YYCTECH 2014

SPOTLIGHT ON INNOVATION

Calgary tech companies
Changing the world through innovation

Evolving the tech ecosystem
Building a foundation for success

Research proves sector success
Contributing to GDP, creating jobs and capturing markets

CALGARY HERALD

TECH REV

TECH TO BUSINESS
INNOVATE CALGARY

INSIDE

Ecosystem supports technology innovation,

Innovate Calgary: approaching commercialization differently

We are where entrepreneurs, researchers, investors, industry and partners take innovative technology ideas from concepts and startup companies to growing enterprises. Succeeding in the commercialization of an innovation or discovery is best not approached as a solitary endeavour. Engaging the support of the innovation ecosystem can dramatically accelerate the development and growth of a new company, and dramatically increase the probability of success.

Innovation is a contact sport; by working together collaboratively, greater results and accelerated success can be achieved. A new approach to nurturing commercialization — catering to the needs of the entire technology community — is necessary if we are to gain the traction needed to break the barriers that prevent innovation from becoming business. This is the new Innovate Calgary model; we support all stakeholders that contribute to successful commercialization, including entrepreneurs, researchers, small and medium enterprises (SMEs), early-stage investors and industry in general. We do this through offering a variety of programs and services, and by facilitating connections that help build successful businesses.

We are focused on building Innovate Calgary as the hub of the innovation community in Calgary and southern Alberta. We want to be there as entrepreneurs launch new companies as well as being there as the journey unfolds. We want to help directly when we can and connect entrepreneurs to other resources as appropriate. Southern Alberta's innovation ecosystem has what it takes to drive innovation to market spurring wealth creation and contribute to our economy.

— Peter Garrett, president of Innovate Calgary

Navigating the innovation ecosystem

Alberta has enjoyed a high economic growth rate over the last 20 years. Seeking to continue this growth, provincial, federal and municipal governments have established a wide variety of programs and services aimed at helping innovators grow new businesses. As a result, understanding the programs and navigating through the numerous organizations offering services and procuring the right resources to take innovations to the next stage can be a daunting challenge. Innovate Calgary is here to help you navigate the maze. Just Ask.

Over the past year, the federal government has increased the capacity of the National Research Council-Industrial Research Assistance Program (NRC-IRAP), introduced the Western Economic Diversification-led Western Innovation (WINN) initiative to strengthen growth capital in SMEs and introduced the Foreign Affairs

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drives economic diversification

and International Trade (DFAIT)-led Going Global Innovation program to stimulate international research and development partnerships.

In addition to numerous existing provincially led initiatives, this past year the Government of Alberta introduced the Accelerate Fund to maximize growth capital by co-investing in early-stage businesses with angels. Alberta Innovates also continues the highly successful Alberta Innovation Voucher program.

Alberta innovators are building a more diverse and robust economy each and every day. Innovators are creating opportunities for commercialization, investment and career growth in technology. Equally important, Alberta innovators are demonstrating the strength and ability of Alberta's innovation system in introducing new technologies to the marketplace.

— Hon. Dave Hancock, deputy premier and minister of Innovation and Advanced Education

Sourcing innovation

Alberta's universities and academic programs are ranked among the best in the world. They have attracted some of the best researchers and distinguished professors from around the globe, many of which have succeeded in licensing technologies or forming a tech company from their discovery/invention.

The University of Calgary is one of Canada's leading academic and research universities with innovation, discovery and entrepreneurism at the core of its vision. The pursuit of excellence in teaching and research programs drives the development of high-quality graduates to meet the needs of industry, to create new businesses through entrepreneurship and to commercialize new research driven innovation. The recently announced Hunter Centre for Entrepreneurship and Innovation at the Haskayne School of Business was created to shape a new generation of entrepreneurial thinkers, providing them the foundations critical to starting a viable business or to being "intrapreneurs" in existing businesses.

Innovate Calgary is the hub of the Calgary and southern Alberta innovation ecosystem, directly supporting the key needs of entrepreneurs and SMEs, researchers, inventors and early-stage investors. As a hub, Innovate Calgary can also connect you to the numerous other organizations in the ecosystem that are there to help grow new businesses. Getting the assistance to develop and grow new businesses has never been easier. Regardless of whether you need some quick coaching, a deeper mentoring relationship, training on building a business, or capital or space to grow your business, we are here to help. Just Ask.

The innovation ecosystem will continue to evolve and morph to better meet the needs of the community that it serves. This will result in further new programs, discontinuation of programs that have run their course, and the coming and going of support organizations. The innovation ecosystem must fundamentally be innovative itself. Innovate Calgary will be there to help you make sense of all of these changes.

Peter Garrett, president of Innovate Calgary.

In this publication, you will learn about exciting technologies developed in Calgary and about the people leading their development. Statistics derived from the TechRev Innovators 2014 survey are included to provide further insight into the sector. All of the companies featured have been recognized as TechRev Innovators between 2009-2014. TechRev is an initiative of Innovate Calgary.

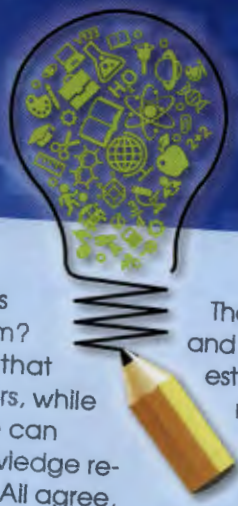
University of Calgary researchers are developing new technologies to help solve some of the most pressing global challenges faced by our society. By supporting world-class research and incubating new ideas, the University of Calgary continues to drive innovation in Canada's most enterprising city.

