks	Harbr	Solid State Pharma
Clockwork Fox Studios	Jaza Energy	SomaDetect
CoLab Software	Leadsift	Somru Bioscience
Covina Biomedical	Live Ship	Squiggle Park
Cribcut	Orenda	StepsCan
Densitas	Peer Ledger	Whitecap Scientific

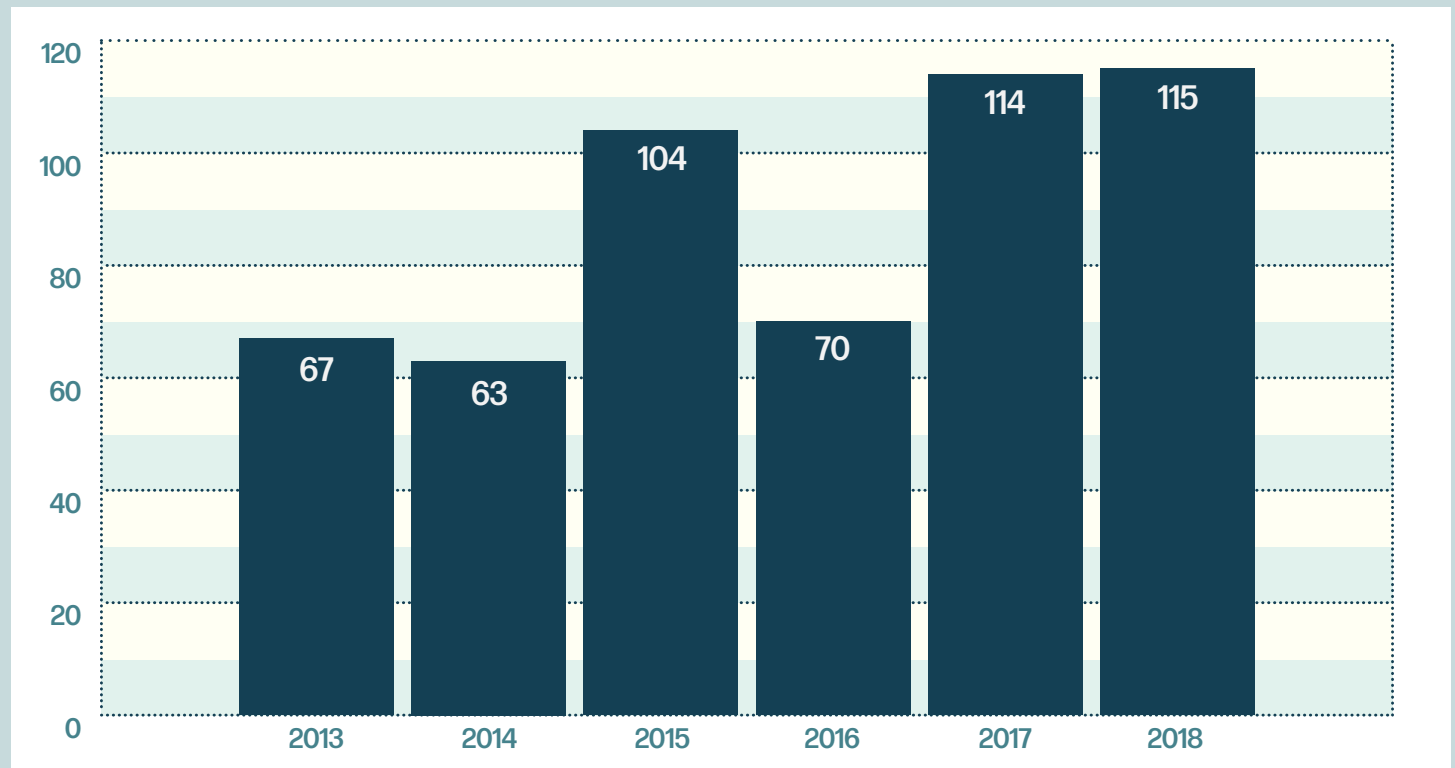
One final point about scaling companies is that we expect the community overall will place more emphasis on sales growth in developing the ecosystem in the coming years. The focus in the first half of the decade was on teaching entrepreneurs to find product-market fit. That's old hat now. The No. 1 mission for the ecosystem is teaching entrepreneurs to sell. Most of the new programs for entrepreneurs in the past few years have focused on sales: Scale-Up Hub: Cambridge, which encourages sales in New England; UNB's Scale Up Atlantic Canada (offered in collaboration with Babson College); Propel's Incite program, whose second phase is devoted entirely to sales; the sales-focused MBA channel at UNB Saint John.

The focus of the ecosystem has shifted to scaling, and this category is becoming more and more important. ■

2.4 Company Formation

We have catalogued 115 companies that were formed in 2018, up by one over the record level of 2017. We should add that this is the best information we have at this time. Startups often form quietly and then announce their presence a year or two later. Every year we add companies to the data bank that are more than one year old. But we are aware of 115 startups that were born in 2018. ■

Chart 2.6 - New Companies, 2013-2018



Source: The Entrevestor Databank. (Note: this chart shows the number of new companies we identified at the end of each year. It does not include companies that are more than a year old that have been added to the databank.)

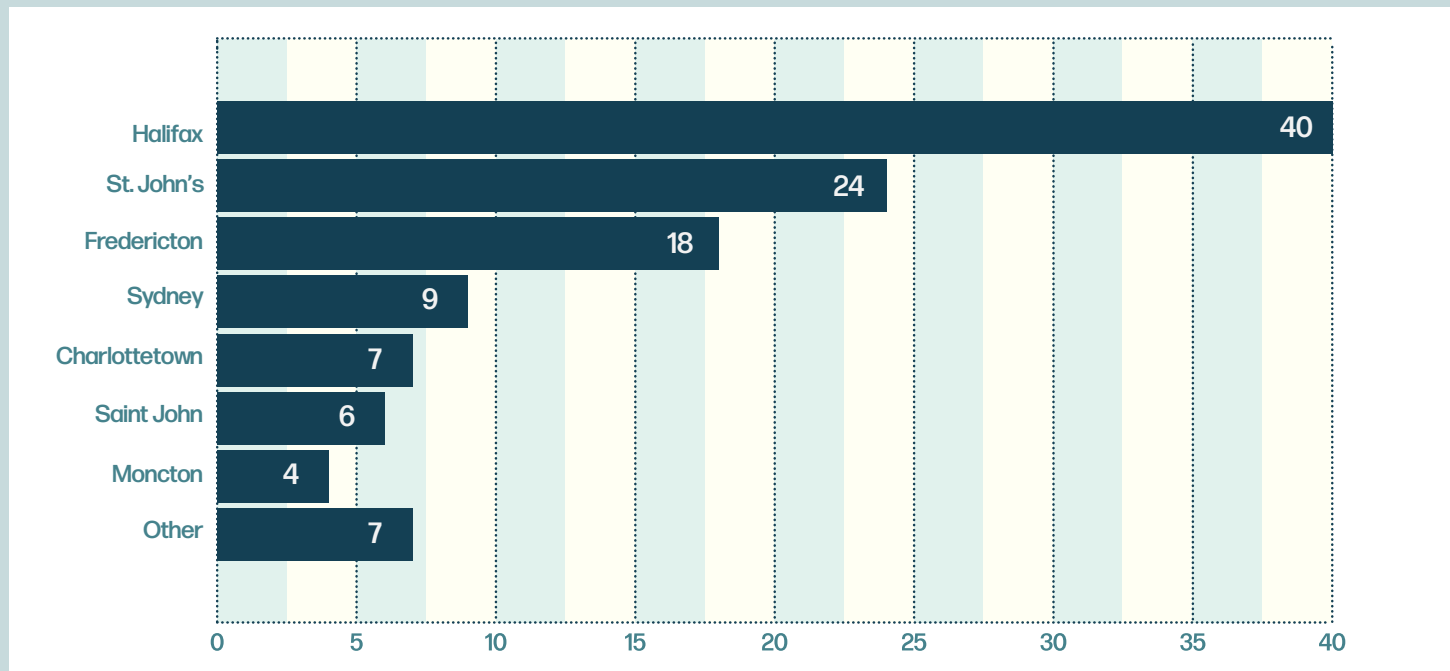
This chart shows that around 2015 or 2016 there was a structural change in the Atlantic Canadian ecosystem. In the first half of the decade, it was common for the region to produce about 60 to 70 new startups. In the second half, it was more common for the number of new companies to be over 100.

There is no single reason for the improvement – rather it is a lot of little changes that have taken place over the past seven years. Several universities now have dedicated entrepreneurship programs, including Memorial University, Dalhousie University, St. Mary's University and University of New Bruns-

wick. In Nova Scotia, there are nine “sandboxes”, which encourage student entrepreneurship. Propel offers a virtual, two-phase accelerator called Incite, the first phase of which established product-market fit for early-stage companies. There are startup hubs in most cities and other centres like Mahone Bay and Yarmouth. Most important, the startup culture has spread throughout the region, enough that anyone who aspires to launch a company can be directed to a group that can help.

An examination of where the companies formed in 2018 reveals a few interesting developments. ■

Chart 2.7 - Location of New Companies, 2018



Source: *Entrevestor Databank*

The most interesting thing about this data is the strength of company formation in St. John's. The Newfoundland and Labrador capital has almost doubled its number of new innovation companies -- up to 24 in 2018 from 13 in 2017. What's more startling is that nine of these St. John's-based companies -- more than one-third of the total -- are in the life sciences sector. That's about 40 percent of the rookie life sciences companies in the region.

The reason for the explosion of healthcare startups in the city is the launch of the Bounce Health Initiative, and the support of Memorial Centre of Entrepreneurship Director Florian Villaum  for healthcare innovation. Bounce is a collaborative effort between MCE, Eastern Health, the MUN Faculty of Medicine and the Newfoundland and Labrador Association of Technical Industries, or NATI. Here's what's interesting: the Bounce process starts with participants asking Eastern Health what problems the province's biggest health authority is facing, then assembling innovators to try to solve the problem. In a short period of time, St. John's has had more success in bringing its medical

community into the innovation process than any other city in the region.

Aside from healthcare, MCE has been crucial in generating new companies, and its Woodward Cup has become a vehicle for giving funding to young ventures. Meanwhile, the Genesis Evolution program provides eight weeks of intensive instruction for companies with less than \$1 million in revenues.

The fact that Halifax and Fredericton are Nos. 1 and 3 in company formation should surprise no one -- they have been the strongest centres in the region for startup development in the past few years.

As we look ahead to the next few years, we believe the driving force for new startups will be growing entrepreneurship among researchers at the region's universities and community colleges. This is happening already, with promising companies like Axem Neurotherapy and Canum Nanomaterials coming out of university research. But the structures for bringing research to market will be stronger in coming years. Three years after startup educator Steve Blank visited Halifax, there is finally a

credible movement to establish a Canadian version of I-Corps, the American group that teaches entrepreneurship to scientists and researchers. Meanwhile, Springboard Atlantic is forming a series of round-tables in select industries to deepen the relationship between the private sector and researchers. The goal is to gain a more thorough understanding of industry problems, and this could lead to new companies to solve these problems. Finally, the Creative Destruction Lab has already begun its "Lab Crawls", in which execs from CDL tour university research facilities and meet with researchers. These complementary initiatives will likely inspire more researchers to consider forming their own businesses.

There is one other thing that's interesting about new companies -- more and more of them are oceantech companies. In 2017, we finally began to see oceantech companies launching in meaningful numbers, and that continued in 2018 with 11 of these companies being formed. We now track 47 companies whose products have marine applications, and 23 of them started in the last two years. ■

The Rookie All-Stars

In our report last year, we set out to dispel the myth that Atlantic Canada may be generating more new companies, but the quality of startup is on the decline. We introduced a list of 10 Rookie All-Stars, displaying new companies that were already showing strength as businesses. The 2017 Rookie All-Star list included several companies that have increased their profiles in their sophomore years: CoLab Software of St. John's has become the first Atlantic Canadian company accepted into the famous Y Combinator accelerator in Silicon Valley. Beauceron Security of Fredericton entered the CyLon accelerator for cybersecurity companies in London. And Rothesay NB-based AVSS entered into a partnership with the National Aeronautic and Space Administration, or NASA, and others on a pioneering project to ensure drone safety in urban environments.

It's worth noting that some new companies "fly under the radar" and don't go public in their early days. For example, the first time we reported on Sonrai was when it raised US\$18.5 million, by which time it was more than a year old. Below is our list of companies launched in 2018 that show promise at an early stage. Rating them here is to some extent a judgment call, but the description should explain why they're drawing attention.

Agyle Intelligence, Charlottetown **David McNally**

Agyle analyzes data for food processors, which have automated the production of food but still gather data manually. CEO David McNally said this simple solution provides a 98 percent improvement in access to manual data and can boost a company's bottom line by \$2 million in a single year. Since launching, the company has tripled customer numbers and had \$500,000 in revenues in the first five months of 2019.

Beyond Food, Halifax **Darren Burke, TJ Galiardi, and Brian Lowe**

Beyond Food reduces food waste by finding supermarket produce that is about to be tossed out and using it to make a nutritional food supplement. It sells nutrition products under the brand TDF Sports. The company raised \$1 million from a range of investors, including several National Hockey League players.

BreatheSuite, St. John's **Brett Vokey**

BreatheSuite has developed software and hardware that aim to correct the improper use of inhalers. If successful, it could improve treatment for the millions of people who suffer from asthma and chronic obstructive pulmonary disease, or COPD. The company was preparing a 30-person test for its product late in 2018.

Byos Cybersecurity, Halifax **Matias Katz**

Byos - which stands for Bring Your Own Security - has produced a device that can be plugged into any computer to automatically safeguard online communications. The solution

is a miniature computer that can be plugged into an internet-capable device and will use artificial intelligence to protect users from security threats. The company graduated in 2019 from the Creative Destruction Lab-Atlantic.

Canum Nanomaterial, Fredericton **Kyle Woods, Alex Clarkin, Francois Michaud, Jayson Brown, and Felipe Chibante**

Canum - which won \$446,000 at the 2019 Breakthru competition - has developed a new, cost-effective way of making fullerenes. These nanoparticles are spherical structures of carbon atoms that have a range of commercial uses, including in healthcare and solar energy. Canum, which grew out of Professor Felipe Chibante's research at University of New Brunswick, believes it can cut the cost of making fullerenes by half in five years.

Coloursmith Labs, Halifax **Gabrielle Masone**

Another CDL-Atlantic graduate, Coloursmith Labs is creating the world's first contact lenses that mitigate colour blindness. By saturating colours, its lenses allow users to unlock a new level of beauty and utility in vision and to enjoy the experience of sight.

iLokol, Halifax **Xi Chen and David Dong**

iLokol offers an e-commerce solution for small and medium enterprises, helping them to connect with local residents more efficiently. It aims to empower SMEs to change their marketing, sales and operation methods. In six months, it signed up 1,500 active users, who spent a total of \$650,000 on the platform.

RIDD L, Fredericton **Jenelle Sobey, Vanessa Paesani, and Jess Peters**

RIDD L has developed a platform that will help impact investors assess the social or environmental effects of their investments. It has arranged pilot tests with impact investment houses in Amsterdam, New York and Atlanta, which will help prepare the platform for a general launch. The company won the \$175,000 second prize at the 2019 Breakthru competition.

TurboPlay, Fredericton **Vince McMullin, John Nguyen, Royal O'Brien and Lisa Weeks**

TurboPlay is building a personalized video game marketplace for indie gamers and game developers, allowing them to sell their digital games and related downloadable content. Its goal is to add more flexibility and convenience into the gaming industry. In mid-2019, it raised \$200,000 from the New Brunswick Innovation Foundation as part of an initial funding round.

Vinocount, St. John's **Jon King**

Serial entrepreneur Jon King and his team have developed an inventory tracking and ordering tool for restaurants and bars. The owners of these establishments can monitor their supplies and sales and order fresh stock from their suppliers. As of May 2019, Vinocount had \$7,000 in monthly recurring revenue, and this figure is increasing by 32 percent monthly.

2.5 Zombies

When we delivered presentations on our data in 2018, one topic always drew questions – zombie companies. We examined the “undead” for the first time in our 2017 report, and found 91 companies that were still going concerns but hadn’t made much headway in a few years. Our comments on zombies meshed with what a lot of people in the community had been feeling – there were too many companies that weren’t moving forward but still tied up human and financial resources.

Given the interest shown in the subject, we set out to be more empirical in our definition of zombies this year. We set out to assess the number of companies meeting these three criteria:

- 1. The company has to be at least two years old. It would be unfair to call a company a zombie when it may simply be in stealth mode.
- 2. It hasn’t made any public announcement in at least two years. There is a chance some companies are simply working quietly on their product, maybe even booking sales on the QT. But prolonged silence is usually a sign of problems.
- 3. It hasn’t raised capital in at least three years. Again, if a company has no visible sales and hasn’t raised capital, there’s a good chance it isn’t moving forward.

We found there were 66 zombies at the end of 2018. It’s a noticeable drop of about one-quarter from the previous year, but it would be imprudent to conclude that things are improving. Many of the zombies from 2017 made their way into our failure list in 2018. And there were several companies launched in 2017 (i.e., under the two-year-old threshold) that we’ve heard nothing from since their launch. We expect they will move on to the zombie list in our 2019 report.

One discussion that has cropped up repeatedly is what are the factors that create zombies. We can’t establish cause and effect, but we can identify some concentrations and patterns in how companies develop. ■

Chart 2.8 - Where Zombies Lurk in Atlantic Canada

The provincial breakdown shows there are higher concentrations of zombies in Nova Scotia and Prince Edward Island than in the other two provinces. But beyond that it is hard to draw conclusions about zombies. Many of them were named in startup competitions several years ago and then went underground – as least as far as Entrevestor can tell. People familiar with these companies insist the founders are still working on the businesses – but in many cases we don’t know what that business is. Is the availability of non-dilutive funding the life support for these companies? We’re not sure. A more likely explanation is that there is a group of entrepreneurs who have faith in their projects, would like to develop them into scalable businesses, but refuse to quit their day jobs to work on them. We notice many of these companies are headed by founders who work at other full-time jobs. That more than anything seems to perpetuate zombies.

