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**THE POST-VIRAL PIVOT:
HOW CANADA'S TECH STARTUPS CAN
DRIVE THE RECOVERY FROM COVID-19**



The **Innovation Economy Council** is an independent voice for the innovation ecosystem founded by MaRS Discovery District, Ontario Centres of Excellence, Communitech, DMZ, CCRM and Invest Ottawa. It brings together entrepreneurs and leaders from industry, academia and the investment community to drive Canada's industrial innovation policy.

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THE POST-VIRAL PIVOT: HOW CANADA'S TECH STARTUPS CAN DRIVE THE RECOVERY FROM COVID-19

Why startups matter

The COVID-19 pandemic is expected to push Canada into a deep recession. The economy will shrink at an annualized rate of 25 percent in the second quarter and as many as 2.8 million jobs will be lost, according to a Conference Board of Canada [report](#). As the crisis eases, governments will inevitably turn their attention from protecting citizens' health to rebuilding the economy.

To do that, the federal and provincial governments have already pledged hundreds of billions of dollars as they help businesses weather the short-term crisis and support workers. They have focused on the sectors hit hardest by the forced shutdown of economic activity — stores, restaurants, hotels, airlines and major manufacturers, such as car makers. Getting these industries up and running again is essential.

But it's also only a first step. Unless governments also invest in future growth, any recovery they create will be short-lived and shallow. We need to make fundamental changes if we are to emerge from the pandemic with new and lasting economic strength. While some have suggested that Canada needs to look to a "New Economy," the reality is that Canada's "Old Economy" of mature manufacturers, retailers and resource companies is already part of that New Economy.

All sectors of our economy depend heavily on a vast supply chain of technology companies to meet needs in areas such as cybersecurity, artificial intelligence, data privacy, e-commerce and clean technology. So, when the health crisis subsides, established companies will need innovators to navigate an increasingly uncertain world. To survive, companies will need to be resilient, nimble and better connected than ever — using tools that Canada's fast-growing technology sector are perfectly positioned to provide.

According to Blake Hutcheson, president of the Ontario Municipal Employees Retirement System (OMERS), the increasingly integrated economy that emerges from this crisis will present a raft of new challenges for Canadian business — from bigger government and more regulation to disrupted supply chains and financial pressures. Technology will become even more important as companies strive to do things "smarter, faster and cheaper," says Hutcheson, who runs one of Canada's largest pension funds. Consumer behaviour is already changing dramatically, he points out, as people are forced to become more self-sufficient.

"There will be more need than ever for adaptation, innovation, scaling up of solutions and breaking down of old ways," predicts Hutcheson. That's why, late last year, OMERS committed up to \$1 billion to its venture-capital arm, OMERS Ventures, because it wanted to focus on "this high-opportunity,

high-employment, high-growth sector,” according to Hutcheson. The case is even more compelling now, he says: “Now is not the time to take the foot off the gas. It’s the time to put it on.”

In fact, the COVID-19 pandemic has also acted as an accelerator, in some ways. In healthcare, for example, telemedicine has advanced by years in a matter of weeks out of sheer necessity. Practically overnight, startup manufacturers of medical devices like MOLLI Surgical and Thornhill Medical have teamed up with established players in the auto sector to produce swabs, personal protective equipment and other medical devices. InkSmith, an education technology company pivoted to produce face shields, and Trusscore repurposed its factory to make configurable temporary walls for hospitals.

“Out of catastrophes like this come the growth companies of tomorrow,” says veteran venture capitalist Sam Duboc, chairman and chief executive of MindBeacon Group, a Toronto-based online provider of mental-healthcare. With stress levels on the rise and Canadians unable to visit therapists in person, demand for virtual care is growing fast. “All things digital are becoming a day-to-day necessity, not a luxury,” Duboc says.

Tech startups already drive employment and growth

Even before COVID-19, Canada’s technology startups were part of a vital ecosystem of companies that were leading the country in job creation and economic growth.

For example, companies involved in computer systems design have added nearly 90,000 jobs since 2009, which is more than three times as many as the entire vehicle-manufacturing and auto-parts industry. Similarly, GDP in Ontario’s computer systems design industry rose 17 percent, while motor-vehicle manufacturing declined by 14 percent between 2016 and 2018. Over the same period, Canadian exports in services increased by 9.3 percent, or \$6.3 billion. These changes were accompanied by a 19.3 percent increase in licensing fees for the use of intellectual property.

This shift from a traditional to a tech-driven economy is being fuelled by the global demand for technology that makes Canada and the rest of the world safer, cleaner and more productive. These companies are not just a “nice to have,” they are an essential part of a 21st-century economy and enablers of strong, sustainable growth.