— University of Calgary president, Elizabeth Cannon

Our government is focused on helping small businesses develop innovative products and services. To accelerate business-led innovation in Western Canada, WD launched the Western Innovation Initiative. The $100-million five-year federal initiative offers repayable contributions for small- and medium-sized enterprises (SMEs) to take new and innovative technologies from test bench to market.

— Hon. Michelle Rempel, minister of State Western Economic Diversification

Innovation



Dan Themig, co-founder and president of Packers Plus.

So where exactly does innovation come from? Some would argue that people are born innovators, while others believe that people can develop the skills and knowledge required to be an innovator. All agree, however, that innovation often starts with a spark that ignites a passion to create, a drive to embark on a journey that is neither clearly marked nor easy.

That spark may be organic, personal and heartfelt, related to personal interest and experiences. Or, that spark may be more pragmatic — based on the opportunity to solve a problem, creating a market-driven solution. Wherever that intial spark comes from, innovation is regarded as the core of every technology company, the fundamental building-block of ongoing success and sustainability.

Groundbreaking innovation in Calgary

PACKERS PLUS

Perhaps one of the greatest demonstrations of game-changing innovation developed in Calgary is that of Packers Plus. Creators of the StackFRAC system, the first ball drop system used to complete horizontal wells in multiple stages, the company has truly revolutionized the oil and gas industry.

Reflecting on the genesis of Packers Plus and its incredible success, co-founder and president Dan Themig explains that he and his partners Ken Paltzat and Peter Krabben "decided right from the outset to be a high-value provider," allowing them to "compete at the highest level" in an industry that, at the time, was not known for innovation.

Themig recounts when the company was established in 2000, "the industry was into diversification, I told my business partners that we needed to be focused — pick a narrow technology and compete worldwide."

Deciding to address the most difficult downhole challenges in the oil and gas industry, Themig believed that "if we could be world-class at those, we could be game-changing... but we really didn't see it (the magnitude of the change) coming." The company's revolutionary technology launched the industry into a new realm — horizontal wells and shale plays.

Reinforcing the company's position as a world-leader — investing in research and development, launching new products and tackling new markets — Packers Plus has also revolutionized its operations. The company recently opened the doors of its MX Manufacturing Centre — the first of its kind in the world. This state-of-the-art facility includes the world's first robotic assembly of its type, and a testing and torqueing system that includes a proprietary traceability method that was developed in-house.

While innovation remains a cornerstone of Packers Plus' continued success, Themig points out that "we do a number of things to spark innovation."

Citing the company's annual technical conference, strategy sessions and workshops where people from the various business units contribute to the direction of the company, he shares that "people come with the expectation that we are going to be innovative, that they will see innovation and that they will be part of it."

> *Our best innovations are things no one is asking for. They are created based on a vision of what you think could be – and that comes from understanding a customer and what they're trying to accomplish. You have to have some vision beyond what you're seeing.*
>
> *— Dan Themig, co-founder and president of Packers Plus*

Lifecycle

It all starts with an idea — a solution to a problem, a creative concept, a revolutionary approach to something seemingly mundane. But then what? How does one turn a great idea into a burgeoning tech company?

Whether it starts as a research project in the post-secondary arena or as a response in the field to an issue facing industry, the entrepreneurial spirit of an innovator takes over in driving the development and commercialization of technology products and services.

Establishing a company — a foundation from which innovation can flourish — is a daunting task for many. As such, the journey of a technology entrepreneur is both exciting and tenuous.

According to Calgary Economic Development, "Calgary is home to the largest number of technology startups per capita in Canada" with a strong foundation of mentors, programs and organizations to support innovators in establishing and growing viable technology companies.

Douglas Hagedorn, CEO of Tactalis.

TACTALIS

Ever since he can remember, Douglas Hagedorn has enjoyed building things.

His family always had a small business on the go, and he'd be a frequent entrant at junior entrepreneur competitions.

Even while he was taking his master's in geography at the University of Calgary, Hagedorn was dreaming of starting his own business.

Today, the 28-year-old is CEO and founder of Tactalis (formerly Invinci), a Calgary-based tech firm that develops accessible computer interface hardware and software.

Hagedorn first got the idea behind Tactalis after looking at the way maps are designed for and then interpreted by visually impaired people.

"In university, I had looked at ways to create maps for people who could not see traditional maps," he says. "Things such as a Windows screen are, in many ways, just extrapolated from the way you would look at them upon an X and Y axis, which is pretty much what a map is. It is not too difficult to move from an arrangement which shows the capitals of Canada to one which shows my appointments for the week," he says.

"So we take a traditional computer screen and below that screen we build our own proprietary display, which you can activate by touch," adds Hagedorn.

Getting his company up and running has had its challenges. Not being able to hire people full time was the most difficult one to overcome.

"I started as a solo entrepreneur. The difficult thing in Calgary is finding people willing to give up an oil-and-gas-style wage or are able to contribute more than evenings and weekends."

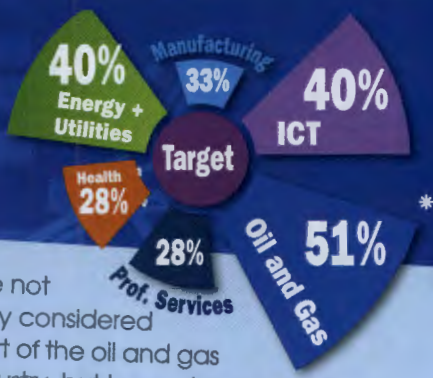
He credits his academic background in helping him overcome some of those hurdles, especially when it came to writing proposals for seed money grants.