Province	Zombies	Concentration*
Nova Scotia	44	15%
New Brunswick	11	8%
Newfoundland and Labrador	3	4%
Prince Edward Island	8	17%

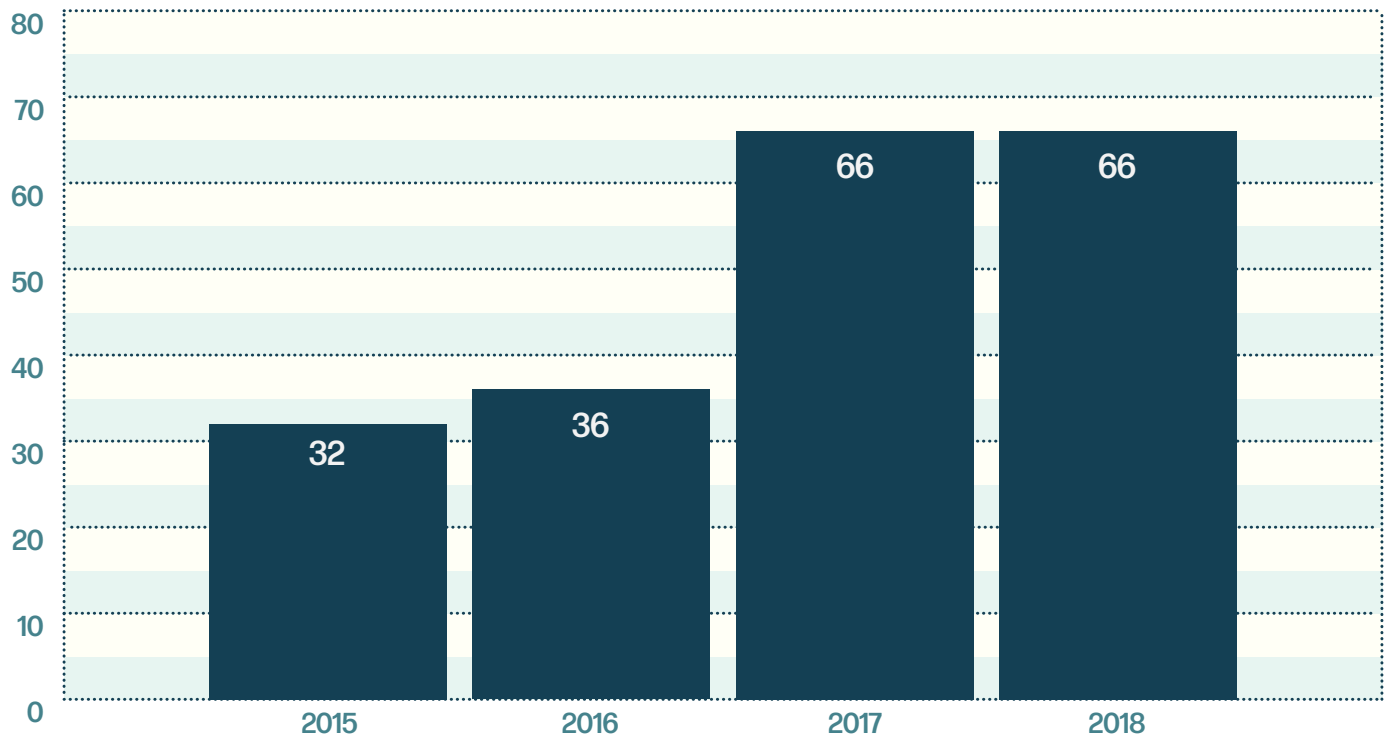
Source: Entrevestor Databank. (*Concentration is the number of zombies expressed as a percentage of the total startups in the province in question.)

As a side note, we carried out another test to indicate how many zombie companies there are. We took all 326 companies that were more than two years old (founded in 2016 or earlier) and calculated how many had grown to more than two employees. The rationale was that if a company is truly growing, it will be hiring people, and that increase will be visible. Many companies post their team on their website, or we could check number of employees on LinkedIn. We found that 97 of the companies had zero-to-two employees – 30 percent of the total. We will stick with our headline figure of 66 zombies, but the examination of staffing again shows we may be underestimating the prevalence of the undead. ■

2.6 Failures

In 2017 we saw a shift in the shuttering of Atlantic Canadian startups – there were almost twice as many failures as in the previous three years. And again in 2018, there were a lot of Atlantic Canadian startups that stopped business – in fact, the exact same number as in 2017. ■

Chart 2.9 - Startup Failures, 2015-2018



Source: *Entrevestor Databank*

As we reported last year, this is good news. In fact, when we delivered our presentations in 2018, there was not a single audience member who expressed any shock that the number of failures is rising. Entrepreneurs, investors and support organizations all expect a certain number of startups to fail. When these companies do close down, they free up human talent for other companies, and ease the demand for financial resources from funders and support organizations. Failures allow the stronger companies better access to scarce resources. We were tracking 486 companies at the end of 2017 and about 14 percent of them closed down within a year. That seems to be a satisfactory level for the startup community.

One third of failures – 22 companies – had launched in 2017, so they never really got off the ground. Many of these were university projects in which the founders simply chose not to continue. (At *Entrevestor*, we believe it's important to account for these companies in the databank because there will always be idea-stage startups that may or may not develop into companies, and they are an important component of the

community.) We counted six failed companies in 2018 that had raised equity capital.

The most notable failure was AIOtv, a Halifax- and Denver-based IT company that had employed 20 people in 2016. The company received \$1 million in funding from Innovacorp, and a year later sold 44 percent of the company to China's UTStarcom Holdings Corp. for \$8 million. One interesting note about the AIOtv failure: The Halifax staff, comprising mainly developers, was told one day in April 2018 that the company would be closing its doors. People familiar with the situation said they began emptying their desks, and within 15 minutes other Halifax tech companies were calling them, inviting them to job interviews. The mere quarter-hour lapse between layoffs to job offers was seen as a sign of the demand for development talent.

As well as the 66 failures, we removed 15 companies from the databank because they are now best considered service companies rather than startups producing a scalable product. And a further five companies left the region. ■

Section 3 – Company Metrics

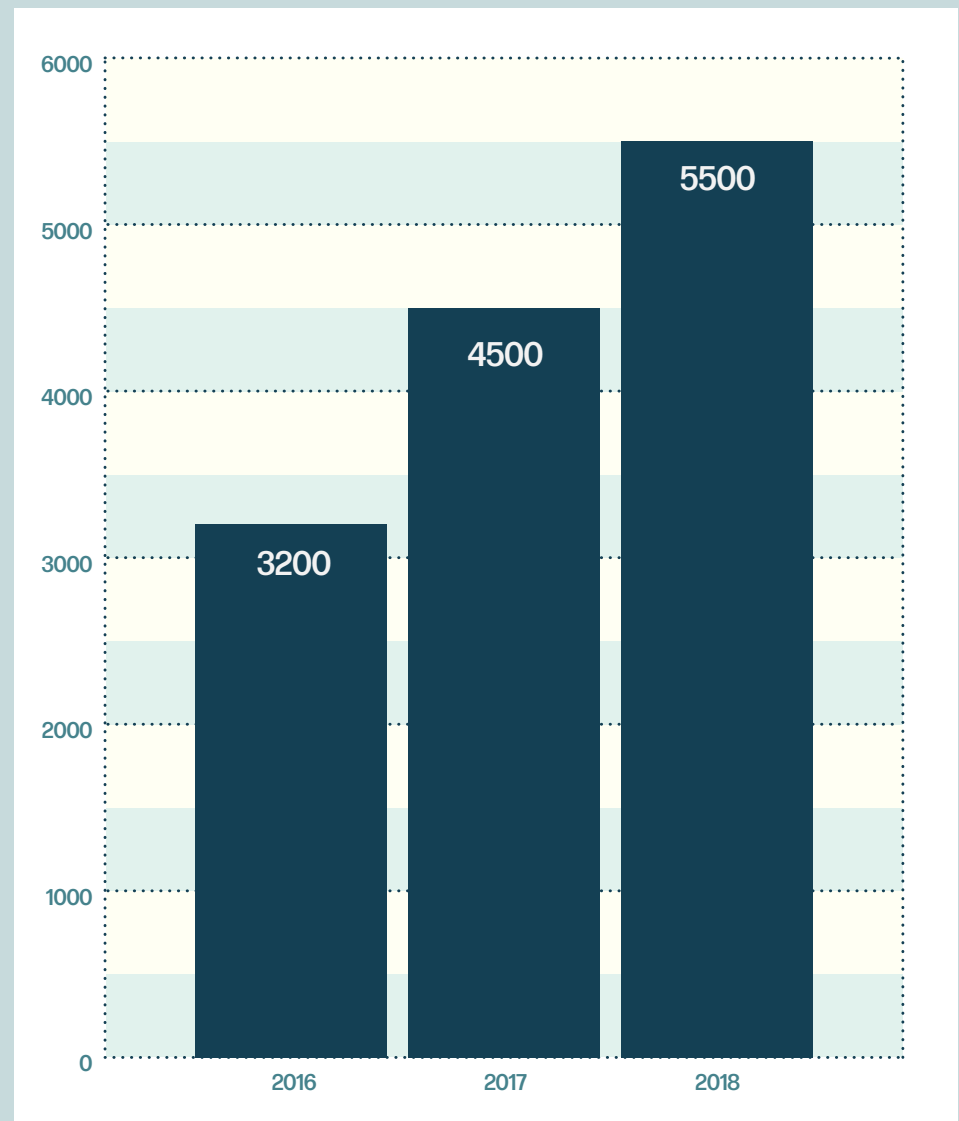
In the previous section, we saw that the number of zombies is a worrying aspect of the Atlantic Canadian ecosystem. But overall, the community is in robust health. There are three main metrics that can reveal the fitness of a group of startups – employment, revenue and funding – and they’re all showing unprecedented strength. ■

3.1 Employment

We calculated that startups directly employed about 5,500 people at the end of 2018 – a 22 percent increase from a year earlier. Meanwhile, we’ve revised out estimate of staffing numbers for the end of 2017 – up to 4,500 from 4,000. (We round off the numbers here, because we’ll never know the precise number.) We admit that’s a major revision for 2017, but after a careful examination we have concluded that we were far too conservative in our estimates last year.

This is especially true in large companies. For example, we had underestimated St. John’s-based Verafin’s growth since its \$60 million private equity deal in 2014. We’d assumed the company employed just over 200 people – about the number from the time of the PE deal. However, the company has had strong growth since that deal and employs well over 300 people. There were other similar revisions. ■

Chart 3.1 - Startup Jobs, 2016-2018



Source: *Entrevestor Databank*

The 22 percent employment growth in the past year has been driven by a few factors. Seventy-eight companies began paying employees for the first time, and by the end of the year they employed 266 people. Five of these companies hired 10 people or more in their first year. At the other end of the spectrum, scaling companies continued to add staff. We estimate 55 companies that had more than 20 employees each at the end of 2017 collectively added about 350 employees through 2018.

The 5,500 headcount is only part of the startup community's impact on employment in Atlantic Canada. Two years ago, we highlighted in our 2016 report the impact that exited companies have had on the economy of Atlantic Canada. We calculated then that 2,200 Atlantic Canadians were working for companies that had bought out startups in the region and grown the operations locally. That number has no doubt increased since then. Cvent, which bought five-employee OneLobby in 2014, has become the most active recruiter of tech talent in the Fredericton area. It had grown to almost 100 people by mid-2018, and then signed a \$385,000 payroll rebate deal with Opportunities New Brunswick to add 25 positions. Similarly, Charlottetown-based drug-manufacturer BioVectra has continued to grow since it was purchased by Questcor Pharmaceuticals of Anaheim, Calif., in 2013. In March 2019, it announced a \$145 million expansion that would add 150 jobs in Windsor, N.S., and Charlottetown.

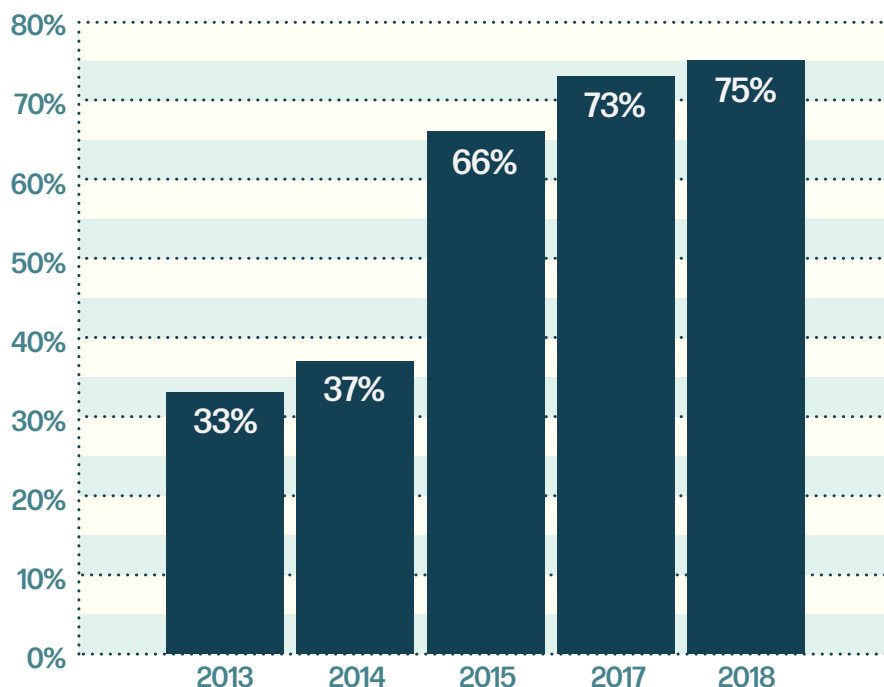
In total, we could conservatively estimate that the exited operations now employ about 2,500 Atlantic Canadians. That would mean that the direct employment by startups and exited operations amounts to about 8,000 people.

There are a few problem spots with employment in the startup community. As we will see in Section 7, some large municipalities like Halifax and St. John's have generated more jobs than places like Sydney and Saint John. What's more, the demand for programmers is acute across the region. The anecdotal evidence suggests that companies in Charlottetown, St. John's and Fredericton are having particular trouble finding developers. ■

3.2 Revenue

Each year that we have done this report, Atlantic Canadian startups' revenue growth has accelerated. This happened again in 2018 - though only slightly. We believe this is the most important data we collect, and it's also the hardest information to unearth. The data we collected shows the East Coast startups increased revenue by 75 percent in 2018, though we also have reason to believe this understates the actual growth. ■

Chart 3.2 - Startup Revenue Growth 2013-2018



Source: Entrevestor Databank (Note: In 2016, we did not collect meaningful data on revenue.)

We asked companies in our survey to provide us with their revenues for 2017 and 2018. If they were not comfortable revealing those numbers, we asked them to provide revenue growth in percentage terms. Many companies chose to skip the revenue questions altogether. There are a few companies that gave us their revenue data through other means, such as in interviews. Here's what the responses revealed:

Chart 3.3 - Revenue Data

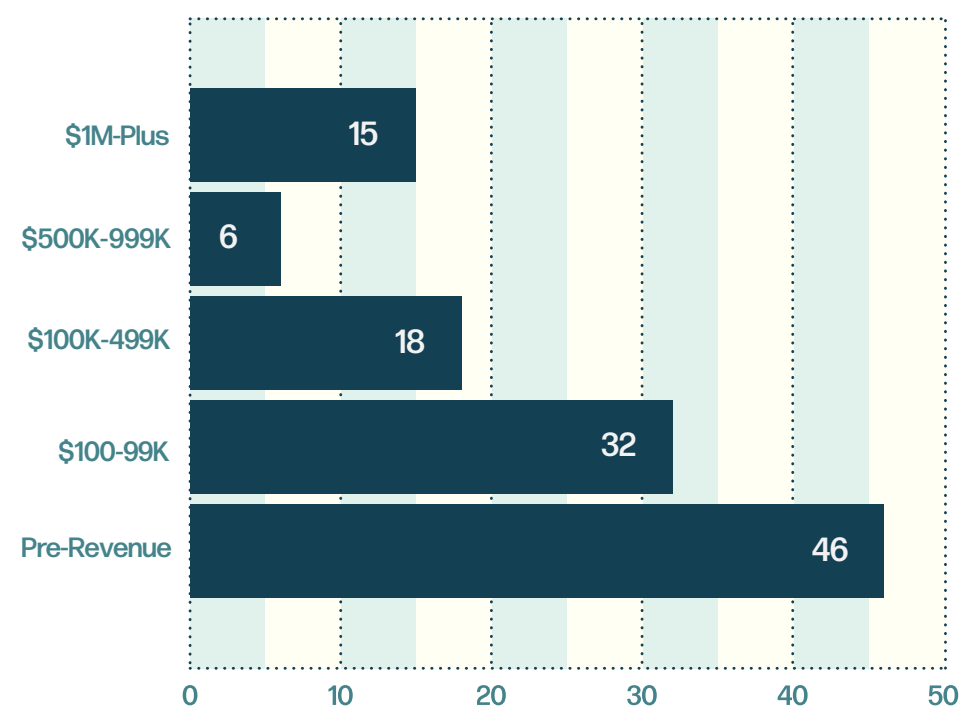
In analyzing revenue from startups, we're dealing with an incomplete data set in an already-complicated situation. But as we pick through it, we can see some trends emerging. We have enough datapoints to draw some important conclusions.

When we consider the 117 companies that provided full data, we can see that we have a great cross section of the startup community. ■

No. of Companies Reporting Revenue Data	117
Pre-Revenue Companies Reporting Full Data	46
With-Revenue Companies Reporting Full Data	71
Total Revenue Reported in 2018	\$45.3 million
Total Revenue Reported in 2017	\$25.9 million
Revenue Growth in 2018	75%
Companies reporting First-Time Revenues	31
Number of Companies Reporting Only Percentage	21

Source: *Entrevestor Databank*

Chart 3.4 - Startups in Each Revenue Bracket, 2018

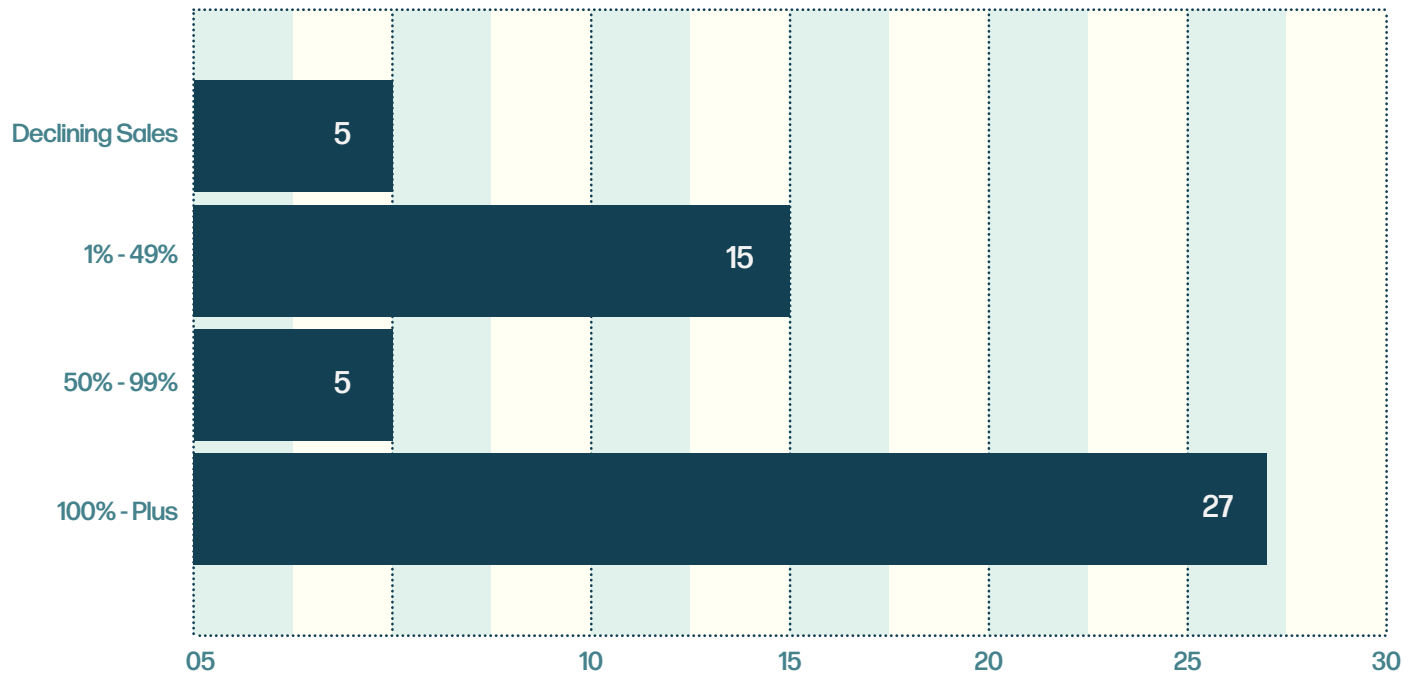


Source: *Entrevestor Databank*

For the second year in a row, we've found that about 13 percent of the respondents booked more than \$1 million in revenues. These companies are growing strongly, with their revenues rising at a weighted average of about 80 percent annually. One worrisome note is that we found fewer companies in the \$500,000-to-\$999,000 band. It could simply be a statistical aberration, but there's always a chance that there's a divide growing between the elite companies and the rest of the pack, with few companies making the jump. One final note: the early-stage companies with revenue between \$100,000 and \$499,000 are the fastest-growing segment of the community, with revenue rising 152 percent last year.