Unfortunately, the gains we have made can also be quickly undone.

The uncertainty caused by COVID-19 risks disrupting the flow of angel financing and venture capital that these early-stage companies need to transform into Canada’s next generation of technology superstars. Starved of fresh capital, startups could be hit particularly hard in a protracted economic slump. Modelling by IEC shows that a 25 percent drop in employment in the technology sectors where startups tend to cluster would wipe out 274,000 jobs across the country, including nearly 130,000 in Ontario.

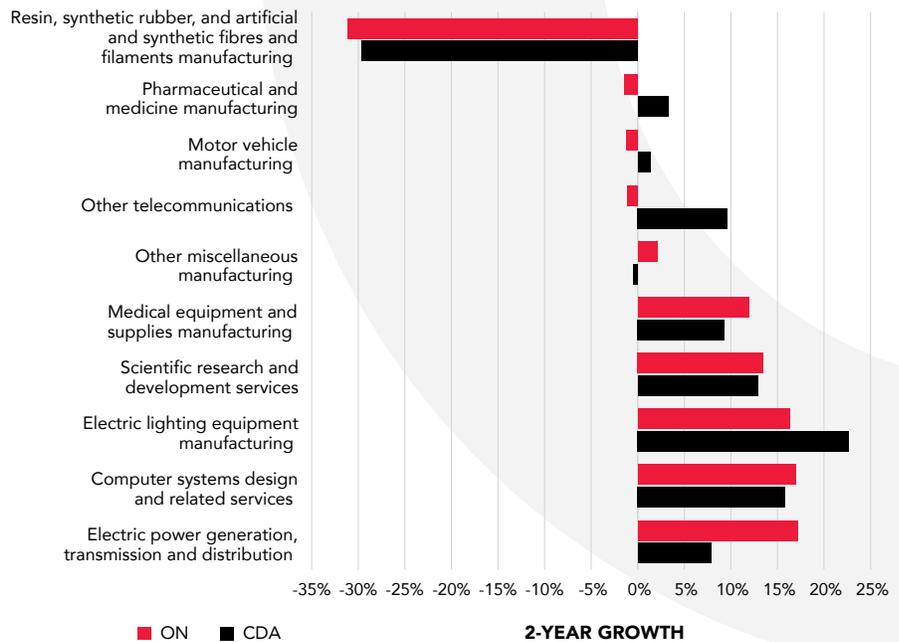
These sectors also have some of the highest rates of productivity and generate more economic output for every hour worked. A disproportionate share of job losses in these advanced industries would also damage productivity nationwide.

Through case studies of promising startup companies, this report demonstrates how Canada’s technology ecosystem is providing jobs and growth today, as well as new ideas that will power the economy for years to come.

Gordon Nixon, chairman of BCE Inc., former chairman and chief executive of Royal Bank of Canada and a director of MaRS Discovery District says that one of the great untold stories of the past decade is the proliferation of Canadian startups and technology companies. “Many large companies weren’t hiring after the 2008-2009 recession. Instead, much of the economic growth taking place in Toronto, Vancouver, Montreal and other cities has been driven by smaller companies with new ideas, products and visions,” Nixon points out.

“If a lot of these companies die, it’s going to be hard for the economy to get restarted and for jobs to come back,” Nixon says. “How do we ensure that these companies survive so that they can live to fight another day?”

2-YEAR GROWTH % COMPARING ADVANCED INDUSTRIES OF THE OLD ECONOMY TO THE NEW ECONOMY



Startups help advanced industries punch above their weight

Much of the innovation that will power the economy in the next decade will come from smaller tech startups that provide essential products and services in the supply chain. Canada’s big manufacturers, banks and retailers depend on these startups; their technology makes the rest of the economy more productive, competitive and innovative. For example, General Motors wouldn’t be making advances in autonomous vehicles without the help of dozens of small startups making advances in artificial intelligence, analytics and software neural networks. There are numerous examples of collaborations between

established automotive firms and startups. Global auto parts supplier Valeo has partnered with Sensor Cortek to build a new generation of high-definition imaging radars. And CloudDX and Faurecia are working together on biometrics monitoring system built into seat fabrics.

Similar advances have been made in fintech and healthcare software networks.

Technology companies that fall under the umbrella of “advanced industries” are uniquely positioned to support the country’s economic recovery, based on the findings of a 2018 report by the Washington-based Brookings Institution and the Martin Prosperity Institute at the University of Toronto. Advanced industries do significantly more research and development than most other businesses and employ a greater share of Canadian science, technology, engineering and mathematics (STEM) workers. These companies are also more likely to export their products and services, helping to make Canada globally competitive. They are also among a subsector of companies that spend an average of at least \$450 per worker annually on R&D and employ 20 percent more STEM workers than the average for all industries.