"I have been fortunate in terms of the grants that are available for entrepreneurship. There is money available and a lot of it gets down to knowing how to write a grant application. I was lucky that I had some experience in that from academia," he says.

Hagedorn's advice for anyone hoping to start a technology company is simple: just do it.

"The biggest thing is to start doing it. You don't know what you don't know until you start asking permission and making mistakes," he says. "There are a lot of people in Calgary who will help you overcome the pitfalls, and it is important to leverage that network of people."

Subsectors



The advanced tech sector is comprised of a number of categories, commonly referred to as sub-sectors.

Traditionally, tech has been synonymous with IT (information technology) or ICT (information and communications technology.) While some regions still hold fast to that definition, Calgary's innovation ecosystem is much broader in scope.

The reality of living and working in Alberta is that everyone is, in some way, impacted by our resource-driven economy — even technology entrepreneurs.

While Calgary boasts diversity in innovation, generating some of the world's leading medical device diagnostic imaging and biotechnology innovations, it is important to note that local technology entrepreneurs are not only considered part of the oil and gas industry, but have also created game-changing solutions. Be it software platforms, wireless communications, digital media, geomatics applications or even cleantech solutions, many Calgary tech companies have capitalized on the opportunity to tackle the challenges of the oil and gas industry.

Wayne Sim, CEO and president of 3esi.

3esi

In the span of a few short years, Calgary firm 3esi has revolutionized the way the oil and gas industry does business. Yet the company's founders are no strangers to success.

Having launched several years earlier the successful tech company Hyprotech, which provides process simulation solutions for the oil and gas industry, they are, in fact, some of Calgary's most experienced tech sector veterans.

They had taken a ride on the startup rollercoaster of ups and downs before, and they knew about do's they needed to implement and don'ts they had to avoid.

So in 2006 when Wayne Sim, Sandy Moreland and Salvador Clave launched 3esi, a firm providing specialized software solutions for the oil and gas industry, they already realized the keys to success involved more than developing innovative technology and having great business acumen.

Based on their years of experience, they recognized a fine balance of both is required to grow a tech company from the ground up.

"If you focus solely on business success there's a high likelihood that you'll fail," says Sim, CEO and president of 3esi.

"If you focus solely on technology, there's also a high likelihood that you'll fail."

Instead, Sim, Moreland and Clave consulted with industry players first to find the software solution truly wanted and needed by these firms.

And only then did they set out to develop the technology to fulfil that need.

"Calgary is obviously an oil and gas town, so we talked to several companies about their biggest headaches in terms of problems," Sim says.

What they heard from some of the world's largest energy firms is a need for an information technology solution that is specifically designed and integrated to serve the day-in-day out business needs of running an oil and gas company — from finding and extracting the resources to refining product and bringing it to market.

"Our software understands the business from ground up — reservoirs, wells and pipelines — and it provides modelling for the physical assets owned by the business as well as the business operation side itself," Sim says. "It's not just about managing the dollars so much as how do the dollars manifest themselves in terms of the physical activities within the organization?"

Tailoring the concept of integrated business planning for the industry took a few years.

But once the team focused on developing a software solution that companies could use themselves throughout their organizations to plan, develop and produce energy, 3esi's business quickly took off. Today it is a leading provider of oil and gas software solutions around the world.

"Right now we're growing at a pretty rapid pace. Although we're global right now, we want to expand further into Asia Pacific and the Middle East. It's an essential ingredient for any tech company in the recipe for success" Sim says.

"With the ups and downs in these marketplaces, you need the ability to manage the economic cycles and a great way to do that is having geographic reach. If you look at the last recession, for example, South America didn't experience it," he says.

Still, rapid growth brings its own set of problems. Finding the right skilled workers is a perpetual challenge.

"As an industry innovator, we're working in a green-field marketplace so there are no ready-made practitioners," Sim says, adding on-the-job training can take 18 months.

"You can't find a business analyst or programmer who has done this kind of work, so you pretty much have to make them yourself."

Revenue Growth

Revenues generated by survey respondents increased by 30% in 2012 and were expected in increase by 5% in 2013.

REVENUES

Pre-revenue	16% of companies
<1M	40%
1-5M	27%
5-10M	9%
10-25M	6%
25M+	2%

PROFITABLE

YES	74%
NO	26% *

People often consider revenues and revenue growth as indicators of success for any business.

While that may be so, it can take years for technology companies to get to that point and even longer to get to a profitable state — simply due to the nature of technology research, development and commercialization.

Depending on the type of technology being developed and the type of customer being targeted, the path to steady revenue growth and profitability will vary significantly.

Technology entrepreneurs, like most entrepreneurs, establish goals and strategies to drive revenues and profits.

Unique to technology entrepreneurs is the requirement to sustain the demands of developing new products and services while expanding their geographic footprint.

Each entrepreneur will chart a course that aligns with their specific needs — leveraging a variety of resources, tools and strategies that will move them closer to their end goal.

SPLICE SOFTWARE

Finding a way to show value to clients is one of the key ingredients in the success of Splice, a Calgary-based voice messaging company.

The company, which was started in August 2006, is the fourth startup launched by Tara Kelly — two of them in the technology sector.