When we look at percentage growth, we see a more encouraging picture. For this exercise, we stripped out all companies with revenue of less than \$100,000, and companies with first-time revenue. And we added the companies that gave us only their percentage revenue growth (which included a broad range of companies). Some 52 companies provided data. What we found is that most companies are doubling their revenue or better. ■

Chart 3.5 - Companies in Each Revenue Growth Bracket



Source: Entrevestor Databank

It's too small a dataset to draw concrete conclusions, but this exercise suggests that more than half of the companies with revenue of \$100,000 or more doubled their revenues in 2018.

Our data, backed up by those from other sources, also highlights that our companies are still too small to make waves nationally or internationally. According to the Branham 300 list of leading tech companies in Canada, the largest tech company in the region in 2018 was the IT service company Mobia Technology Innovations of Dartmouth, which placed No. 115 with \$32.2 million in revenues. In recent years, Atlantic Canada has been left off the Deloitte Technology Fast50, a list of the fastest-growing IT companies in the country. The national Digital Industries Economic Strategy Table has set goals of tripling

the number of companies with \$100 million a year to 172 by 2025, and doubling the number of billion-dollar-a-year companies to 26 in the same time. Atlantic Canada is a long way from participating in this national initiative.

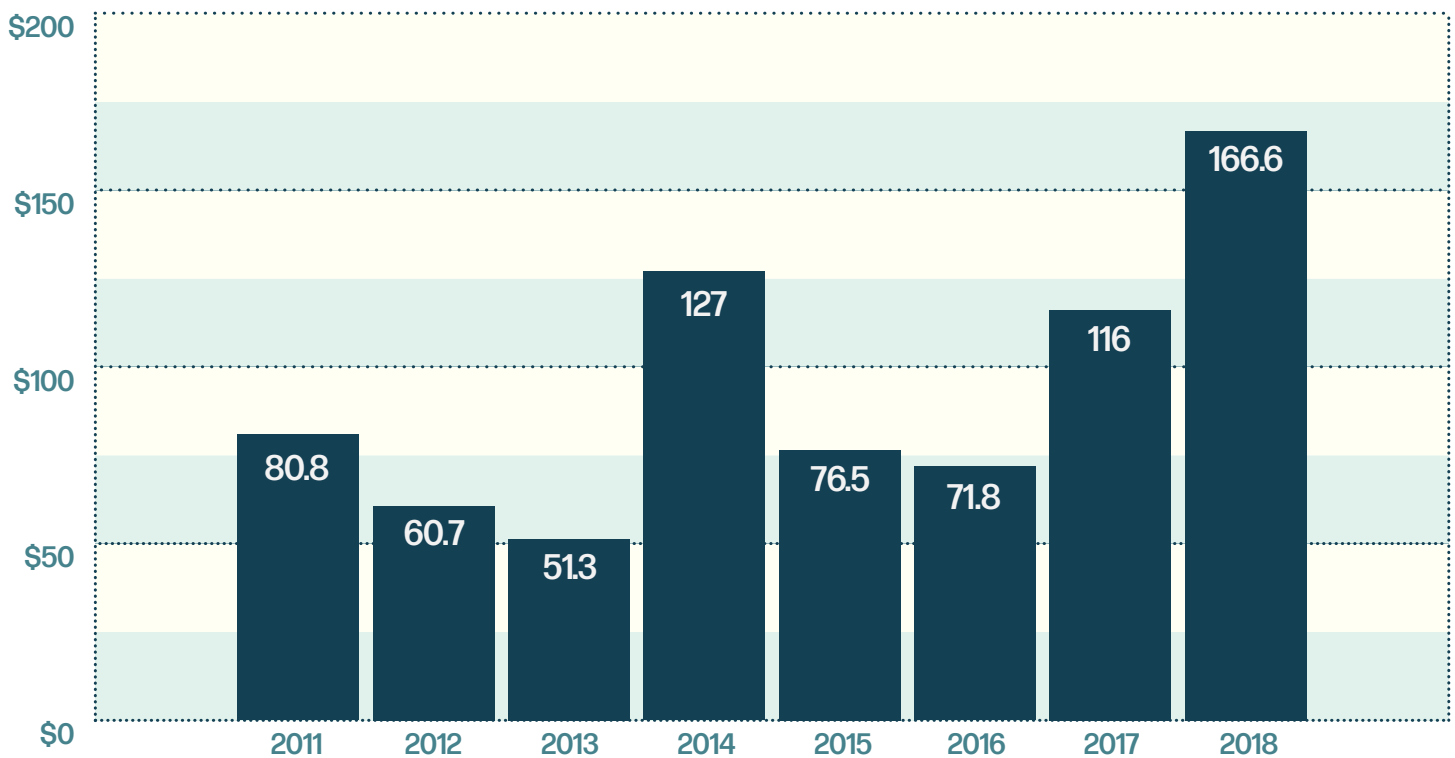
Two final notes on revenue: first, Newfoundland and Labrador is the Atlantic Canadian province with the fastest-growing companies for the second year in a row. NL startups registered revenue growth of 178 percent in 2018 – precisely the same mark as in 2017. And second, the nascent oceantech sector is beginning to show revenue growth already. The absolute numbers are small because the sector is young, but its companies showed revenue growth of 113 percent year on year. ■

3.3 Funding

Atlantic Canadian high-growth companies raised more equity capital in 2018 than ever before. Both Entrevestor and the CVCA agree that this is the case, though we have to admit the details of the funding story are a bit murky. One feature of the funding story in 2018 is a number of rounds that were either not announced or were announced without revealing

the amount raised. We believe the CVCA has a clearer picture of a few big VC rounds than we do. We believe Atlantic Canadian startups raised equity funding of \$166.6 million in 2018, though we admit three big deals are based on second-hand information that the companies would not confirm. It was a record-breaking year. ■

Chart 3.6 - Equity funding by year (M)



Source: *Entrevestor Databank*

What we do know is that the IT sector in New Brunswick drove record funding in the province. Led by mega-deals by Sonrai Security, Introhive and Resson, New Brunswick startups raised \$84.5 million in 2018 – more than they had raised in the previous five years combined. While New Brunswick was the big story, there was also strong investment across the region by angel investors and founders, and the Island Capital Partners investment group began to make investments, which provided a hub for pre-seed investment on P.E.I. What's more, as we show in Section 3.5, funding in the stock market is becoming more prevalent in the region. (Note: Adding stock market data to funding tables is something new in this report, so our headline figure will still comprise five funding sources: founders; friends and family; angels; VC; and strategic. We highlight stock market deals as a separate item that we add on to the total.)

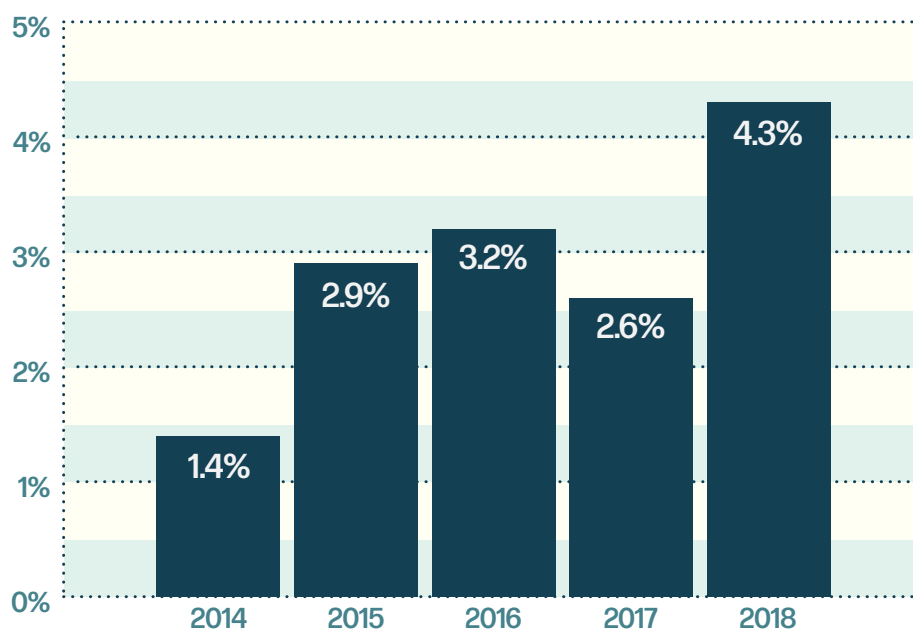
Because there were so many unannounced deals in 2018, especially in Nova Scotia, we should consult the CVCA data for a clear indication of VC funding. At *Entrevestor*, we know of at least five Nova Scotian deals, each worth seven or eight

figures, that were not announced. One of the highest-profile deals was the investment in CarbonCure Technologies in September, led by Breakthrough Energy Ventures. The investment group is chaired by Microsoft Co-Founder Gates, and the investors include multi-billionaires Michael Bloomberg, Jack Ma, Prince Alwaleed Bin Talal, Jeff Bezos and Richard Branson. This deal was obviously a multi-million-dollar deal, but the precise value was never revealed. There were other fundings that *Entrevestor* was aware of but unable to learn the details.

The CVCA – to which fund managers report their deals -- said Atlantic Canada recorded \$158 million in venture capital investment in 2018, accounting for its biggest-ever proportion of Canada's VC funding. It said VC funding in Atlantic Canada rose by 60 percent from \$99 million in 2017, and shattered the previous record of \$103 million in 2016. The four eastern provinces accounted for 4.3 percent of Canada's VC funding last year, beating the previous high of 3.2 percent in 2016. Canadian venture capital had a stellar year in 2018, but Atlantic Canada produced greater growth than any other region. ■

Chart 3.7 - Percentage of Canadian VC in Atlantic Canada

Most years, this report includes a table with the largest funding rounds of the year. This year it is difficult to do because so many of the deals were unannounced. These were the largest funding rounds in Atlantic Canada that were made public:



Source: Canadian Venture Capital & Private Equity Association

Chart 3.8 - Major Funding Deals in Atlantic Canada, 2018

Company	Location	Amount	Lead Funders
Sonrai Security	Fredericton	\$24M	Polaris, TenEleven
Introhive	Fredericton	\$20.5M	Lake Bridge Capita
Resson	Fredericton	\$14M	Mahindra & Mahindra
Proposify	Halifax	\$5M	John Risley, Brendan Paddick
Appili Therapeutics	Halifax	\$4.3M	Bloom & Burton, Angels
Eigen Innovations	Fredericton	\$3.5M	Globalive, BDC, NBIF
BlueLight Analytics	Halifax	\$3.2M	CIC Capital, Innovacorp
Smart Skin Technologies	Fredericton	\$3.1M	Schott AG, NBIF
Empowered Homes	St. John's	\$2.7M	Killick, Pelorus, Others.
Chinova Bioworks	Fredericton	\$2.6M	DSM Venturing, Rhapsody Venture
Harbr	Halifax	\$1.8M	Jevon MacDonald, George Armoyan
Beauceron Security	Fredericton	\$1.5M	NBIF

Source: Company statements

We should also note the increasing importance of founders as sources of investment. In 2017 and 2018, founders invested about \$7.7 million in their own companies each ➡

► year. We can contrast that with funding by founders in 2013-2015, when (stripping out a single \$6 million financing in an established company) funding by founders averaged \$4.3 million per year.

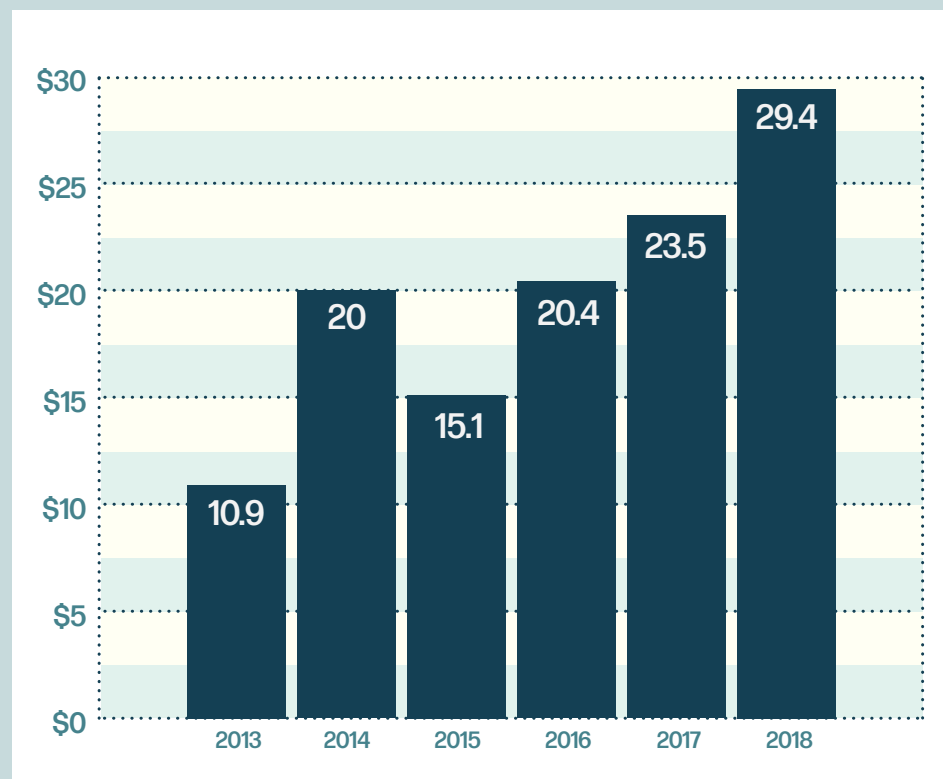
As more and more serial entrepreneurs return to start their second or third companies, they become self-financing entities in the early stages. There also seems to be a greater willingness among first-time entrepreneurs to invest in their own ventures, or the founders of scaling companies to place their own money into their growing businesses. The success of other startups is giving founders more confidence in their own business plans.

Will 2019 be as strong a year for funding as 2018? It could be. The CVCA reported a weak first quarter for equity funding in Atlantic Canada, totalling just \$22.4 million. But the second quarter opened with the largest VC deal ever in the region – ABK Biomedical’s US\$30 million funding round led by Cambridge, Mass.-based F-Prime Capital and Palo Alto, Calif.-based Varian Medical Systems. They were attracted to ABK because of the strength of the management. Anecdotally, we hear of a lot of companies – some large companies – that are raising capital now. VineView told Entrevestor in early June 2019 that it was working on a \$10 million funding round, and already had some commitments. Sixty-three companies told us in our survey that they are now raising capital, and 27 of them are aiming to raise more than \$1 million. In total, these 63 companies are aiming to raise \$99.5 million. ■

3.4 Angel Investing

The great myth in the Atlantic Canadian startup community these days is that there is a problem with angel investing. Our analysis shows East Coast startups are receiving more money from individual investors than ever before -- \$29.4 million in 2018 alone. Here are the totals in the last six years:

Chart 3.9 - Angel Funding by Year (\$M)



Source: Entrevestor Databank

In discussing this data with people, some have countered that the numbers are distorted. Some of the angel funding comes when companies raise a bona fide Series A round from VC investors, they argue, and angel investors jump in to take part. The real problem, these people say, is that there are too few young companies raising \$100,000 to \$500,000 to help bring their products to market.

So we looked through our data to see if they were correct. Once again, we'll emphasize that our funding data is never complete. There will always be companies raising capital on the QT – especially from angels. The actual amount of angel funding very likely exceeds what Entrevestor has learned of. We scoured our databank looking for real “angel rounds” – that is, funding rounds in which angels were the main source of equity capital for young companies. We stripped out two companies that received money from super-angels – individuals who are wealthy enough to be considered institutions. We also stripped out four cases of angel investors piggy-backing on Series A rounds. But we did add in financing from “friends and family”, as these people are tantamount to angel investors. (There was only one deal in which F&F amounted to a substantial sum.)

Here are our findings on “real” angel funding rounds of more than \$100,000 in 2018:

Chart 3.10 - Funding Rounds Dominated by Angels

Number of Companies	38
Total raised from angels/F&F	\$21.2M
Largest round	\$2.7M
No. of rounds of \$1M+	7
No. of rounds of \$100K-\$999K	31
Companies under 3 years old	22

Source: *Entrevestor Databank*

We also examined the funding rounds of less than \$100,000 and found that there is access to capital at this level as well. We found 27 companies closed rounds of less than \$100,000, and 85 percent of these companies were less than two years old. Some received money from sources other than angels – such as Volta Cohort, which invested \$25,000 each in 11 companies in 2018 – but the important thing is that there is access to that small, initial funding round.

So even if we only include “real” angel rounds of more than \$100,000, we find that our startups raised \$21.2 million from angels, friends and family – more than in any year between 2013 and 2016. What’s more, 16 of these companies told us they are now raising again, with a total target of \$35.3 million. The CDL-Atlantic has been effective in bringing in wealthy individuals who are investing in startups for the first time. And entrepreneurs are becoming more adept at courting investors based outside the region. Together, these trends are channeling more angel capital than ever into young high-growth companies.