Since its inception, Splice has grown into a leading provider of cost effective human voice and video messaging, both in- and out-bound, and is aimed at helping clients reach out to customers in various formats.

Revenues have risen dramatically and Kelly, the president and CEO, foresees more rapid growth ahead as Splice moves increasingly into the potentially lucrative insurance and financial industries.

"We are a nimble company and I would say we are successful, but we are not going to rest until we are significant. Right now, we are not that significant, so we expect to double and double and double again," says Kelly.

"We have seen constant double-digit revenue growth. We've left triple digits, but we hope to get back there. When you get into the millions of dollars, it does get harder."

Kelly developed the idea behind Splice after witnessing first-hand phone interactions between companies and customers.

"I had a little bit of background as a developer and I was appalled at the normal phone interaction. I knew that these people knew everything about me, that all that data was stored, yet my experience was no better because of it," says Kelly.

Splice, which now has 20 employees, initially looked for a few customers to impress rather than trying a scattergun approach. It then designed a way to let those potential clients test its products.

It's advice Kelly believes startups should adhere to.

"Figure out a way to let people pilot your stuff," she says. "There has to be a way to try before they buy. Figure out a way to show your value."

Tara Kelly, president and CEO of Splice.

"Then find a couple of customers and don't just have a good relationship — make them raging fans."

Kelly adds being "six out of 10" on a wide range of things is not the key to start-ups' success.

"Instead, be 10 out of 10 on one thing, and that will give you the ability to wow people and excite them. Once you have made some money on that, then you can grow your road map in line with customers' needs."

Job Creation

64% of respondents hired new employees

The overall employee base grew by **13%** in 2013 *

Ivan Iantsevitch, CEO of TetraSeis.

Governments around the world regard job creation numbers as leading indicators of economic growth.

There has been a steady increase in new jobs created by local technology companies in recent years. It is commonly acknowledged that the No. 1 challenge faced by start-ups and early-stage tech companies in Calgary is people — attracting and retaining a solid team.

While job creation may be a key indicator of business or sector growth, viability and success, it is also a key challenge faced by technology companies who are competing with counterparts in the oil and gas industry for highly qualified, knowledge-based human resources.

It is difficult for small companies with limited budgets to attract and retain engineers, programmers, designers and business professionals.

Yet the lure to be part of something truly exciting and unique — part of a team of creative, focused and driven people; part of something that can change the world.

TETRASEIS

Competing for talent with the big boys isn't easy in Calgary's energy sector, but it is essential if you are to grow your business.

That's the message from TetraSeis boss Ivan Iantsevitch who's seen a year of rapid growth in his seismic data processing company.

The Calgary firm has grown from four employees to 14 in the past 18 months, and that growth is likely to continue if the company's technology successfully passes an ongoing test to check its suitability in the world of heavy oil.

TetraSeis, which concentrates on providing services, and its sister company Tesseral Technologies, which sells software, grew out of research by Iantsevitch's father Alex Kostyukevych.

He founded Tesseral in 1997 after working as a researcher at the University of Alberta in Edmonton and the University of Calgary.

"He felt the academic world wouldn't let him realize his ideas quickly enough so he decided it would be best to try something on his own. The family supported him and we found some angel investors who provided us with seed capital," says Iantsevitch, adding the company expects sales to double or triple in the next year.

The system his father developed (duplex wave migration) is used to find oil deposits that elude traditional imaging tools. It's now being tested to see if it works in heavy oil deposits.

To grow, the two companies — which share employees — needed talented staff.

"It is difficult because in this town, you need to compete for talent. Companies such as Shell and Schlumberger can offer way more than any small company can pay," says Iantsevitch.

Yet what small companies have to their advantage is the ability to offer someone the chance to be part of the decision-making process.

"Here, it is easier for a person to realize their ideas and grow. Many people prefer to be a big fish in a small pond than a small fish in a big pond," says Iantsevitch.

In hiring staff, Iantsevich says it's important to look beyond educational accomplishments.

"In geology and geophysics, experience plays a more important role even than formal training," he says.

"A person does not become a geologist by getting a master's degree in geology. They need to spend six or seven years under the mentorship of a senior geologist."

Iantsevitch also suggests looking as carefully at workers' personalities and technical skills.

"My experience tells me you should first look at the person — how he or she relates to others, (and whether) they are a team player — before looking at the resume," he says.

Iantsevitch adds startups should listen to advice and take advantage of mentorship and government programs — organizations such as the National Research Council, Canadian Environmental Technology Advancement Corporation — WEST and the Office of Energy Research and Development all provided great help to TetraSeis.

"Without their help, I don't think we could have survived the difficult times," he says.

"Now we must prove our technology for the heavy oil operations. Then I think the sky is the limit."

67% of respondents were successful in securing investment

24% received more than **$1M** *

Investment

If you were to ask any technology entrepreneur about the barriers to establishing and growing a company in Calgary, access to capital would be near the top of the list.

The very nature of launching a new technology — research, development, pilot, commercial launch — requires significant time, effort and money; often without the benefit of a revenue stream for many months or even years.

As such, tech entrepreneurs can access the capital required to kick-start or grow their companies in a few different ways: friends and family, banking institutions, government funding, debt financing and dilutive investment — commonly provided by angel investors or venture capital funds.

Accessing capital through investors can have a significant impact on the success of a technology company. While not a strategy for all, it is an increasingly common approach for tech companies in current times.

Byron Osing, co-founder and CEO of Calgary Scientific.