Angel investing has greatly changed in the past few years. After facing the drag of a law suit from a portfolio company, First Angel Network closed its doors in early 2019. But by this time, it had been replaced as the main meeting place for angel investors by Creative Destruction Lab-Atlantic. CDL Venture Manager Gillian McCrae said the fellows and angels involved in the group have invested \$7 million in the organization’s companies in just two years. ■

3.5 Stock Market

For the first time, high-growth companies in Atlantic Canada are turning in a meaningful way to the stock market as a source of funding. Several forces have converged to make publicly listed companies a more important component of the community.

Atlantic Canadian companies raised more than \$24 million by selling shares and derivatives on the stock markets in calendar 2018. That's almost as much as the \$29.4 million raised from angel investors, which we've already shown was a strong performance.

There are not a lot of transactions by the publicly listed companies, but the recent ones have been noteworthy:

- In August, Halifax-based Sona Nanotech listed on the Canadian Securities Exchange, choosing the alternative exchange rather than the TSX Venture exchange. The company raised \$2 million during the listing.
- Kraken Robotics of St. John's closed a \$2.3 million sale of shares and warrants to its customer Ocean Infinity in June. The company then raised further capital in December when it sold \$6 million worth of shares.
- In February, Halifax-based IMV announced that it had closed a bought deal to raise \$14.4 million. The share sale was successful and the financial groups working on the deal exercised their over-allotment options in full.

Barring a stock market crash (which is a real possibility at this point in the economic cycle), the stock market will become an increasingly important facet of the Atlantic Canadian startup community. In March 2019, IMV closed another share sale, which raised an additional \$26.7 million. Appili Therapeutics, a fast-growing drug discovery com-

pany based in Halifax, listed on the TSX Venture Exchange in June 2019. Metamaterial Technologies Inc. is planning a CSE listing in September. Saeed El-Darahali, the CEO of Dartmouth-based multi-channel marketing company SimplyCast, has been talking for years about his intention to seek a public listing. And other companies like BlueDrop Performance Learning of St. John's and Exeblock, a Halifax blockchain company, are also listed.

The driving force behind this interest in public listings is the longevity and strength of the current bull market. Eleven years have passed since the financial crisis and the stock market seems like a dependable and profitable place to raise capital. The Canadian tech sector has performed well and investors are looking for small tech companies the way they used to look for penny stocks in the mining and oil and gas sectors. After languishing for years, the IMV shares rose in 2017-2018 and the company is leading the way for other Atlantic Canadian innovators to test the markets. ■

Section 4 – Sectors

Since we began conducting these studies in 2014, information technology has dominated the community in terms of number of companies, revenue and funding. That didn't change in 2018. IT companies accounted for almost two-thirds of the startups in our databank – the same level as in 2014. The sector that has shown the most growth in the past few years is life sciences. It accounted for 16 percent of the startup community in 2014, and has moved up to 21 percent, largely at the expense of advanced manufacturing.

One note about our data on oceantech companies: For the past few years, we have divided the community into four sectors – IT, life sciences, cleantech and advanced manufacturing. We've continued to do this as the oceantech sector has grown. Every oceantech company fits into one of the other categories. So oceantech does not appear in sectoral breakdowns of the community. We simply have a separate section on companies with ocean applications. ■

Chart 4.1 - Startup Community Sectors, 2018

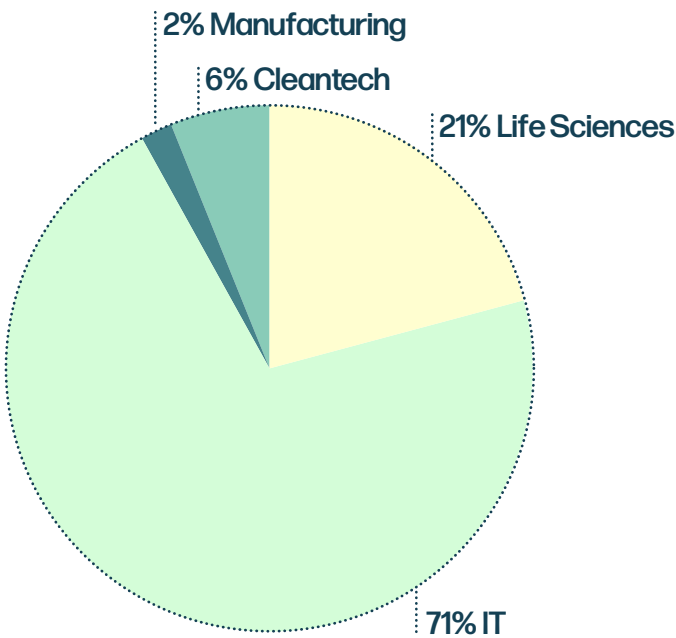
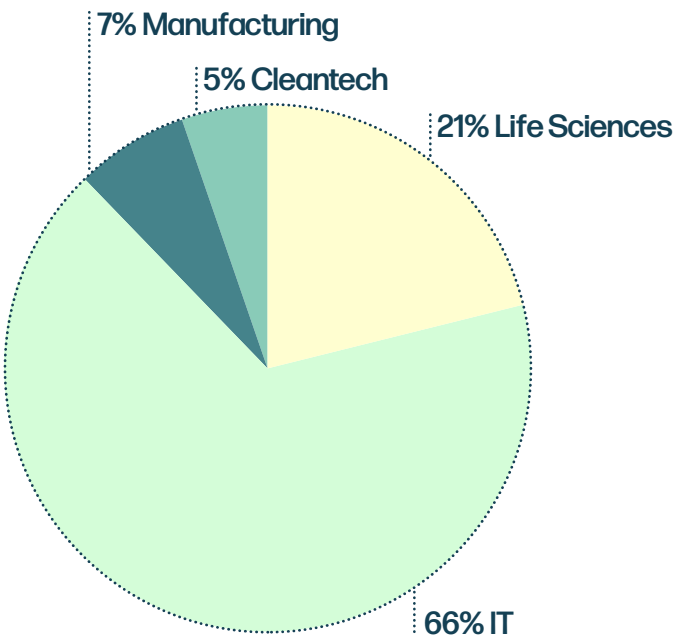


Chart 4.2 - Funding by Sector, 2018



Source: Entrevestor Databank. (Note: The funding data includes capital raised through stock markets.)

If IT has a heavy weighting in terms of number of companies, it absolutely dominated in terms of funding. In a record year for funding, IT accounts for 71 percent of the funding raised. (The figure was 76 percent if we strip out stock market funding.) To put that in perspective, Atlantic Canadian IT companies raised two-and-a-half times as much funding in 2018 as all startups in the region raised in 2013. ■

4.1 Information Technology

Chart 4.3 - IT Fact Box for 2018

Number of Companies	365
Funds Raised	\$128.7M
Stock Market Funding	\$8.3M
Number of Jobs	3,519.5
Job growth	24%
Revenue growth	86%

In any given year, information technology will account for the lion’s share of activity in the Atlantic Canadian startup community. In 2018, it accounted for 71 percent of the money raised and 64 percent of the headcount. IT companies just keep galloping forward.

Another oddity is that there is no single area of strength in the region within the digital industries. App development, artificial intelligence, data analytics, blockchain – there are smatterings of all of them across the region. The only concentration we really see is the cybersecurity community in Fredericton. The headquarters for IBM’s global cybersecurity R&D network is in Fredericton. There are now 60 people working at the Canadian Institute for Cybersecurity, which is just three years old. And private cybersecurity companies are growing rapidly, ➤

► including Sonrai Security, which raised US\$18.5 million in 2018, and Beauceron Security, which raised \$1.5 million.

IT has a capacity for growth that is unrivaled in the other segments, and several Atlantic Canadian companies are showing its power. Verafin of St. John's, which received \$60 million in private equity funding in 2014, has not slowed since its transformative deal, and now employs well over 300 people. Affinio of Halifax was accepted into Microsoft's new Intelligent Customer Journey for Retail project. Manifold, also of Halifax, was named to the 2018 Narwhal List, which assesses the "financial velocity" of companies (meaning how quickly they're raising large amounts of money). In its first announcement ever in early January 2019, Fredericton's Sonrai Security said it had raised a record US\$18.5 million in venture capital from American funders. Two other Fredericton IT companies, Introhive and Resson, also announced eight-figure funding deals in 2018. ■

4.2 Life Sciences

Chart 4.4 - Life Sciences Fact Box, 2018

Number of Companies	118
Funds Raised	\$23.4M
Stock Market Funding	\$16.4M
Number of Jobs	1,295
Job growth	25%
Revenue growth	91%

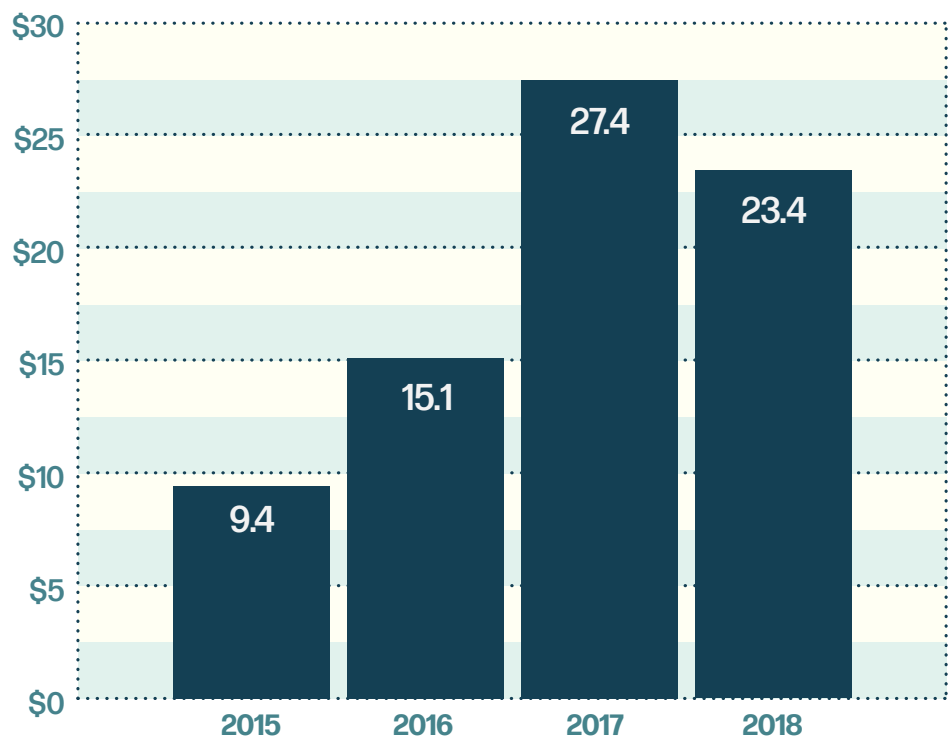
The life sciences segment – both the companies in the group and the ecosystem that supports them – is making some of the strongest progress in the region. This sector showed high growth in employment and revenues, and is at the vanguard of East Coast companies seeking stock market listings. It also saw the greatest success in generating new companies – there were 24 new life sciences companies in 2018, up from six in 2014. One-fifth of the region's biotech companies were launched in 2018. The progress is continuing in 2019 as ABK Biomedical raised a record US\$30 million venture capital round, even though the company has yet to book revenues.

Finding a theme in this sector is difficult because there are several initiatives taking place across the region. On Prince Edward Island, the PEI BioAlliance continues to build up its community with a special emphasis on pet health and natural products. Its private corporations now account for more than \$215 million in annual revenue. The BioAlliance's Emergence incubator is growing into a more regional initiative. In Nova Scotia, BioNova has produced its BioFuture 2030 report, which sets out a roadmap for doubling the sector or better. It plans to triple employment to 4,100 jobs and quadruple revenues to \$1.1 billion. It is also calling for new ecosystem initiatives, such as an accelerator to teach sales to life sciences companies. Newfoundland and Labrador is beginning to launch more life sciences companies as the Bounce Health Initiative is nurturing partnerships between innovators and the medical community. (See Section 7.4.)

These provincial groups are now working together more than ever before, as the life sciences group of the Atlantic Growth Strategy is bringing them together to work on common goals. BioNB, BioNova, the Newfoundland & Labrador Association of Technology Industries and the PEI BioAlliance are all working together in the Atlantic Canada Bio-Industries Alliance. This group is already at work, bringing together 20 companies and organizations in early 2019 to attend the 2019 BIO International Convention and Trade Show in Philadelphia

As well as the ecosystem changes, there are some great companies pushing forward. Drug discovery company Appili Therapeutics continues to raise money and grow its team, and listed on the TSX Venture exchange in June 2019. Adaptiv, which 3D prints boluses for cancer treatment, and Densitas, whose software measures breast density during mammograms, are both making sales. Picomole has resurrected to raise money and work again on its cancer detection device. Mara Renewables is producing its Omega-3 food supplements from algae and now employs 60 people. ■

Chart 4.5 - Life Sciences Funding (\$M), 2018



Source: Entrevestor Databank

Funding of life sciences companies rose to a new plateau of more than \$20 million per year in 2017 and 2018. The US\$30 million funding round announced by ABK Biomedical will ensure that funding sets a record in 2019. What's remarkable about the funding rounds is that most of the funding ecosystem is not well suited to biotech companies. Several funds have a limited lifespan and little appetite for regulatory risk. ■

4.3 Cleantech

Chart 4.6 - Cleantech Fact Box 2018

When the international consultancy Cleantech Group announced its list of the top 100 cleantech companies in the world in January 2019, two Halifax area companies made the list. Dartmouth-based CarbonCure Technologies, which is working to reduce the carbon footprint of the concrete industry, and Halifax-based Metamaterial Technologies, which has developed a new class of synthetic materials, were selected from over 13,000 innovators from more than 90 countries. They were among 12 Canadian companies named by the panel of 87 judges.

Consider that for a moment. This San Francisco outfit with global reach scanned the world for the best companies for aiding the environment, and two are based in an Atlantic Canadian city with a population of about 425,000.

Number of Companies	30
Funds Raised	\$12.5M
Number of Jobs	247.5
Job growth	20%
Revenue growth	28%

It shows that Atlantic Canada is developing some powerful players in the cleantech space. Companies like CarbonCure, MTI and LED Roadway Lighting have grown to a size at which they are gaining international clients and attention.

This is a small sector with a huge gap between the bigger and smaller players. It is often perceived as a capital-intensive industry with a slow payback period, which can pose a challenge when raising funds. The greatest improvement in the cleantech ecosystem in the past two years is the creation of Energia Ventures, whose specialties include green energy. ■

4.4 Advanced Manufacturing

Chart 4.7 - Manufacturing Fact Box, 2018

Number of Companies	40
Funds Raised	\$2.9M
Number of Jobs	446.5
Job growth	10%
Revenue growth	293%

Collecting data on advanced manufacturing is difficult because there is often such a fine line between manufacturers and IT companies. All advanced manufacturers rely on software (and increasingly on machine learning and artificial intelligence) to keep ahead of their competitors. And many IT companies have a hardware component to complement

their software. We could add that many manufacturers are working on products that could also fit into the life sciences or cleantech segments. But we have chosen 40 companies whose main business is “making things” – things you can touch, usually packed with electronics.

The sector had a year of modest job growth and weak financing. The most eye-catching number associated with this segment is the revenue growth – 293 percent. We received revenue data from eight manufacturers, six of them with profits. Four of these either had revenues for the first time, or had recorded negligible revenues in 2017. Thus the huge jump in revenues in 2018.

One final note about the manufacturing segment is it could gain a boost from the development of the ocean industry in Atlantic Canada. Almost one-fifth of the ocean technology startups are manufacturers, compared with about 7 percent of the overall startup community. If the oceantech segment continues to gain steam, it could benefit the manufacturing cluster. ■

4.5 Ocean Technology

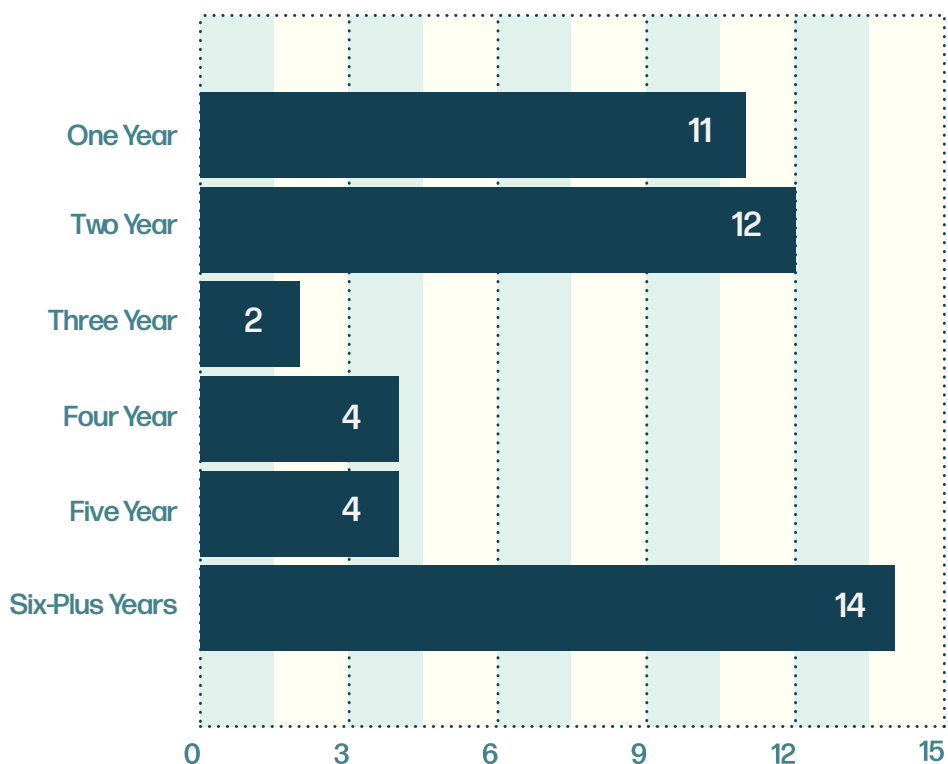
Chart 4.8 - Oceantech Fact Box

In 2018, Matt Zimola and Hossein Salimian were post-graduate students in Dalhousie University’s Faculty of Computer Science searching for an idea for a startup. Their professor Thomas Trappenburg suggested they look at something in the oceantech sector, which seemed to be hot. Thus, ReelData was born. This startup uses artificial intelligence to collect and analyze data for fish farms, helping to automate manual processes like feeding fish. ReelData is already carrying out pilot projects in Scotland, Denmark, the U.S. and Mexico, and will generate initial revenue in the fall of 2019.

The story of ReelData shows how young innovators – even those like Zimola and Salimian with no background in marine industries – are turning their attention to the ocean technology segment. In our report last year, we highlighted that oceantech startups were beginning to form in a meaningful way in Atlantic Canada. That trend continued in 2018, with particular strength in Nova Scotia. More than half of the companies in this sector are less than three years old, but they’re already showing growth metrics. We believe they employ more than 700 people, and their revenue growth is surprisingly strong. Seven companies (15 percent of the sector) shared revenue data with Entrevestor, and they display strong growth, even though most were just beginning to build up their client base. Funding in this sector is modest and driven by angels, with VC accounting for less than \$700,000. ■

Number of Companies	47
Funds Raised in 2018	\$8.3M
Number of Jobs	712.5
Job growth	21%
Revenue growth in 2018	113%
New companies	11

Chart 4.9 - Age of Oceantech Companies



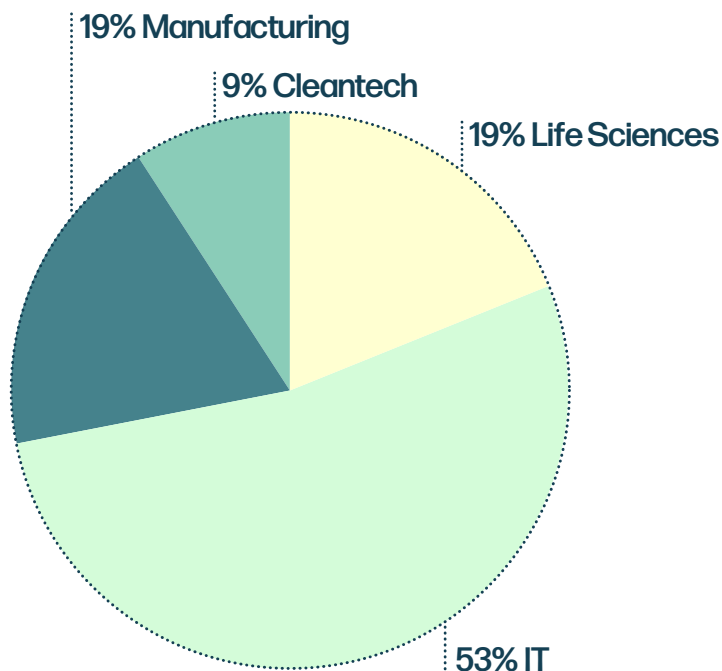
Source: Entrevestor Databank. (Note: One-year-old companies were those established in 2018.)

The important development in the oceantech space in 2018 was the improvement in the ecosystem for these companies. The COVE Startup Yard opened and is already assisting a range of businesses. The CDL-Atlantic is working with oceantech companies from Atlantic Canada and other parts of the world – its 2018-2019 cohort included companies from Ireland and Denmark. And Canada's Ocean Supercluster has named Kendra MacDonald of St. John's as its CEO, as well as hiring other staff.

Some people believe the next phase in the ecosystem will be to determine an area of specialization for the Atlantic Canadian ocean industries segment. There are more and more oceantech hubs growing around the world, such as the Marine & Oceanographic Technology Network in Boston, the Marine Technology society in San Diego, and the National Oceanography Centre in the U.K., to name a few. With the number of oceantech hubs growing, some believe Atlantic Canada will have to distinguish itself by specializing in a sub-sector, such as marine life sciences. ■

Chart 4.10 - Oceantech Subsectors 2018

The question of which sector to focus on is a difficult one. Atlantic Canada is already producing some impressive companies that operate at the intersection of oceantech and life sciences. These include Cuna del Mar, Mara Renewables and Acadian Seaplants. But in terms of absolute numbers, the region is launching a lot of companies producing hardware suitable for maritime environments. ■



Section 5 –

Exits and Transactions

In our 2016 Atlantic Canadian Startup Data report, we produced a detailed study of the exits by innovation companies in the region that had occurred since Radian6 was purchased by Salesforce.com in 2011. We said that from early 2011 to February 2017, Atlantic Canada startups had produced 27 exits, and estimated that generated a total capital of \$1.8 billion. Five of these deals were worth \$100 million or more – Radian6 (\$326 million), Q1 Labs (reportedly more than \$600 million), Ocean Nutrition Canada (\$540 million) BioVectra (\$100 million) and STI Technologies (reportedly \$200 million).

The report was well received and readers said that hopefully there would be more deals, and big deals. The goal is to produce huge returns so angel investors will have capital for further investments, and serial entrepreneurs (with capital of their own) can eventually start new companies.

In the past few years, we've been getting more deals, but none has been the blockbuster that the market was hoping for. Most exits are reported without a price tag, so it's impossible to produce data on the size of exits. However, it would appear we're getting more smaller deals.

From 2011 to 2015, some 18 startups exited, for an average of about 3.6 exits a year. These included Radian6, Q1, ONC and Bivectra. From 2016 to 2018, there were 25 deals, or about 8.3 per year. It would appear that only the STI sale was worth nine figures. The biggest sale we know of in 2018 was the sale of Panag Pharmaceuticals, which was worth as much as \$27 million. These smaller exits still have the potential for great economic impact. The sale of OneLobby, for example, was a small deal involving five employees, but today the buyer Cvent employs more than 100 people in Fredericton.

Here are the eight Atlantic Canadian companies (including one that left the region but still rewarded its Halifax-based investor) that exited in 2018:

Adfinitum Networks

St. John's-based Adfinitum Networks – which did business under the trade name Global Ad Source – sold out in October for an undisclosed price to a publicly listed British company, which declined to be named. The St. John's company owned an advertising database used by some of the world's largest brands. Global Ad Source, which had raised money from GrowthWorks Atlantic and angels, will maintain its brand name and continue to operate out of St. John's with its team intact under the leadership of CEO Ed Clarke.

EhEye

In November, Saint John-based EhEye, which developed video recognition software for public security, was purchased by Patriot One Technologies of Toronto for more than \$3.2 million in stock. Patriot One said it would integrate the New Brunswick company's software, which allows video surveillance systems to recognize guns or other threats, with its Patscan weapon-detection system. Founded by President and CEO James Stewart, EhEye had reached the point at which it was about to pilot its technology at two different locations, but the company needed capital. By folding the company into Patriot One, Stewart and his team will gain the support of a publicly listed company whose stock rose 78 percent in the 12 months leading to the acquisition. EhEye had received investment from New Brunswick Innovation Foundation.

Envenio

Fredericton-based Envenio, whose technology assists in the understanding of fluid dynamics, was quietly bought in November by San Francisco electronic cigarette company Juul. Juul, which had US\$1.1 billion of revenue in fiscal 2018, acquired Envenio because it is a specialist in computational fluid dynamics, or CFD, meaning its software helps engineers understand how fluids move. (Though most of us think of fluids as liquids, they can also be gases, solid particulates or anything else that flows.)

Growing out of intellectual property developed at the University of New Brunswick, Envenio's algorithms allow basic computers to simulate the flow of these substances. Like a virtual wind tunnel, it can chart the interactions of liquids and gases in specific conditions and with certain solid shapes. In 2017, Envenio secured \$1.3 million in venture capital investment from Celtic House Venture Partners, Green Century Investments and NBIF.

Kivuto Solutions

Ottawa-based Kivuto, which makes educational software, received an investment from Innovacorp in the 1990s, and paid out a return of 12 times through dividends and its exit in March 2018. CEO Ram Raju founded what was then known as e-Academy in Halifax in 1997 to simplify the management and distribution of software in higher education. Two years later, Innovacorp invested in the company, and not long after that Raju moved the company to Ottawa, changing its name to Kivuto. Now the company has been sold in an equity-and-debt buyout put together by Calgary-based Legado Capital and Roynat Equity Partners, which is a subsidiary of Scotiabank.

Marcato Digital

Marcato Digital Solutions, the Sydney company that provides administrative software for music festivals, was acquired by Pittsburgh-based Patron Technology for an undisclosed sum in October. Patron provides customer-facing software such as ticketing, marketing and fan engagement, to entertainment clients and others. The company will offer a broader range of products to clients now because Marcato (another Innovacorp portfolio company) specializes in back-office functionality, such as credentialing, artist advancing, asset management and catering. The buyer retained most of Marcato's 13-mem-

ber team in Sydney, while Founder Darren Gallop had already moved on to his next startup Securicy.

Nautilus Biosciences Canada

Charlottetown-based Nautilus Biosciences Canada, a marine biotechnology company, was purchased in June by the British specialty chemical-maker Croda International Plc for an undisclosed price. Founded in 2007 by University of Prince Edward Island Professor Russell Kerr, Nautilus focuses on using marine microbial organisms to discover new bio-medical materials and other products. East Yorkshire-based Croda plans to use Nautilus' operations and patents for applications across all its market sectors. Including the UPEI lab it works with, Nautilus had a staff of about 30 people at the time of the acquisition.

Panag Pharmaceuticals

Halifax-based Panag Pharma, which is making pain-relief products from natural compounds found in cannabis plants, agreed in November to be bought for as much as \$27 million by Ontario's Tetra Bio-Pharma. Based in the Ottawa suburb of Orleans, Tetra is a drug discovery company that specializes in developing treatments based on such compounds – known as cannabinoid-based drug discovery.

The Panag Team – which is led by healthcare professionals Mary Lynch, Melanie Kelly, Bill Cheliak, Orlando Hung and Christian Lehmann – will continue to conduct research into cannabinoid-based treatments for Tetra, and receive extra payments for hitting specific milestones. The buyer, which paid cash and stock, said it believes it will gain revenues from Panag's products by late 2019.

WoodsCamp Technologies

WoodsCamp Technologies, the Lunenburg, NS, company that helps woodlot owners manage their lands responsibly, was acquired by Washington, DC-based American Forest Foundation in June for an undisclosed sum. Co-Founders Alastair Jarvis and Will Martin said the company and its technology platform were bought by the AFF, a conservation non-profit organization that specializes in family forests. WoodsCamp and AFF began working together in late 2017 and the American group rolled out the WoodsCamp product in state-wide programs in Alabama and Wisconsin before the acquisition. WoodCamp enlarged its Nova Scotia team after the acquisition.

We could add one other company to the list of exits, though it did not involve a buyout. Halifax-based life sciences company Sona Nanotech began trading on the Canadian Securities Exchange in October, effectively allowing its shareholders to exit if they chose to. The company raised \$2 million through the sale of shares in the process of listing. The company, which produces gold nanoparticles that can be used for various healthcare tests, spent a year working toward a stock market listing to raise capital and increase its visibility. The shares were listed with a bid price of 25 cents, which would give the company a market capitalization (the total value of all its shares) of \$14.6 million. ■

Section 6 – Corporates and the Startup Community

6.1 The Need for Corporate Innovation

Since we began reporting on the growth of startups in Atlantic Canada in 2011, we noticed a yawning gap between the traditional industries and startups. People in traditional industries seemed mystified by these companies, delighted that they were growing but confused by how they worked. These new companies were headed by kids in running shoes, had weird names and attracted millions of dollars in funding even before they had revenues. The mystification was mutual. Startup founders couldn't figure out why established Atlantic Canadian businesses grew so sluggishly and conducted so little research and development.

One thing the startup founders were right about was the dearth of corporate R&D in Atlantic Canada. The Conference Board of Canada in 2018 awarded all four Atlantic Provinces a grade of D-minus for innovation, and the same score for business research. (The Conference Board did not say what the D-minus in business research means, though in previous years it awarded such a score for enterprise R&D to jurisdictions that spent less than 0.4 percent of GDP on private sector R&D.) The following table shows the spending levels in enterprise R&D for 2014, the most recent figures available publicly. ■

Chart 6.1 - Percentage of GDP Devoted to R&D in 2014

Province	Enterprise R&D	Public R&D
Nova Scotia	0.35	1.20
New Brunswick	0.31	0.67
Newfoundland and Labrador	0.38	0.76
Prince Edward Island	0.30	0.87
Canada	0.90	0.76

Source: Conference Board of Canada

Simply put, Atlantic Canadian corporations have spent too little on research and development, even by the low standards of Canada. (The Conference Board rates Canada 12th among 16 peer countries in innovation.) Obviously, senior executives at Atlantic Canadian corporations would have benefited from spending more time with innovators.

The innovators would benefit as well, given that there is a wealth of business experience and capital within the region's corporations, and the neophyte startup bosses would do well to tap both. In his book *Startup Communities: Building an Entrepreneurial Ecosystem in Your City*, startup guru Brad Feld speaks of "tent-pole industries" as one of the essential components of a startup community. The word "tent-pole" suggests that these corporations rise and lift everything around them, including startups. Corporations provide mentorship and investment, and their employees often leave to start their own companies. Atlantic Canada doesn't have a lot of corporations, so it's in startups' best interests to build ties with those that are here.

Over the past two years, the chasm narrowed for several reasons. A few giants among the region's richest families have devoted a lot of time and resources to startups, namely the McCains, Mark Dobbin and John Risley. McCain Foods employs a full-time Startup and Entrepreneurship Lead, Nestor Gomez, who is respected throughout the startup community. In 2018, McCain made its second investment in Fredericton-based Resson as part of a \$14 million equity funding round. McCain Foods also works with Fiddlehead Technology of Moncton and Eigen Innovations of Fredericton. Early in 2019, McCain took over the management of Halifax-based TruLeaf Sustainable Agriculture, another company it had invested in.

Meanwhile, John Risley has become a super angel. Since his company Ocean Nutrition Canada exited for \$540 million in 2012, he has become a major investor in such high-flying companies as Proposify and Kinduct. And Dobbin, the head of Killick Capital, is one of the most active investors in the region. More recently, the Creative Destruction Lab-Atlantic has marshalled together many of the region's business leaders and named them "fellows" or "associates". These people champion certain companies going through the program, and are asked to invest in several of them. While providing \$7 million for Atlantic Canadian startups in its first two years, CDL has also nurtured ties between startups and experienced business people. For example, Halifax-based construction software company Harbr lists several investors on its website who are involved in the real estate industry, and these relationships came from CDL. Former Emera CEO Chris Huskison became

a board member of Mysa Smart Thermostats after meeting the St. John's company at CDL.

One fellow, Geosam Capital President George Armoyan, told Entrevestor these relationships benefit both the fellows and the startups. "They should be looking at it more," Armoyan said of the traditional business people. "Most of us traditional industry guys are technology laggards so you have to have the desire and willingness to look at new things, to expand beyond your own experience. For me, it's like going back to school again. You learn a lot."

In our report this year, we set out to assess the growing links between corporate Atlantic Canada and the startup community. We asked our survey respondents to list the corporations they worked with to gauge the cooperation between the two groups. Thirty-four of the 157 respondents (22 percent) listed corporate partners. We've had to edit this list as some of the responses listed contractors paid by the startups rather than corporations they are working with. In the end, we found that 24 companies – 15 percent of the total – were partnering with established businesses. This is not a huge data set – probably an indication of how few Atlantic Canadian startups are working with corporate partners. Data tables would likely be misleading with such a small data set. But here are three conclusions we have drawn from the exercise.

1. Atlantic Canadian utilities are far more involved in the startup community than they receive credit for. Three startups listed a total of eight utilities as their partners.
2. New Brunswick companies did better in the survey than other provinces. McCain Foods and NB Power were the most frequently cited corporations with three references each, while companies in the Irving group were mentioned twice. This is no accident. For years, the NB Business Council board meetings began with presentations from startups. Startups have been more part of the New Brunswick business community than is the case in the other provinces.
3. Finally, we were surprised by the number of small and medium-sized businesses working with startups. There were nine SMEs mentioned by respondents in our survey, and there are public examples of smaller businesses working with startups. In Sydney, Snow White Laundry was an early adopter for Tracker Inventory Services, having been introduced through the Intersect program. In New Brunswick, Wellness Connections has served as an early adopter and evangelist for the startup Routinify. ■

Section 7 – Provincial Data

7.1 Nova Scotia

Chart 7.1 - Nova Scotia Fact Box 2018

Number of Companies	290
Funds Raised	\$67.1 million
Number of Jobs	2,781
Job growth	26%
Revenue growth	67%
Elite Companies	21
Scaling companies	20
New companies	54
Failures	29
Zombies	45

The story of the Nova Scotia startup group in 2018 is a story of broad-based growth, especially in such segments as ocean technology and life sciences. Nova Scotia accounted for almost half the new companies in the region. Nova Scotian companies raised \$67.1 million, which was overshadowed by New Brunswick's record year in funding. Nevertheless, it was the second-largest funding total for Nova Scotia in the eight years we have collected funding data. Nova Scotian startups added more than 570 jobs. The area of concern is that Nova Scotia accounts for two-thirds of the zombies in the region.

The highlights of the Nova Scotian startup community in 2018 are found in the life sciences and ocean technology sectors. In life sciences, several Nova Scotian startups are making noticeable advances. ABK Biomedical in early 2019 raised US\$30 million, the largest venture capital round ever in Atlantic Canada. Appli Therapeutics continues to grow and is planning a stock market listing. The list of companies that are selling their products is growing, with Bluelight Analytics, Adaptiv and Densitas increasing sales. And there is a concrete plan to increase the segment further. As we mentioned in Section 4.2, the BioFuture 2030 report sets out a plan to at least double the size of the segment by 2030.

The nascent ocean technology sector is seeing stronger growth in Nova Scotia than in any other part of the region. Some 32 of the 47 ocean-related startups we cover are based in Nova Scotia, and the ecosystem for the burgeoning sector is most advanced in the Halifax area. Halifax-Dartmouth boasts the Centre for Ocean Ventures and Entrepreneurship, or COVE, whose Startup Yard has grown into a meeting place for oceantech companies, and the Ocean Frontier Institute has a large presence at Dalhousie University.

The Cape Breton startup community had notable achievements in 2018. In October, Marcato Digital Solutions, the Sydney company that provided administrative soft-

ware for music festivals, was acquired by Pittsburgh-based Patron Technology for an undisclosed sum. As well as bringing some capital into the community, it freed up Marcato Co-Founder Darren Gallop to focus solely on his second company, Securicy. The cybersecurity company has been gaining traction, and was accepted into the Techstars Boston accelerator. It was one of three Cape Breton startups attending international accelerators in the past year – Orenda Software attended the FinTech Sandbox in Boston, and Talem Health in the first half of 2019 attended the Hartford InsurTech Hub.

The Cape Breton tech community abounds with energy and talent, and Momentum Cape Breton is one of the more inventive support organizations in the region, pioneering such initiatives as I-3, Sprint and Intersect. But the overall community shows some worrying metrics. There's weakness in funding and employment – likely an inter-related problem. We believe 38 of the 55 companies we follow in Cape Breton have no more than two employees. And the overall headcount for the community only grew by 9.7 percent, making it one of the weaker communities in the region for job growth. Cape Breton companies raised \$1.2 million in 2018, again making it one of the weaker centres in the region.