CALGARY SCIENTIFIC

Calgary Scientific CEO Byron Osing credits his company's success to its ability to secure investments early on.

"Without that funding behind us, we couldn't become a technology leader on a global basis in the way that we have," he says.

The company has two major divisions: one in health care (Resolution MD, an enterprise wide image viewer), and another focussing on cloud collaboration and mobility (PureWeb).

It was created in 2004 when Calgary Dr. T. Chen Fong approached Osing and others with the idea of creating technical solutions to problems in the health-care field.

Osing was previously the co-founder/CEO of Telebackup Systems Inc. and Launchworks/180 Connect, while president/CTO Pierre Lemire was CTO of Autodesk Inc. Infrastructure Division.

Having a team with a proven track record meant that when the company needed investment, they looked toward angel investors who had supported staff through other successful companies.

"We focused on financing our company through known business associates," Osing says, noting the company was purposeful in setting up a select group of individuals who would be great investors. "There was a trust factor there."

Aston Hill Financial Inc. remains Calgary Scientific's sole institutional investor.

Canada lacks the access to venture capital money that other tech-centred locales have, and Osing says having a staged process of knowing where your investment dollars will come from at different lifecycles of a company is vital.

Osing adds that successful companies in Canada, particularly in Alberta, need a strategy on how to finance through private networks or angel investors. They should use this strategy until their technology is well developed and proven, and solid initial customers have been established.

"Only then can you start to look for institutional money," says Osing.

When seeking investment dollars, Osing says companies need to clearly define what their story is, where they fit in the world and what problems their technology uniquely solves.

He also urges startups to understand that securing investment dollars is a lengthy process that takes a minimum of six months.

"You have to have enough gun powder to be able to last long enough to raise that next round of money," he says.

R&D
Research & Development

Whether undertaken by researchers at a post-secondary institution or by innovators in industry, research and development is generally the first phase in the lifecycle of a technology company.

This phase may take months or years, and often requires significant resources. As such, it is considered to be one of the most crucial undertakings leading to the success of a tech company — ultimately determining what the final product or solution will be.

That said, successful technology companies never stop innovating, bringing both updated versions and new solutions to market. As such, they never stop investing time, money and effort in research and development.

To ensure that technology is protected from unauthorized use, innovators will seek to secure patents for their intellectual property — providing them with a competitive advantage. Patents can also generate revenues for a company through licensing their technology for use by other innovators.

CoolIT SYSTEMS

After nearly 13 years of providing state-of-the-art liquid cooling solutions for high-performance desktop computers, Calgary-based CoolIT Systems continues to invest in R&D and file patents well into the company's lifecycle.

"We have never actually sold the same product two years in a row," says CEO and CTO Geoff Lyon, noting the tech company has a portfolio of more than 40 patents. "There is always an update, an upgrade, an improvement in the technology. The endless pursuit of innovation and efficiency are pretty critical to our existence. Our investment (in R&D) is one of necessity."

Founded in February 2011, CoolIT Systems focuses on providing a reliable liquid cooling solution for computers. Overclocking — the process of modifying a computer to make it operate faster than the clock frequency specified by the manufacturer — is a common practice primarily among gamers.

CoolIT Systems has since collaborated with industry leaders such as Apple, Dell, Delphi, HP, Intel and AMD.

Geoff Lyon, CEO and CTO of CoolIT Systems.

The liquid cooling industry has heated up recently, and the company is currently in a "phenomenal stage of growth."

"The industry has almost all at once unanimously said it's OK," says Lyons, noting the adoption of liquid cooling is happening five years after the company predicted it would.

In the first quarter of 2014, CoolIT Systems will deploy its first large-scale data centre cooling system. Lyon believes liquid cooling is also destined to become the thermal management foundation in the world of data centres.

CoolIT Systems has survived while others haven't because of its loyal customers, dedicated employees and "a will to survive" with the company's success, says Lyon.

Lyon lists risk as the biggest challenge the company has faced in the R&D process.

"We want to make as intelligent a judgment call as is possible, but there is always risk. The nature of R&D is you try things that are new and they may be successful or they may not," he says.

Finding and keeping quality staff in Calgary is also difficult.

"There is a huge demand for skilled engineering resources in Calgary. It makes it a challenge for a smaller company like us to maintain a strong group."

Lyon urges other local tech companies to invest in R&D throughout their lifecycles.

"We look at R&D as our lifeline to the future," he says.

Product Launch

The official launch of a new product is the culmination of years of hard work — in most cases, that includes creative ideation, mind-bending problem-solving, focused technology development, diligent testing and, finally, commercialization to take a product to market.

This is the point where a tech solution is made available for purchase or subscription by customers.

While go-to-market strategies for launching technology products may differ between products, companies and even markets, they all address key elements such as the product feature set, pricing model, marketing, sales and customer service. All of these pieces must work in concert to ensure the success and long-term sustainability of a technology company.

The work is not over once a product is launched. Keeping an eye on the competition and on the ever-evolving needs of customers, successful innovators will continue to evolve their products and launch new ones throughout the company lifecycle.

TEKTELIC

Building incredibly complex technical products from the ground up is easy for Tektelic Communications.

It's predicting what the market will be like months down the road, what competitors will be creating, and foreseeing the market potential that's a challenge.

"I'm an engineer and everybody in our company is an engineer," says Roman Nemish, president and co-founder of Tektelic. "(Our) biggest barrier is still trying to foresee the market and the market potential. It has to be done three years out."