At the other end of the province, the fledgling incubator Ignite Labs in Yarmouth is nurturing some interesting startups. Opened in mid-2018, the entrepreneurship centre is working with some notable oceantech companies and developing a relationship with COVE in Dartmouth. The Lobster Trap Company is already manufacturing sustainable lobster traps. BlackWatch. Tech, which is developing a wearable safety device for fishermen, was one of the winners of \$25,000 in funding from Volta Cohort. ■

7.2 Halifax

Chart 7.2 - Halifax Fact Box 2018

Number of Companies	199
Funds Raised	\$64.3M
Number of Jobs	2,148
Job growth	29%
Revenue growth	63%
Elite Companies	19
Scaling companies	15
New companies	40

More than one-third of the Atlantic Canadian startups are based in Halifax, and the Nova Scotian capital is a critical mass of expertise, support organizations and ancillary companies. Like Atlantic Canada overall, Halifax lacks dominant champions on the national scene. But there is a remarkable variety of companies – some of them extremely promising – for a city of about 425,000 people.

One illustration of what's happening in Halifax is the variety of companies that have raised major VC rounds and/or received international attention in the past three years. The important thing is the range of sectors that they are from.

In Information Technology:

Manifold raised US\$15 million in venture capital in 2017, and was named to the 2018 Narwhal List, which is a group of Canadian companies closing big deals quickly. Affinio has raised more than \$15 million in its history and was named to the prestigious Microsoft for Startups program. Kinduct has raised more than \$12 million and some of the world's most famous sports teams are now using its technology.

In Life Sciences

TruLeaf Sustainable Agriculture raised \$8.5 million in 2017 and McCain Foods has now taken over management of the company. ABK Biomedical has announced two funding rounds worth almost \$50 million, though it is still pre-revenue.

In Manufacturing

Metamaterial Technologies has raised more than \$15 million since its inception, and has a major development deal with Airbus. It plans to list its shares on the CSE in 2019, raising at least \$10 million in the process.

In CleanTech

CarbonCure announced a funding round led by Breakthrough Energy Ventures, whose backers include Bill Gates, Michael Bloomberg, Jack Ma, Prince Alwaleed Bin Talal, Jeff Bezos and Richard Branson. The company is also one of 10 finalists in the \$20 million NRG COSIA Carbon XPRIZE challenge. ►

► The ecosystem in the city is also changing. Halifax Partnership has spearheaded the creation of the Innovation District – a patch of turf that stretches from Dalhousie University in Halifax’s South End to the Centre for Ocean Ventures and Entrepreneurship in Dartmouth. It includes the Innovacorp Enterprise Centre, which is a hub for life sciences companies, and Dalhousie University’s new IdeaHub, which offers space to companies producing hardware or other physical products.

At the heart of the Innovation District is Volta, which tripled its size in 2018 to 60,000 square feet, so it now encompasses the bottom three floors of the Maritime Centre. That means it can provide work space or offices for companies of varying size. As of May 2019, Volta listed 19 companies as residents. Volta has aggressively grown its innovation outpost community. Early in 2019, the organization signed an agreement with Accenture in which the global consultancy opened an outpost to help train clients in innovation. ■

7.3 New Brunswick

Chart 7.3 - New Brunswick Fact Box 2018

Number of Companies	144
Funds Raised	\$84.7 million
Number of Jobs	1,479.5
Job growth	21%
Revenue growth	154%
Elite Companies	8
Scaling companies	9
New companies	29
Failures	23
Zombies	11

There was a palpable change in the demeanor of the New Brunswick startup support personnel from February 2018 to January 2019. By the beginning of 2019, the province’s startup community had just completed its most successful year since 2011, when Radian6 and Q1 Labs announced they were exiting with a reported value of more than \$1 billion.

The last big event of the year in New Brunswick was the closing of Sonrai Security’s US\$18.5 million funding round, led by Boston-area VC firms Polaris Partners and TenEleven Ventures. Founded by Q1 Labs veterans Sandy Bird and Brendan Hannigan, Sonrai had been working away in Knowledge Park in Fredericton for about a year building technology that would protect enterprise clients’ data on the cloud, and make it easier for them to manage such assets. Its first public statement was its funding announcement, the largest pure venture capital round ever in Atlantic Canada.

NBIF was able to get in on the deal, and it was a golden deal for several reasons. It allowed the agency to invest alongside two large American funds – great for developing network. The company is involved in cybersecurity, which is a pillar of New Brunswick’s innovation strategy. Sonrai is headed by serial entrepreneurs, which increases the odds of success. The deal was the crowning achievement in a gathering wave of good news.

"This deal from an NBIF perspective is huge," said NBIF Director of Investment Raymond Fitzpatrick at the time. "It's the most experienced team that I have ever invested with ... and the fact that it's in cybersecurity, a strategic priority for this province, it really ticks all the boxes."

Earlier in the year, relationship software company Introhive had raised US\$15.2 million in equity and debt, and agtech company Resson had booked a \$14 million round, led by the world's leading tractor maker, Mahindra & Mahindra of India. The release of the CVCA data throughout the year had shown New Brunswick was on pace for a landmark year in fundraising. The Sonrai, Introhive and Resson deals accounted for \$65 million in funding. And other companies like Eigen Innovations, Chinova Bio - works, and Smart Skin Technologies came in with seven-figure funding rounds that added to the funding. In the end, Entrevestor calculated that New Brunswick companies raised \$84.7 million in funding - more than in the previous five years combined.

The celebrations over the eight-figure deals distracted attention from one of the recent success stories in the New Brunswick ecosystem - the sidecar funds operated by Opportunities New Brunswick. ONB announced the two funds in 2017, saying they would invest in any New Brunswick company that had received funding from an approved funder, like NBIF or East Valley Ventures. The program came about through a recognition that the province's startups were having difficulty raising capital, and the side car fund could ensure more capital for companies that had already passed muster with an accredited funding body.

The buoyant spirits were lifted further by a pair of exits in the autumn, both by

NBIF portfolio companies. Saint John-based EhEye, which developed video recognition software for public security, was purchased by Patriot One Technologies of Toronto for more than \$3.2 million in stock in November. The companies announced Patriot One would integrate the New Brunswick company's software with its Patscan weapon-detection system while maintaining the Saint John operation. Meanwhile, Fredericton-based Envenio, whose technology assists in the understanding of fluid dynamics, quietly exited, being taken over by San Francisco electronic cigarette company Juul. The buyer, which has 800 employees and US\$1.1 billion of annual revenue, planned to maintain and grow the Fredericton R&D team.

And underpinning all the good news was simply a solid performance by companies based in New Brunswick, especially in the Fredericton area. The companies that shared revenue data with us reported that sales increased more than 150 percent in the year, and employment at New Brunswick startups increased about 21 percent.

The festive spirits around the holiday season marked a huge improvement from the early months of 2018. The previous year had been a weak one for funding by New Brunswick startups - they raised only \$9.9 million in equity funding in 2017, barely half the level of Newfoundland and Labrador. Then early in 2018, Fredericton-based Knowcharge, a company that made static-free paper for packaging electronics, filed a lawsuit against NBIF, First Angel Network, and some of their current and former officers. In May, NBIF announced that CEO Calvin Milbury (who had been named in the case) was no longer with the organization. By September, a judge had stayed the case and NBIF and FAN both say there is no legal action against it now. ■

7.4 Newfoundland and Labrador

Chart 7.4 - Newfoundland and Labrador
Fact Box 2018

Number of Companies	69
Funds Raised	\$8.8 million
Number of Jobs	1,005
Job growth	18%
Revenue growth	178%
Elite Companies	9
Scaling companies	4
New companies	24
Failures	7
Zombies	3

In the spring of 2019, Pelorus Venture Capital Director Chris Moyer granted an interview to Entrevestor to discuss the performance of the first Venture NL fund and the possibility of raising a second. “We have not started actively fundraising for Fund 2 but we would like to continue investing in Newfoundland and Labrador because we think it is a strong ecosystem,” said Moyer. “We think it is the strongest [ecosystem] in Atlantic Canada.”

The ability of the Newfoundland and Labrador startup ecosystem to produce elite companies quickly is indeed impressive, and has improved in the past two years. It’s produced a community in or near St. John’s (all the NL companies we track are based on the Avalon Peninsula) that features several top-tier and scaling companies, without a broad flank of marginal companies draining resources. The province in 2018 launched 24 new companies, more than ever before. It means that St. John’s has the youngest startup community in the region – 55 percent of the NL companies we’re following are one or two years old. It will likely mean more failures going forward as most of these new companies have yet to go through the rigours of the marketplace, but it will no doubt produce some successful ventures as well. ■

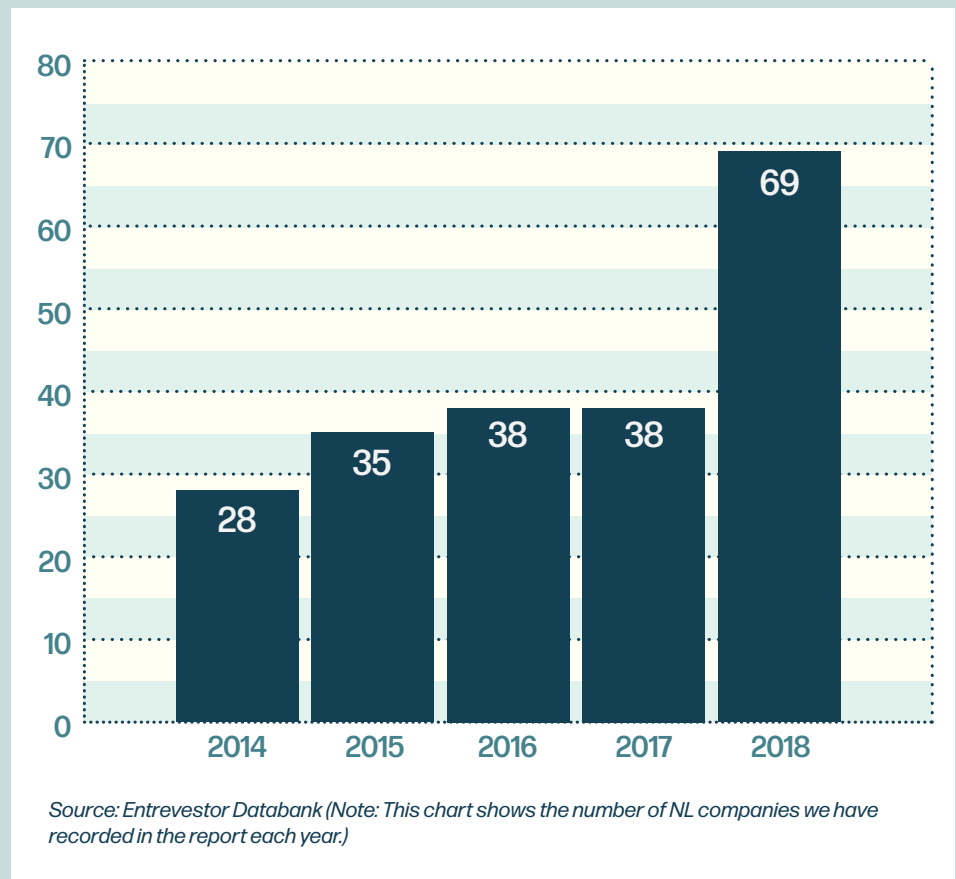
Chart 7.5 - Number of NL Startups by Year

There are three reasons for this spike in company launches. The first is that Genesis has upped its game in the last few years. The dean of the region's startup support organizations has shed its responsibilities for negotiating IP for Memorial University, and moved from the university's main campus to the Emera Innovation Exchange on the side of Signal Hill. In 2019, it has also taken over the Common Ground co-working space in central St. John's and launched a \$775,000 micro-investment fund. These moves have tripled the organization's capacity, and made it a member of the broader community rather than part of MUN. The overall effect has been a wider outreach to more entrepreneurs. Genesis' Evolution program for pre-seed companies has now been going for several years and is helping young companies find product-market fit.

The second factor in generating young companies is the growth of the Memorial Centre for Entrepreneurship. This group has done a great job of helping students at the university develop ideas for companies and provide early-stage mentorship. It provides initial funding through the Woodward Cup competition, which in early 2019 handed out \$35,000 in prize money to five companies.

MCE is also involved in the third factor in company formation in St. John's - the Bounce Health Initiative. Bounce is a collaborative effort between MCE, Eastern Health, the MUN Faculty of Medicine and the Newfoundland and Labrador Association of Technical Industries, or NATI. The Bounce process starts with participants asking Eastern Health what problems the province's biggest health authority is facing. Once they've identified a problem, they bring together innovators to try to find a solution.

Take for instance BreatheSuite, a company that aims to improve the use of inhalers. CEO Brett Vokey started the company during a work term for his



engineering degree. Going through the Bounce process, he learned that too many people don't use inhalers properly, rendering them all but useless. The structure of Bounce allowed the engineer to understand this medical problem and work toward a marketable solution.

This improved ecosystem for launching companies is underpinning a community that is producing some remarkable ventures. We've classified nine NL startups as elite companies, and four as scaling. That means 12 percent of the startups in the province are in our top tiers for growth-stage companies. They include HeyOrca, which said publicly in late 2017 that its annual recurring revenue rose 170 percent to \$1 million in the first 10 months of that year. CoLab Software is the first Atlantic company named to the prestigious Y Combinator accelerator in Silicon Valley. We were tempted to name CoLab and a couple of other young companies to our "elite" list but think they need another year or two of revenue growth.

The funding for Newfoundland and Labrador came in at \$8.8 million in 2018. That was less than half the \$18.4 million reported in 2017, but is nonetheless a good level. Stripping out the Verafin private equity funding in 2014, the province had never produced more than \$4 million in equity funding in any year before 2017.

One final note: Newfoundland and Labrador has the smallest base of zombie companies in the region. According to Entrevestor's analysis, only three companies (4 percent of all NL startups) are considered zombies, compared with a proportion for all Atlantic Canada of 12 percent. ■

7.5 Prince Edward Island

Chart 7.6 - P.E.I. Fact Box 2018

The ecosystem continued to evolve on Prince Edward Island in 2018, as Island Capital Partners became more of a force, and the life sciences organizations expanded their reach.

Island Capital Partners has very quickly established itself, not just as a funding group but also as a focal point and source of mentorship. When the group announced its creation in 2017, what impressed people immediately was the track record of the founders. Its five executives and/or investment managers had long careers in business development, finance and accounting. Beginning late in 2017, it built up a portfolio of six companies – Onset Communication, Stash Energy, Garago, Bluefield Seeding Solutions, Forestry.io, and Island Water Technologies. At least one-third of this portfolio has achieved follow-on funding since receiving its first investment from ICP, and Island Water attended the H2O accelerator in California.

Several of the Island’s leading high-growth companies announced major initiatives or events during or soon after 2018. Nautilus Biosciences Canada, a marine biotechnology company, was purchased in June by the British specialty chemical-maker Croda International Plc for an undisclosed price. Charlottetown-based Somru BioScience received loans and grants totaling more than \$4.4 million from the federal and P.E.I. governments, and said it was raising further equity capital. In March 2019, drug-manufacturer BioVectra Inc. announced a five-year, \$144.6 million expansion project in its facilities on P.E.I. and in Windsor, N.S. In early 2019, Stepscan Technologies, which has developed pressure-sensitive floor mats, launched a mobility assess-

Number of Companies	47
Funds Raised in 2018	\$6 million
Number of Jobs	263
Job growth	22%
Revenue growth in 2018	22%
Elite Companies	2
Scaling companies	3
New companies	8
Failures	6
Zombies	8

ment tool for hospitals and a new product that helps the military train soldiers in combat techniques.

Meanwhile, the group of organizations led by the PEI BioAlliance continues to gain momentum. The PEI BioAlliance has been going for most of this century and its companies now bring in more than \$215 million in annual revenue. The cluster – which includes government, institutions and private companies, conducts more than \$70 million in R&D annually. Its Emergence incubator has mentored a core of companies from Atlantic Canada over the past five years, as well as other Canadian and international companies. Though its Executive Director Martin Yuill departed for a position in Ontario early in 2019,

there are plans afoot to expand its work in the future. Meanwhile, Natural Products Canada increased its investment activities in 2018. Its portfolio includes such Atlantic Canadian companies as Island Water Technologies of Charlottetown and Chinova Bioworks of Fredericton.

The Startup Zone has grown in prominence in the local ecosystem. Patrick Farrar, who previously held a senior position with Ventures for Canada, became the CEO in the summer, and was a Co-Chair of Invest Atlantic when the conference was held in Charlottetown in September. Under his leadership, Startup Zone has adopted a stable of specialist mentors to work with young companies to get their products into the market. ■

Section 8 - The Atlantic Canadian Ecosystem

The Atlantic Canadian startup ecosystem continued to evolve in 2018. As of writing this report in the spring of 2019, we see four areas in which the evolution is continuing.

More Provincial Cooperation

Provincial cooperation is increasing dramatically in the startup space, largely because of the Atlantic Growth Strategy, a collaborative initiative between the federal government and the four provinces. The Growth Strategy has formed sector-specific groups that have gathered data across the region and plotted a common strategy. The sector group that has produced the most visible progress is life sciences, with BioNB, BioNova, PEI BioAlliance and the Newfoundland and Labrador Association of Technical Industries coming together to form the Atlantic Canada Bio-Industries Alliance. The work is progressing with several startup houses in major centres working together to deliver a collaborative strategy and help each other's members.

Oceans Support

The growth of ocean technology companies outlined in Section 4.5 has been mirrored by the expansion of the ecosystem for ocean technology. The Creative Destruction Lab-Atlantic has begun to offer mentorship for oceantech companies within its general program, and has attracted participants from as far away as Ireland and Denmark. CDL-Atlantic in the spring of 2019 was expected to announce a separate stream for oceantech companies, which would no doubt provide not only programing but also funding for nautical innovators. Innovacorp in 2018 launched its Blue Solutions competition, which provided funding to ocean companies. Innovacorp also oversees the Start-Up Yard at the Centre for Ocean Ventures and Entrepreneurship, which has become the principal hub for ocean technology in the Halifax area. It offers programs, modest funding and working space - and access to a testing area in Halifax Harbour (a rarity for oceantech hubs).

In the spring of 2019, the CBC reported that the Ocean Supercluster has signed its agreement with the federal government and hoped to be proceeding with research projects within months. There was no indication yet of how the group would support startups, though it had named Melissa O'Rourke as its Innovation Ecosystem Program Manager. She had previously been Accelerator Program Manager with the University of New Brunswick's Technology Management & Entrepreneurship program.

Expansion into Rural Areas

Innovators tend to cluster in urban areas, but there has been a drive to establish bases in more sparsely populated places. For years, the drive to encourage businesses in rural areas was led by Mashup Lab, which operates virtual accelerators for rural entrepreneurs. Now that Propel has launched its virtual Incite programs, there are a range of idea-stage and growth-stage programs available to entrepreneurs regardless of their location. This network of virtual programs is complemented with more physical spaces outside of major centres. The Hub South Shore co-working space has been operating for years, providing a base for entrepreneurs and freelancers in Nova Scotia's Lunenburg County. In 2018, Ignite Labs opened in Yarmouth, offering programing and work space with a special emphasis on ocean technology. Now that it has grown rapidly in St. John's, Genesis is planning to expand more to the West Coast of Newfoundland, where the current entrepreneurship hub is the Navigate Entrepreneurship Centre at Memorial University's Grenfell Campus.

Supporting Sales

The greatest change in the ecosystem for startups in the last two years is the structured education of sales. It is a development that extends beyond the startup community and into the business community at large. There is a growing understanding and acceptance that sales are the cornerstone of all organizations. In order for the Atlantic Canadian economy ►►

► to grow, we have to move beyond the misconception that sales people are shallow and shifty and embrace professional sales executives as people who solve their clients' problems and provide employers with essential revenue.

The growth of sales curriculum in Atlantic Canada came out of an interesting paradox. The region had great success in producing early stage companies, and support organizations realized these companies needed help in scaling. As former NBIF Chief Executive Calvin Milbury used to say, the economic benefit of a startup community doesn't come from startups but scale-ups. That is, the economic growth happens when we have a fleet of ventures that have millions of dollars in revenue and scores of employees.

Governments responded to the growth in scale-ups in two ways. What they did NOT do was support scaling companies by providing Series A funding. If larger companies need equity funding, as a rule they have to find it from private sources, usually outside the region. That's the proper approach as funding rounds over \$2 million entail a level of risk that exceeds the comfort level of governments and taxpayers. Second, support organizations established programs that taught, encouraged – pretty well forced – companies to sell. All of a sudden, there are a lot of these programs:

Scale Up Atlantic Canada – The Technology, Management and Entrepreneurship program at University of New Brunswick teamed up with the “Scalerator” program at Babson College in Boston. Babson, perennially ranked as the leading college in the U.S. for entrepreneurship, developed a sales process designed to take companies with revenues in the \$4 million to \$15 million band and increase their sales. Past experience shows that 75 percent of Scalerator participants experience significant growth within months.

The MBA program at UNBSJ – The University of New Brunswick Saint John in 2018 began offering a 12-month MBA course with a stream in “Business Development and Professional Sales”, making it the first English-language university in Canada with a sales program. “We're very proud and very excited to develop a program that is very highly needed in the market, both in Canada and globally,” said Shelley Rinehart, the MBA Director at UNB Saint John. “Anything that is important to the business world will eventually find its way into the business schools because that's what business schools do.”

Scale-Up Hub: Cambridge – In 2018, Nova Scotia Business Inc. realized that scaling companies need to be close to their customers for prolonged periods. So it devised the 12-month Scale-up Hub: Cambridge program, in which Atlantic Canadian companies spend at least one week a month in Massachusetts. The first three companies that went through the program increased revenues by a total of \$2 million in the first year. In Year 2, it was expanded to six companies from across the region.

Ignite Fredericton's Export Program and Sales Accelerator Program – The Fredericton entrepreneurship hub is now holding two programs to encourage sales. The Sales Accelerator Program helps companies find new markets and increase revenues through sales training from industry experts. It also offers participants access to as much as \$25,000 to support market entry and business development activities. The Export Igniter is a 12-week program to help companies sell effectively in foreign markets. Organized by Ignite Fredericton and Planet Hatch, the program delivers comprehensive programming, mentorship and resources to companies ready to enter markets outside Canada.

Saint John tech investor Gerry Pond has been arguing for years that more needed to be done to teach sales, saying this gap was a big problem in Canada and an acute problem in Atlantic Canada. Two other Saint Johners are now helping to develop sales professionals in the region. Joanna Killen and Corey Dugas launched Momentum in early 2017 to help companies increase sales. What's admirable about their business is they don't just tell their clients how to sell. They sit down with them and together they call customers – often hundreds of them – to build up a proper sales funnel. Over the longer term, Momentum holds founders accountable, making sure they are in regular contact with their customers. One interesting thing Killen and Dugas say is that the transformational event for the growth of their own business was linking up with investors. Some investors have become so impressed with Momentum that they tell startups they will back their businesses only if the founders use some of the money to hire Momentum and increase sales.

Atlantic Canada Opportunities Agency

ACOA's main role in the ecosystem is to serve as the central bank for all other program providers. Most – if not all – of the organizations listed below rely on ACOA for funding and guidance. It's difficult to overstate the importance of ACOA's role in most components of the Atlantic Canadian startup ecosystem. The Atlantic Canadian community has a reputation across the country for its non-dilutive financing, which is seen as an advantage (it helps companies grow) and a detriment (it becomes a crutch). But it's not hyperbole to say that the startup community would not exist in its current form without ACOA's support. It underpins many of the programs and organizations described in this section. Under the leadership of Francis McGuire, ACOA is working to take a more regional perspective in several key sectors. It has named “champions” for such priority areas as IT and Oceans to produce a broader view of these segments.

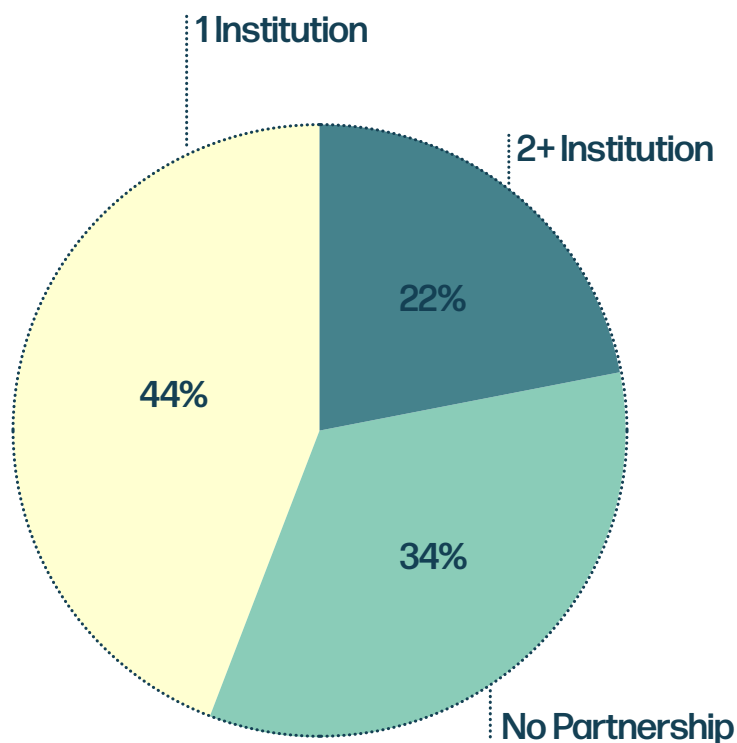
There are two ACOA programs that come up regularly in conversations about startups – the Business Development Program, which provides loans of up to \$500,000 to startups that have raised equity capital; and the Atlantic Innovation Fund, which extends loans of up to \$3 million for R&D. ■

8.1 Educational Institutions

One finding of our startup survey that surprises us year after year is how consistently startups that work with post-secondary institutions outperform the overall community. As you'll see in the following paragraphs, we found more evidence of this phenomenon in 2018. These partnerships may take the form of IP developed at an institution, conducting ongoing research with a college or university, using work space, prototyping or attending an entrepreneurship program. Whatever the connection, our research shows that startups that work with universities and colleges provide the best metrics.

When we conducted our most recent survey, we asked respondents whether they had worked with post-secondary institutions in any way in 2018. This was an imperfect exercise because the reach of universities in the Atlantic Canadian economy is so pervasive that many startups are benefiting from their programming without realizing it. For example, Genesis (established by Memorial University) is such a powerful organization within the St. John's startup community that it's likely that 80 or 90 percent of that city's startups could say they have a relationship with MUN. (As it turned out, two-thirds of our respondents from Newfoundland and Labrador said they had been working with MUN.) In any case, the results show how essential universities and colleges are to the ecosystem. ■

Chart 8.1 - Working with Post Secondary Institutions, 2018



About two-thirds of the 157 respondents said they had worked with at least one university or college in 2018. Of these 103 companies, some 34 are working with more than one institution. Some of the respondents listed three or four institutions they were working with. Fourteen companies said they were working with institutions in more than one province.

One thing to consider when discussing startups' relationships with educational institutions is research budgets. It stands to reason that the schools with the larger research budgets should have greater capacity to launch or aid young companies. The following are the research budgets in 2018 at Atlantic Canadian universities. ■

Source: *Entrevestor Databank*

Chart 8.2 -
**Atlantic Canada's
Top Research
Universities 2018**

Dalhousie University was the most-frequently cited institution as a partner, named by 45 startups. Twenty of these companies were working only with Dal. Here is a list of the Top 10 mentions in the survey:

Institution	Sponsored Research Income	%age Change	National Ranking
Dalhousie	\$150.0M	10.4%	15
Memorial	\$111.8M	22.8%	20
UNB	\$48.2M	26.4%	26
UPEI	\$12.9M	-2.0%	41
U de M	\$12.0M	-0.9%	42
St. Mary's	\$8.3M	12.8%	47
St. F X	\$7.7M	-8.0%	48
CBU	\$6.7M	20.8%	50

Source: ReSearch Infosource Inc.

Chart 8.3 - **Institutions Cited in the Entrevestor Survey**

Institution	Times Mentioned
Dalhousie	45
UNB	21
SMU	19
NSCC	14
Memorial	12
NBCC	10
Acadia	9
St FX	6
UPEI	6
CBU	4

Source: Entrevestor Databank

One thing to note about Chart 8.3 is that it does not show the number of actual partnerships between startups and institutions. It simply reveals the number of times each institution was identified in our survey as being a partner. There's little surprising about Dalhousie's prominence in the list - it's the largest research institution in the region, and is the biggest educational institution in the region's biggest city.

But there are a few surprising findings in this exercise. First, colleges play a much larger role in the startup ecosystem than many of us realize. Fourteen startups are working with the Nova Scotia Community College and 10 with its counterpart in New Brunswick. One company also listed Holland College as a partner. That means colleges were cited 23 times in our survey as partners with startups - 15 percent of the references to academic institutions.

Chart 8.4 - Performance of Startups Working with Post-Secondary Institutions

Number of Companies	103
Employees	815
Job Growth	45%
Total Revenues	\$20.2 million
Revenue Growth	130%
Funds Raised	\$77.2 milion
Planned Fundraising	\$56.8 million

Let us stress that this is not a complete list of Atlantic Canadian startups working with educational institutions – it’s only the companies that responded to our survey. But it’s a strong enough cross-section to show the out-performance of this group. At a time when Atlantic Canadian startups are growing their staff by 22 percent, the companies working with colleges and universities are increasing headcount by 45 percent. With revenue, the ratio is 75 percent to 130 percent. These findings are also consistent with our observations in past years. In 2017, the companies working with post-secondary institutions doubled revenues while the total community reported 74 percent growth. ■

Second, University of New Brunswick’s impact on the startup system is astonishing given its research budget. The Fredericton-based institution is a distant third, spending one-third of what Dalhousie spends on R&D. Yet it’s mentioned by 21 startups as a partner and its Technology Management and Entrepreneurship program is shaping startup programing in several areas, such as sales, cybersecurity, and renewable energy. In terms of applied research resulting in new companies, UNB has produced some of the most prolific researchers in the region, including Rickey Dubay, Ali Ghorbani and Felipe Chibante. When we examined the respondents that worked with post-secondary institutions, we found that they out-performed the rest of the community in all the major metrics. ■

Springboard Atlantic

Springboard Atlantic is a non-profit organization that develops links between Atlantic Canadian academia and industry, and works to develop companies based on research conducted in the region. The pan-regional group works with 19 colleges and universities and has a network of executives to serve as a bridge between industry and academia. The group supports startups by providing funding and mentorship to young companies and helping them to understand problems faced by industry.

In the near future, Springboard Atlantic will hold a series of round-tables in select industries to deepen the relationship between the private sector and researchers. The goal is to gain a more thorough understanding of industry problems, and this could lead to new companies to solve the issues. ■

University Entrepreneurship Programs

Here is a glance at the entrepreneurship programs operated at universities in the region:

Acadia University

Acadia Entrepreneurship Centre
www.acadiaentrepreneurshipcentre.com
Findlay MacRae

The AEC predates the startup boom. The centre's tagline is "Supporting the Rural Economy," and its Rural Innovation Centre offers incubation services to young businesses. Within the startup efforts in the region, it takes a unique focus, striving to apply cutting edge technology to agricultural and rural initiatives. It works closely with the Acadia Institute for Big Data, which has launched several projects involving the wine and agricultural industries, and Launchbox, the Acadian University sandbox. The Centre has bases in Wolfville, Liverpool and Bridgewater.

Memorial University of Newfoundland

Memorial Centre for Entrepreneurship
mce.mun.ca

Florian Villaumé

The MCE is dedicated to helping MUN students and faculty learn about entrepreneurship and get their businesses off the ground. The group has become more visible in the past few years, as students and recent grads have launched high-profile startups. Project SucSeed and CoLab Software are two companies that have won the MCE's Woodward Cup, which provides seed funding for young companies. MCE is also a key component of the Bounce Healthcare initiative, which is helping to generate medical tech companies in the province.

St. Mary's University

Masters of Technology, Entrepreneurship and Innovation
smu.ca/academics/sobey/master-technology-entrepreneurship-innovation
Ellen Farrell

Launched in 2013, the program is an accelerated graduate program aimed specifically at people who want to develop their own company or lead innovative divisions of existing corporations. The MTEI takes only 16 months to complete and focuses on lean methodology. In the spring of 2018, the program changed the way it funded startups, moving from a pitching competition to a VC-

based model, in which funding relies on students reaching milestones. Reaching the first milestone can produce funding of up to \$25,000. SMU is also home to the David Sobey Centre for Innovation in Retail and Services and has opened the SMU Entrepreneurship Centre.

For the past two years, SMU has also offered a pioneering program to teach students about venture capital. Venture Grade is a VC fund managed entirely by students. SMU teams have won second place two years in a row in the New England edition of the Venture Capital Investment Competition, the world's largest venture capital competition.

Dalhousie University

LaunchDal - www.launchdal.ca

The IdeaHUB - www.Dal.ca

Jeff Larsen, Mary Kilfoil, and Margaret Palmer

Dalhousie University holds a special position in this group because it accounts for 42 percent of the research spending by Atlantic Canadian universities. That amounted to \$150 million in 2018, according to Canada's Top 50 Research Universities. As the region's dominant research university, its R&D has produced several scaling and elite companies, especially in the life sciences sector. Recently, the university has become the East Coast base for the national Creative Destruction Lab initiative, which has helped to increase angel funding in the region. (See Section 3.4.)

A few years ago, Dal was best-known in the entrepreneurship community for the LaunchDal program, a pioneering project launched in 2012 by professors Mary Kilfoil and Ed Leach. This group also oversees LaunchPad, a summer program that awards \$100,000 to 10 startups. In the past three years, the program offering has broadened.

Dalhousie in 2018 opened the ideaHUB in a new facility in the Sexton Campus, and accepted its first seven companies as residents. The ideaHUB provides working space and mentorship for companies that aim to produce and sell physical products, not just software. The facility aims to link its resident

companies with experts at the Faculty of Engineering and provide access to workshops and 3D printers.

Dal is a central partner in the Ocean Frontier Institute, which received \$220 million in funding in 2016. An international hub for ocean research, OFI brings together experts from both sides of the North Atlantic to explore the vast potential of the ocean.

University of New Brunswick

Technology, Management
and Entrepreneurship

unb.ca/gradstudies/programs/tme.html

Dhirendra Shukla

Housed within the Faculty of Engineering, the Dr. J. Herbert Smith Centre for Technology, Management and Entrepreneurship emphasizes the role of engineering and design within the development of a product. The university's research has been vital to many of the leading companies in the Fredericton area, one of the hubs of entrepreneurship in the region. The program now includes a Masters of Technology, Management and Entrepreneurship. The TME program operates two accelerator programs: Energia Ventures, which offers programming for energy, cleantech and cybersecurity companies, and the Summer Institute, which teaches the human elements of entrepreneurship.

TME continues to grow and in 2018 it launched Scale Up Atlantic Canada in collaboration with Boston-based Babson College – long recognized for its entrepreneurial program. The accelerator will be led by Babson professor Daniel Isenberg, who will use his trademarked program Scalerator as the basic curriculum. The first cohort of companies, with target revenues of \$5 million or more, went through the program in the winter of 2018-2019.

UNB is the home of the Canadian Institute for Cybersecurity, which provides research into one of the pillars of Fredericton's IT community. The university is also a founding member of the Smart Grid Initiative, which is a partnership between government, private industry and academia to improve the storage and transmission of electricity. ■

The Nova Scotia Sandboxes

Nova Scotia also has a "sandbox" program, which is a series of groups within universities that aim to spark interest in entrepreneurship. These programs serve as tentacles into the community, educating researchers and students about programs and drawing them into entrepreneurship.

The Island Sandbox - islandsandbox.ca

Cape Breton University, NSCC

D. Darren MacDonald, Manager

The Island Sandbox is a collaboration between Cape Breton University and the Nova Scotia Community College. Its primary focus is to help students launch businesses in three key areas – cleantech, social entrepreneurship and entrepreneurship for New Canadians.

Shiftkey Labs - shiftkeylabs.ca

Dalhousie, NSCAD, SMU, Volta, NSCC

Grant Wells, Manager

Shiftkey's specialty is software-based innovations. The organizers believe it can be challenging to navigate the wealth of resources and supports available to bring ideas to fruition. ShiftKey Labs aims to lead the entrepreneur through the development process. It lets entrepreneurs work out of the free collaboration space where they can meet with current students, post-secondary alumni, mentors, and industry partners.

Cultiv8

www.cultiv8ag.com

Dalhousie's Agricultural School, Acadia

Located on the campus of the former Agricultural College, Cultiv8 aims to bring about innovation in agriculture. The services range from testing ideas to teaching business principles, and the group hosts a range of events.

The Spark Zone - thesparkzone.ca

SMU, NSCC, NSCAD, MSVU, Atlantic School of Theology

The Spark Zone brings together students and community members to create, develop and ultimately launch business ideas and social innovations. The Spark Zone gives students access to a variety

of services and supports at each partner institution, striving to provide opportunities for both students and community members interested in developing an entrepreneurial mindset. The group has been working with the David Sobey Centre for Innovation in Retail and Services to generate retail-related startups.

Launchbox - aec-wordpress.colibri-software.com/launchbox

Acadia University

Launchbox is the centre for student entrepreneurs at Acadia University. It supports students in their entrepreneurial pursuits by providing free programming, networking, access to mentors, and other entrepreneurs, working space and competitions.

IDEA - www.ideaproductdesign.org

Dalhousie, NSCAD - **Clifton Johnston, Associate Professor**

IDEA is a multidisciplinary collaborative initiative that integrates NSCAD Design with Dalhousie's Faculty of Engineering and the Rowe School of Management. The IDEA Sandbox is built around new product development. Currently located in the Waterfront Design Studio, IDEA provides professional mentoring, seminars, programming and space for students, faculty and businesses in support of product development.

Innovation and Enterprise Centre

www.innovatenortheast.ca

St. Francis Xavier University

Paula Brophy, Coordinator

The StFX Extension Innovation and Enterprise Centre believes that rural communities have the assets and strengths to face current economic, environmental, social, and cultural challenges. Programs and services available at the centre focus on actively tapping into existing assets in order to develop new enterprise opportunities.