The Calgary company develops small-cell wireless base stations, wireless backhaul systems and high-power radios and power amplifiers for international customers and emerging telecom equipment suppliers.

Nemish and David Tholl founded the company in 2009 after working together at Nortel for years developing wireless base station and radio solutions. When Nortel's Calgary R&D campus was shut down, the pair saw it as an opportunity to create a tech company of their own.

They launched Tektelic in February 2009 with a team of eight R&D members. Today, most team members have advanced degrees and 10 to 15 years of development experience.

Nemish says from day one, the company was determined to focus on a niche market with fewer competitors, rather than a "trendier" product, such as applications, to differentiate itself.

While the company focused on an area where their staff had high expertise, finding strategic customers was initially challenging.

"Starting a tech company in Calgary means you're starting a company in a location that's quite remote when compared to other similar companies located in Silicon Valley," says Nemish.

"One of the biggest challenges we had was to spread the word," says Nemish. "Another challenge is not underestimating how long it will take to create a product."

Left: Roman Nemish and David Tholl co-founders of Tektelic.

"From the time you start developing a product to the time you introduce it, it's an 18-month (or more) cycle," says Nemish.

"When somebody says they want this product, you have to really ask them is this decision not going to change over the next 24 months, or five years because you want to sell the product."

International Sales

Shelley Kulpers, CEO and founder of Chaordix.

One would think that the logical approach to establishing and growing a company is to start local — set up shop, sell to the local market, expand regionally and, once you have sufficient experience, go global.

While that may be the case for some companies — and while some companies may never expand their reach beyond the local market — that is not often the case for technology entrepreneurs.

There are numerous cases in which sales efforts are significantly focused on international markets, and in which revenues derived from international markets far outweigh those from local markets. In fact, it has been noted many times that local technology innovators seemingly have to prove themselves globally before they are deemed worthy of local business.

While that may be disheartening to some, it is a motivator to others who go on to tackle international markets with great success, establishing a network of international locations and personnel.

CHAORDIX

A seven-hour time difference with one of your main customer markets can make for long days and early mornings.

Yet that's just part of the job for staff at Chaordix, which opened an office in London in late 2013.

"The market really pulled us here," says CEO and founder Shelley Kuipers, who regularly commutes between Calgary and London, England.

"The number of customers that we were delivering in the London time zone, it just became material to our business."

Kuipers never set out to go global with her marketing technology company that provides an enterprise marketing technology platform and applications for predictive brand and product innovation communities.

But the nature of Chaordix's product meant there was global, not local, interest for the company's services.

While Chaordix has operated in Canada, it doesn't currently have any active Canadian customers. All of the company's business comes from outside of Canada. Clients include IBM, KPMG and American Airlines.

"Marketing needs at organizations beyond the Canadian borders are forced to be a little more competitive than Canadian companies. That's why we work global," Kuipers says.

The company, founded in 2009, has grown substantially since a rebrand and reposition in 2011.

Kuipers, who relied on her previous experiences at other tech companies when launching Chaordix, says the company was born out of a crowdsourcing community called Cambrian House.

After Chaordix launched in 2009, the first two years were spent trying to figure out what problems customers were trying to solve. After two years of market testing, the company re-launched in 2011 and has since emerged as a sought after global leader.

Taking the time to test the market has been a key to generating revenue globally, says Kuipers.

The nature of the crowdsourcing industry meant that in 2009, the company was early to market. Even now, its clients are early adopters of crowdsourced brand and product innovation.

In 2013, Chaordix tripled its growth and it's on track to do the same in 2014.

Chaordix employs a staff of 35 between its Calgary and London locations. Kuipers has her eyes set on continued global growth, including a potential New York expansion.

Opening a new international location was made easier by spending two years growing the company in London from Calgary. The international expansion was well-thought out and calculated, Kuipers says.

That being said, growing internationally hasn't been without challenges.

Kuipers lists finding capital to grow and quality talent as challenges the company is actively managing.

"How do we maintain our culture in such a high growth phase? That's going to be really important because our culture has really driven who we are and our success to date," she says.

Arrangements are being made to move some Calgary employees to London, as well as to hire new employees in the new market.

Ultimately a "flexible, dynamic, ambitious" team that's willing to work hard, at any time of the day, has been key to global growth," says Kuipers.

"If you are going to grow fast and global, you need to rely on your team," she says.

Strategic Partners

The stereotypical image of an inventor is one where they are secluded from the rest of the world, squirreled away in a desolate laboratory or workroom in the basement – emerging into the daylight only once their creation has been perfected.

As entertaining and as intriguing as they may seem, it is not a true reflection of reality in the tech sector. Technology entrepreneurs depend in large part on collaboration and teamwork to develop and commercialize their solutions. In addition to creating a solid team of employees, many successful tech entrepreneurs reach out into the ecosystem to leverage the expertise and resources of others.

While mentors and advisers play an important role in supporting technology innovators, more formal strategic partnerships with key industry leaders can prove to be invaluable. These strategic relationships can offer support to the individual components or the entire realm of a tech company from technology development right through to marketing and sales.

Trent Johnsen, CEO of Hookflash.

HOOKFLASH

Strategic partnerships are key to successfully growing a tech company.

Just ask Hookflash CEO Trent Johnsen, whose three-year-old start-up has already collaborated with industry giants such as LinkedIn and Microsoft to create free alternatives for voice, HD video and messaging.

"If you get good engineers and you publish good stuff, then you get to play with other good guys who are doing important work," says Johnsen, whose company, co-founded with Eric Lagerway, got its big break presenting at an International Engineering Task Force meeting. "It's about credibility. It's about the quality of your work."

He compares it to being a writer.

"You're only as good as your last story," says Johnsen. "Are you writing good stuff and putting it out there? Is it meaningful to the community that you and I are in? That is what has created all of our best collaborations and strategic partnerships."

The Hookflash open peer software enables businesses to integrate live voice, video and messaging into their own applications, websites and software.

Businesses then connect directly with employees and customers on mobile and web-enabled devices via social networks or private corporate directories. This provides businesses with enhanced communication systems while reducing those communications costs.

"We are collaborating with one of the largest players in the world to author the standard for web real-time communications," says Johnsen. "Think of it as the second coming of the web browser."

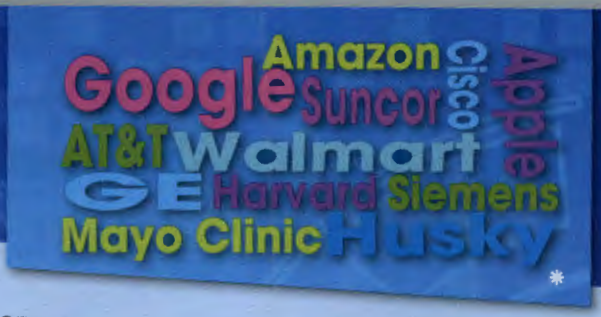
"Our core competency is building software. We don't deal with the end users. Strategic partnerships are critical to us."

Johnsen is no stranger to the start-up world. He worked at Shift Networks, a voice over Internet protocol (VoIP) provider, and he was a founder of Bryjon Communications, one of the first wireless dealers in Western Canada.

His advice to other startups? Stick with the vision, no matter the challenges to finance pre-revenue technology.

"The hardest thing is identifying the opportunity," Johnsen says. "But once you have that, just work toward it. Define the objective and start taking the first steps toward it."

Key Customers



The first step in getting a customer is knowing your customer — often referred to as the target market. While a technology company may not actually sell a product for many months or even years after they begin the process of developing their technology, knowing the customer from the very beginning of the process is important as it ensures that they develop a product that meets the needs of the customer.

Selling a product direct to consumers is much different than selling a product to a business and this is where a strategy for engaging key customers comes into play. The relationship a technology entrepreneur develops with a particular client can catapult them from obscurity to a state of global recognition. Often, first customers or strategic customers become integral to the development and ongoing evolution of a technology and, as such, tech companies are wise to know everything they can about their customers.

BENEVITY

Know your clients. Focus. And then follow through until the deals are inked. That's the advice for new start-ups from Calgary entrepreneur Bryan de Lottinville.

"A strategic focus on client segmentation and acquisition is absolutely necessary, especially for many technology or other startup companies that don't have tens of millions of venture capital to support them," he says.

"Most importantly though, they need to execute because all the best focus and strategy won't matter a hoot if you can't get those key relationships to buy what you're selling."

De Lottinville knows what he's talking about. He's the founder and chief executive officer of Benevity, a Calgary-based tech company that aims to improve the impact of corporate giving programs. Founded in 2008, Benevity offers global online solutions for volunteering and charitable donations. The company currently has 37 staff and services 45 countries, but does most of its work in Canada, the U.S. and the United Kingdom.

"A key element of relationship building for us has been to consistently execute with a level of professionalism, passion and client responsiveness that belies our relatively small size and makes change management more seamless," he says.

"Great technology is necessary, but rarely sufficient."

Bryan de Lottinville, CEO of Benevity.

There have been challenges. "Everyone wants to be innovative, but almost no one wants to be first," says de Lottinville. "A critical challenge for us was building our capability and base of client relationships to the point where a Fortune 100 company — and the corporate throngs involved in their IT procurement and implementation processes — would be comfortable in choosing us and acting as an early adopter."

So far, so good. Major Benevity clients include Ameriprise Financial, Canadian Pacific, New York Life Insurance Company, Roche Pharmaceuticals, and a Fortune 500-ranked producer of athletic gear and footwear.

"Since we needed early adopters, we also tried to focus on companies that showed progressive thinking or other indications of embracing innovation," he says.

But, he notes, his team had to be careful what they wished for once they landed those first few big clients. "These huge companies are used to getting what they want and are not bashful about asking."

That includes thinking about everything from data security to privacy to compliance issues, all the while "providing best-in-class functionality," he says.

Then again, de Lottinville is no stranger to big business transactions. He was the chief operating officer at iStock Photo, which was sold to Getty Images in 2006 for $50 million US. And before that, he was the executive vice-president of SMED International, a modular office furniture manufacturer that was sold for $250 million to Haworth in 2000.

In 2014, de Lottinville estimates Benevity will redistribute $150 million of charitable donations, "but in five years, if that isn't a billion, I'll be ashamed of myself," he says.

Benevity streamlines the giving process — tax receipts, donor contact lists, things that are "essential but not strategic" for a charity's success. Benevity's automated systems mean charities save money, so they can focus on what they do best: help people who need it.

"Since scale and transaction velocity are key to delivering on our vision for an aggregated, automated platform that drives efficiencies, we focused on acquiring a critical mass of something that would drive growth and take-up amongst all of the targeted constituents," says de Lottinville.

"In the context of our platform, that is gifts of money and time."