Surge Innovation - Surgeinnovation.ca

Dalhousie University

Jordan Gardiner and Aaron Newman

Surge aims to train science students to think like entrepreneurs and turn their research into businesses. It offers a range of programs that encourage researchers to use their scientific knowledge to solve problems. ■

8.2 Mentoring Groups

There's a fine line between the startup houses and the mentoring groups, as many organizations offer both work space and programming. The groups in this section are primarily mentoring bodies, while those in Section 8.4 feature places where entrepreneurs can work.

Propel

Pan-regional - Propelict.com

Barry Bisson

The regional IT accelerator completed its third major revamp in 2018 by launching a virtual accelerator comprising two phases. It initiated Launch36 in 2011, then the pan-regional PropelICT accelerator in 2014. In 2018, the Propel board hired a new CEO, Barry Bisson, the former head of UNB TME and Shad, a national program for gifted high school students. He oversaw the creation of Incite, a program that overcomes the vast distances between cities in the region by offering all curricula online. The first phase helps participating companies find their product-market fit and the second teaches sales methodology.

As of the spring of 2019, Propel has completed Phase 1 and is mid-way through Phase 2 of its first cohort. Eleven companies presented at the first Incite Demo Day in May 2019 in Saint John.

The Joint Economic Development Initiative, or JEDI

Fredericton - www.jedinb.ca

Alex Dedam, President

JEDI is a not-for-profit that supports Aboriginal participation in the New Brunswick economy, working closely with the federal and New Brunswick governments. The four tribal councils of New Brunswick and the New Brunswick Business Council govern JEDI. JEDI launched the country's first tech accelerator for Aboriginal entrepreneurs in 2016 and is now more focused on a broad range of entrepreneurial support.

Spark and Ignite (Affiliated with Mashup Lab)

Rural Nova Scotia - www.mashuplab.ca

Andrew Button

Mashup Lab offers online curricula to help entrepreneurs in rural areas. Andrew Button, CEO and Founder of Mashup Lab, began Spark in September 2015 to assist entrepreneurs who don't have easy physical access to programs and mentors. Ignite is for people who have validated their ideas and are in the early stages of launching and looking for their first clients. Both programs feature two three-hour online seminars per week for six weeks.

B4 Change

The Pond Deshpande Centre Fredericton

www.ponddeshpande.ca/social-enterprise-accelerator

Karina LeBlanc

The accelerator at UNB's Pond-Deshpande Centre focuses on social entrepreneurship, or companies with a social mission. The accelerator is now five years old with dozens of graduates.

Innovacorp's Programs

Nova Scotia - Innovacorp.ca

Nova Scotia's public early-stage venture capital agency launched programs for startups in general and in specific sectors in the past few years. The organization offers its Sprint combination, which is open to all innovation companies across the province. Other programs continue to evolve, though in recent years they have included sector-specific competitions for such segments as oceantech, cleantech, and life sciences.

Innovacorp also oversees the Start-Up Yard at COVE in Dartmouth, which has become the hub for oceantech in Halifax. As well as working space, it offers some funding and mentorship to resident companies.

The Cape Breton office of Innovacorp has proven to be one of the more creative teams in the ecosystem. Over the years it has initiated the I-3 and Sprint competitions, which Innovacorp adopted across the province. More recently, it has launched the Intersect program, in which established businesses like laundry services or manufacturers reach out to entrepreneurs to help them solve problems.

The NextPhase

Pan-Regional - thenextphase.ca

Toon Nagtegaal

The NextPhase is a four-day workshop that uses proprietary software to force entrepreneurs to assess their clients' pain and plot how to make money by solving it. The workshops have been held for several years and are now led by Toon Nagtegaal, a former VC executive from the Netherlands, and David Crow, former Evangelist-in-Residence at OMERS Ventures. The sessions are known for their blunt assessment of the candidates' business prospects and for providing a roadmap for each company to reach the market. This is the only program that accommodates companies in all sectors and all four provinces. The program has graduated more than 200 companies, including Entrevestor. ■

8.3 Investor Groups

In March 2019, the oldest startup funding body in the region closed its doors. First Angel Network founders Ross Finlay and Brian Lowe decided to end the organization that had backed scores of companies over 14 years. The ecosystem for financing innovation has evolved since FAN started and now includes the following nine groups:

Build Ventures

Backed by five governments and private limited partners, Build Ventures holds a unique position in the East Coast funding community. It is the only fund set up to invest tranches of \$1.5 million to \$3 million. As of the spring of 2019, Build was raising its second fund and had secured commitments from the governments of Nova Scotia and New Brunswick and the federal government's Venture Capital Catalyst Initiative, or VCCI.

Concrete Ventures

Concrete Ventures, which has more than \$17 million to invest, offers investments from \$100,000 to \$750,000 to pre-seed companies in Atlantic Canada. The fund is helmed by Patrick Hankinson, an entrepreneur and investor whose company Compilr exited for more than \$20 million in 2014. Concrete launched in 2018 after receiving a commitment of \$15 million from the Nova Scotia government. It has made several investments as of spring 2019, joining rounds by Halifax SaaS companies Proof and SalesRight.

Creative Destruction Lab - Atlantic

In less than two years, the Creative Destruction Lab-Atlantic has established itself as the main angel funding group in Atlantic Canada, with its members investing about \$7 million into 23 companies. The CDL is primarily a mentorship group that assembles wealthy business people (who it calls fellows or associate fellows) to advise and invest in young innovation companies. Its biggest impact may be in corralling angel investors (both in Atlantic Canada and elsewhere) and getting them to write cheques for Atlantic Canadian entrepreneurs. As we wrote in Section 3.4, it is a big reason that angel investing is so strong in the region.

East Valley Ventures

Headed by Gerry Pond, East Valley Ventures is a division of diversified technology company Mariner Partners. It conducts business similar to an angel network, bringing local investors into funding deals, and its members have backed two of the most successful investments in the history of the East Coast startup community - Radian 6 and Q1 Labs. Its members stress that they place far greater emphasis on mentorship than on funding. As of June 2019, East Valley's portfolio comprised 29 companies, most based in New Brunswick. The group recently lost its CFO Jeff White, who became the CEO of the New Brunswick Innovation Foundation. Pond says the future of the group rests with younger members of the management team, including: Bob Neal, the former Vice-President of Business Development at Aliant Telecom and a 25-year veteran of the ICT sector; and Head of Business Development Rick MacPhee, who has 24 years experience in ICT.

Innovacorp

As a venture capital fund, Innovacorp received a funding injection of \$40 million for its Nova Scotia First Fund in 2017, and has become more ambitious since. Its CEO Malcolm Fraser, hired in 2017, has set the goal of Atlantic Canada having one of the top 10 startup ecosystems in the world. To establish a baseline, Innovacorp enlisted Atlantic Canada in Startup Genome, an international organization that assesses the performance of startup communities around the world. It said Atlantic Canada was the No. 4 ecosystem in the world in the "Activator" category. In 2018, Andrew Ray was promoted to head the investment team, and immediately said Innovacorp's Nova Scotia First Fund should be run like any other VC fund and aim to produce a return for its limited partner, the Nova Scotia government. Lately, Innovacorp's staff and board have been speaking more about finding a billion-dollar investment opportunity.

Island Capital Partners

ICP launched in 2017 with the announcement that it was beginning with \$4 million to invest. What impressed observers was not so much the size of the fund but the mentorship potential it brought to its portfolio companies. The fund is headed by managing investment director Alex MacBeath, a former CEO of Grant Thornton Canada. Its partners include: Ron Keefe, the former CEO of Charlottetown drug manufacturer BioVectra; Steve Nicolle, former CEO of Halifax-based STI Technologies; and Paul Lypaczewski, who has run several IT companies over the past 30 years. Its Director of Operations is seasoned financial executive Stefanie Corbett. Within a year and a half, it built up a portfolio of six companies: Forestry.io, Garago, Stash Energy, Island Water Technologies, Onset Communication and Bluefield Seeding Solutions Inc.

Killick Capital

Managing the holdings of the Dobbin family of St. John's, Killick Capital is now rechanneling the proceeds of two exits into an exciting assembly of young ventures. The investment company sold part of its Killick Aerospace business for about US\$229 million in January 2015, months after it exited its investment in anti-fraud software maker Verafin in a private equity buy-in. Since then, President Mark Dobbin has been methodically investing in a portfolio of younger companies, such as HeyOrca, Sequence Bio and Empowered Homes. The portfolio has focused on Killick's home province of Newfoundland and Labrador, though in 2018 the fund invested in Halifax-based Harbr. Celtx, which it invested in early in the decade, continues to grow. ►

► New Brunswick Innovation Foundation

The NBIF portfolio looks better today than it did early in 2018 as so many of its companies achieved follow-on funding. (See Section 7.3.) The headlines were captured by the larger companies like Sonrai Security, Introhive and Resson, but its scaling ventures also performed well in 2018. Companies like Smart Skin Technologies, Beauceron Security and Chinova Bioworks raised seven-figure rounds. The portfolio also included two exits in 2018 – EhEye and Envenio. With Jeff White taking the helm in 2018 as CEO, the group is engaged in more regional projects than before, such as its agreement with Innovacorp to invest in companies graduating from Propel's Incite program, Phase 2.

Pelorus Venture Capital

The manager of the Venture NL fund has built a dynamic portfolio of companies in just four years. Venture NL so far has invested \$6 million in the seven companies. The six active companies have received equity investments of \$14.6 million from other sources, including Killick Capital, the St. John's investment group that has invested in many of the same companies. These six companies employ 128 people, with an average salary of \$75,000. The group is now considering raising a second fund after the investment period in new companies ends in May 2020. ■

8.4 Local Incubators or Co-Working Spaces

Genesis - www.genesiscentre.ca/home

Michelle Simms

What started off as the commercialization centre of Memorial University has become one of the major hubs for entrepreneurship in the region. In 2018, Genesis moved from MUN's main campus to the Battery Campus on the slope of Signal Hill. The move tripled the organization's capacity and placed its resident companies closer to downtown St. John's. Under the leadership of CEO Michelle Simms, the centre has taken over the Common Ground co-working space and launched a micro-fund. The centre's programs include the Evolution program for new companies, the Enterprise program for scaling companies, and MOTR, offered in collaboration with the MaRS Innovation District. It also hired Dyanna McCarthy in 2018 to head its Women in Entrepreneurship program.

Planet Hatch - Planethatch.com

Fredericton

Adam Peabody

Planet Hatch is a co-working space in Fredericton's Knowledge Park and has established itself as the hub for startups in the New Brunswick capital. It features a range of services and events, including two different programs on sales or exporting. The organization changed direction in 2015 and decided to focus less on tech startups and more on a broad-based support model for all kinds of entrepreneurship.

Venn Innovation - Venncentre.ca

Moncton

Doug Robertson

Formerly Tech SouthEast, Venn has established its Main Street office as the hub for innovation in the greater Moncton area, and its programs extend across the region. Its Vennture Garage has been turning out some interesting companies, such as Porpoise and Fytiv. In the past year or so, Venn has been expanding to be more than a Moncton-focused organization and is offering support to companies across New Brunswick and the region. It partnered with ACOA in 2017 to offer a pan-regional program in competitive intelligence, hosted by University of Ottawa professor Jonathan Calof.

Volta Labs - www.voltaeffect.com

Halifax

Jesse Rodgers, CEO

Volta tripled its size and broadened its scope in 2018, so it now occupies a unique position in the Atlantic Canadian community. Its physical space comprises three floors at the Maritime Centre in downtown Halifax, including ground floor retail space, and serves as the anchor for Halifax's innovation district. That means Volta provides a place where the general public can come to learn what the movement is all about. Led by CEO Jesse Rodgers, Volta had 45 resident companies as of June 2019, and 40 alumni companies.

As well as providing work space for operations ranging from one to 30 people, the organization offers a range of services. The Startup Bureau offers resident companies a group of mentors to help guide their businesses. Volta in 2017 launched the Volta Cohort, a pre-seed funding program that as of May 2019 had provided more than \$500,000 to 21 companies.

The Volta team has been bolstered in recent years so it now comprises 16 full-time positions. Martha Casey, previously Chief of Staff and Executive Director in the President's Office at Dalhousie University, joined Volta in 2018 as Chief Operations Officer. Chris Crowell became the Vice-President of Corporate Innovation in 2018.

to encourage established companies to set out innovation outposts in the facility. The organization now has three corporate outposts.

Navigate Startup House

navigatestartup.com

Sydney

Navigate opened in late 2015 as a base for the growing tech community in the second-largest metro area in Nova Scotia. It offers co-working space, subsidized offices for as many as four startups and a range of mentoring sessions.

Startup Zone - www.startupzone.ca

Charlottetown

Patrick Farrar

Supported by Innovation PEI and various community groups, the Startup Zone is a 3,600-square-foot facility at Water and Queen streets that opened in July 2016. It has enough space for about 16 companies and is a work zone for tech and innovation startups as well as other entrepreneurial pursuits. The organization in the spring of 2018 named Patrick Farrar its new CEO. In the past year, the curriculum has been placing a greater emphasis on teaching companies to sell and bring in early revenue.

Connexion Works

connexionworks.ca

Saint John

The co-working space on Germain Street opened in 2014. It offers space for small companies and hosts regular events. The organization behind it works closely with Enterprise Saint John and other community groups.

Ignite Labs

Yarmouth

Doug Jones

Ignite Labs opened in June, 2018, to provide an entrepreneurship hub on Nova Scotia's South Shore and southern districts. The facility offers mentorship and working space to companies in a range of sectors and offers specialization in ocean technology. ■

8.5 Life Sciences Organizations

EmerGence - emergencebioincubator.com

Charlottetown

Launched in late 2014, EmerGence is a virtual business incubator focused on life sciences businesses in the food, nutraceutical and pharma segments. Its portfolio companies include several based in Atlantic Canada, in other parts of Canada, and in other countries, and it has said it wants to grow into a more pan-Atlantic-Canadian organization. Emergence works with its group of mentors to identify the areas in which each company needs mentorship and find a leading expert in the field to help the company. The incubator also offers Specialist Services Projects, in which it will fund as much as 65 per cent of the cost of bringing in specialists to help a company with a specific project.

EmerGence had been led by Executive Director Martin Yuill, who left in the winter of 2019 to take a position in Ontario. The organization as of the spring of 2019 was searching for a new head. EmerGence is affiliated with the PEI BioAlliance, which coordinates programming for life sciences companies on the Island.

Natural Products Canada - www.nce-rce.gc.ca/NetworksCentres-CentresRe-seaux/CECR-CECR/NPC-PNC_eng.asp

Charlottetown

Shelley R. King

Headquartered in Charlottetown, the NPC helps companies across Canada that are developing products from natural materials. The federal contribution will be matched by over \$10 million from industry and other sources, for total funding of more than \$24 million over five years. It has been making venture capital investments in recent years, including in such Atlantic Canadian companies as Chinova Bioworks and Island Water Technologies.

BioNova - www.bionova.ca

Halifax

Scott Moffitt

BioNova is a not-for-profit that represents life sciences companies in Nova Scotia. It has about 65 members, many of which are life sciences startups in the province. The organization's big event each year is BioPort Atlantic, a conference held each autumn. And the highlight of BioPort is the BioInnovation Challenge, a pitching event for life sciences companies in the three Maritime provinces. By entering BIC, novice companies receive a range of mentoring sessions that culminate with the pitch at the competition.

The organization released its BioFuture 2020 report in 2018, which outlined future growth plans not just for the life sciences sector but also for BioNova itself. These include the launch of an accelerator to teach sales to life sciences companies.

BioNB - Bionb.org

Fredericton

Meaghan Seagrave

BioNB is the bioscience authority in New Brunswick for government, industry, and media, translating and communicating the business opportunities behind the science in a highly technical sector. BioNB builds and enhances new and existing businesses, supports technology transfer from public institutions and the private sector, and works to build a community and enhance collaboration among sector stakeholders. Like BioNova in Nova Scotia, the organization has progressed as the life sciences community in the province has grown. BioNB said in its (first ever) annual report for 2017 that the organization now works with 40 startups. ■

Appendix – Methodology

Over the past five years, we've established our annual startup analysis as the most comprehensive study of a regional startup segment available in Canada. The data comes from two main sources: our survey of startups, and Entrevestor's daily reporting on the community.

Our goal has always been to bring out the metrics on the region's startups, which we define as:

1. A company headquartered in Atlantic Canada, or with dual headquarters that include an Atlantic Canadian head office;
2. A company commercializing innovation;
3. And a company producing a product for the global market.

There are huge grey areas with these definitions, but we have tried to be uniform in applying the same standards across the region, year after year. We received 157 responses to the survey – representing almost one-third of the startups in the region.

We're able to supplement this survey with our deep knowledge of the startup community. Entrevestor has posted more than 4,000 articles on the community since September 2011

and has an intimate knowledge of the startup community. We conduct more than 200 interviews a year. We pride ourselves on reporting on all four Atlantic Provinces and have used this broad and deep understanding of the community to complement the results of the survey.

Wherever possible, we've used the largest sample size available. Preferably, we use the 486 startups we've identified. However, for some data we can only get information from the 171 companies that responded to the survey, or those that responded to the survey supplemented by other information. In each case, we have tried to be as clear as possible about the number of companies we've counted and how we arrived at the details.

Unless we state otherwise, all the data is as of Dec. 31, 2018. In most cases, we have rounded percentages off at the decimal point – we're collecting data that can best be described as messy, and it's a fool's game to be too precise in reporting growth. The important thing is the broad trends. For all grammar Nazis, we use the word "data" as a singular noun. (When's the last time you heard someone use the word "datum" in a sentence?)

We would like to sincerely thank the Atlantic Canadian startups that trusted us with confidential information. ■



About the Author

Peter Moreira spent more than 30 years in journalism in Asia, Europe and North America. He worked with The Deal of New York, covering M&A, private equity and VC markets in the U.S. and Canada for six years, serving four years as London Bureau Chief. At Bloomberg, he covered European and U.K. banking and finance. He previously worked for the South China Morning Post in Hong Kong, Knight-Ridder Financial in Hong Kong and Seoul, and the Canadian Press's parliamentary bureau in Ottawa. His writing has appeared in USA Today, the Globe and Mail, The Toronto Star, National Post, the Chronicle-Herald and the Independent on Sunday (London). Peter is a graduate of the Canadian Securities Course. He is the author of Hemingway on the China Front (Potomac, 2006), Backwater: Nova Scotia's Economic Decline (Nimbus 2009), and The Jew Who Defeated Hitler, (Prometheus, 2014). His first novel, The Haight, a murder mystery set in San Francisco's Haight Ashbury district in 1968, was published by Poplar Press in 2018 and the sequel, A Hitman on Haight Street, is coming out in the autumn of 2019. ■



By Peter Moreira, Principal Entrevestor
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