Product release Revenues customer
Cash-flow positive quarter **$1M revenues**
$1M deal International sale International location $1M investment secured *

Milestones

There is a certain timeframe during the course of a company's lifecycle when a number of firsts are achieved — when a concentration of milestones are reached. This is an exciting time for technology entrepreneurs as they finally see the fruits of their labour: first investment secured, first product launched, first customer acquired, first revenues generated, first cash flow positive quarter.

The milestones, though fewer and farther between, are no less significant as a tech company grows and evolves: first international sale, first million-dollar deal, first $10 million in revenue; $25 million; $100 million.

It is important to announce, recognize and celebrate the milestones that innovators reach along the way. Sharing such news, not only offers a pat on the back to the team contributing to the success, but it can also be a catalyst for engaging new investors, employees, customers and collaborators.

MOBOVIVO

It's been quite the year for Mobovivo.

The Calgary-based startup began the year with the gamification of the Academy Awards broadcast.

The company also signed a five-sport deal with ESPN, a leading global sports cable TV channel.

And it has since inked a deal with Time Warner Cable to "second-screen" the current season of the Los Angeles Lakers basketball games.

With the aid of the app, "You can predict who will win the game, whether a foul shot will be successful, who their girlfriends are, who's at the game," says Mobovivo CEO Trevor Doerksen.

"We work with the network and we're right there in the control room during the broadcast."

The idea for Mobovivo developed out of Doerksen's master's thesis research in educational technology and computer science at the University of Calgary.

The company now numbers about 20 people, as well as contractors in Brazil and partners in the U.S.

Doerksen cites studies that show TV viewers are distracted by their mobile devices every two to four minutes. And about 86 per cent of TV viewers are also engaging with a mobile device at the same time they're watching television.

How does a TV channel compete with the mobile distraction? How does a show or game engage and keep its viewers?

Mobovivo develops apps that create "a second screen beat during broadcast." Facts, trivia, statistics, videos and more are tracked down, edited and then published in real time on the app, for viewers who might otherwise change the channel in their search for constant entertainment.

So far, so good. The ESPN app launched in October 2013 and immediately became the No. 1 sports app in Brazil.

"You get more information about the athletes, behind-the-scenes information and photos," says Doerksen.

Trevor Doerksen, CEO of Mobovivo.

And this year, the Mobovivo team will tackle the FIFA World Cup soccer schedule.

There have been challenges along the way. Mobovivo created a second-screen app for AXN's Hannibal TV series. The series was broadcast in six languages in 18 countries. So was the app.

"My email inbox doesn't automatically translate, and neither do legal agreements," says Doerksen with a laugh. "Communication can be tough."

TechRev Innovators 2014

Benevity **www.benevity.com**
Benevity is a software social enterprise that offers innovative solutions and services to help power "Goodness Programs" across multiple applications.

Calgary Scientific **www.calgaryscientific.com**
Calgary Scientific revolutionized health care with its Resolution MD technology, providing collaboration for diagnostic health-care records over the web and on mobile devices.

CodeExcellence **www.codeexcellence.com**
Organizations of all sizes are using CodeExcellence's software quality monitoring and governance products to eliminate potential system crashing code defects.

Decisive Farming **www.decisivefarming.com**
Through its web software, My Farm Manager, Decisive Farming provides growers with a suite of services to increase the profitability of their farm business, from field to market.

Lumiant Corporation **www.lumiantcorp.com**
Lumiant Corporation's, TitanMade®, has the strength of steel alloys at less than half the weight, and can withstand temperatures up to 900°C.

MRF Geosystems Corporation **www.mrf.com**
MRF Geosystems is a Geographic Information System (GIS) company offering software products that have been licensed to more than 6,000 customers in 40 countries worldwide.

Nanalysis **www.nanalysis.com**
Nanalysis develops and manufacturers compact Nuclear Magnetic Resonance (NMR) instrumentation, providing of industry with spectroscopic resolution practically anywhere.

Packers Plus **www.packersplus.com**
Packers Plus revolutionized the oil and gas industry with the creation of open hole, multi-stage fracture stimulation systems.

Tactalis (Invici) **www.invici.com**
Tactalis has created a computer interface and online content store that allows visually impaired people to explore, edit and share digital media.

TEKTELIC Communications **www.tektelic.com**
TEKTELIC Communications designs and develops leading edge wireless products that address 3G and 4G coverage and data requirements of service providers.

TetraSeis **www.tetraseis.com**
TetraSeis develops leading edge seismic data processing technologies, setting industry standards in direct seismic imaging of sub-vertical discontinuities.

TechRev, recognizing success in advanced technology

TechRev, an initiative of Innovate Calgary, has established a framework to recognize and profile local technology companies, promoting opportunities for investment, collaboration and innovation. This framework consists of: TechRev Innovators — an annual recognition platform established in 2009 and the best-known of the TechRev activities; TechRev.ca — a website that shares news, feature articles and success stories about local technology companies; TechRev events — held to shine the spotlight on the milestone achievements of tech entrepreneurs while bringing the community together; YYCTECH: Spotlight on Innovation — an annual publication created to provide people with insight into Calgary's dynamic and vibrant tech sector.

Calgary's tech sector is thriving and our city is gaining a reputation for being a hotbed of innovation. Companies who have been recognized as TechRev Innovators represent some of the most forward-looking and promising tech ventures in the Calgary area. These companies are growing and making their mark on the world through innovation — and they have chosen to call Calgary home.

— Mayor Naheed Nenshi, City of Calgary

* *All statistical graphics in this publication were derived from the data collected through the TechRev Innovators 2014 survey.*