The IEC has mapped companies that have partnered with innovation hubs and matched their clients in the advanced industry sectors as defined in the Brookings/Martin report. The vast majority of hub clients operate in a clutch of advanced industry groupings that account for nearly 12 percent of Canada’s GDP and close to two million jobs. That’s more than 10 percent of the Canadian workforce, based on research conducted by the IEC. These sectors include companies involved in such fast-growing areas as artificial intelligence, clean technology and healthcare.

Advanced industries are creating jobs and growing a much faster rate than the overall economy. Employment in software publishing, for example, has grown nearly six times faster in Ontario since the 2008-2009 recession than overall private-sector job creation, and four times the pace Canada-wide.

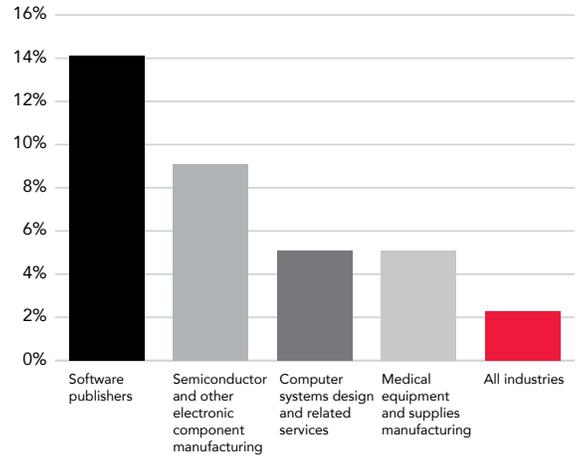
Likewise, GDP in the software industry has expanded at six times the pace of the overall economy in Ontario. Similar outsized gains in jobs and economic activity have occurred in other sectors where technology startups tend to cluster, including computer systems design, data processing, medical equipment, information services, clean energy and chemical manufacturing. For example, electric power generation, transmission and distribution saw a 9.6 percent growth in employment from 2009 to 2018 in Ontario, fuelled in part by new cleantech energy storage companies, such as NRStor and Hydrostor.

These and other advanced industry sectors accounted for roughly 8 percent of all private-sector employment in Canada since 2009 — creating 161,000 jobs, mainly in the service sector. Half of those jobs were in Ontario. And advanced manufacturing industries have accounted for 30 percent of all new factory jobs created in Canada since the 2008 recession.

Advanced industries are significantly outperforming the overall economy. In Ontario, for example, GDP growth has averaged 14 percent per year in software publishing since 2009, 10 percent in semiconductor and electronic

component manufacturing and 5.1 percent in both computer system design and medical equipment manufacturing. That compares to average GDP growth of just 2.3 percent per year across the economy over that period.

ADVANCED INDUSTRIES ANNUAL GROWTH 2009-2018



This chart shows job growth by the advanced industry sectors with the greatest growth compared to established industries.

The uncertainty caused by COVID-19 is threatening to not only stop, but reverse that progress. This, in turn, would make the entire country less productive. Economist Dan Ciuriak, a senior fellow at the Centre for International Governance and Innovation, says even more damaging would be the loss of productivity gains from the innovation that never happens due to layoffs, failed companies or a dearth of investment.

Lessons from the previous crisis

During the 2008 recession, the federal and Ontario governments pumped nearly \$14 billion into General Motors and Chrysler (now FCA Group). The objective then wasn't just to rescue the auto makers from bankruptcy — it was also to keep their supply chains intact. Shutting down GM and Chrysler would have devastated the companies' major suppliers in Ontario, creating a "cascading" effect would have put at risk other Ontario auto makers — Ford, Toyota and Honda — that relied on the same critical parts suppliers, explains Paul Boothe, a former top federal official who helped negotiate the 2009 bailout package.

The 2020 crisis is very different. It's not just a few companies at the top of the supply chain facing a cash crunch. This time, virtually all sectors of the economy have ground to a halt. As a result, the key will be to keep alive the vast and interconnected network of suppliers that are the main engines of growth for the economy — from multinationals to small tech startups.

"Entrepreneurs don't have balance sheets that can support debt," points out Boothe, who is now a business professor and manufacturing expert at Western University in London, Ont. "Banks aren't going to look at them unless someone is guaranteeing that debt."

It's not about picking winners, as it was in 2008. The key, he argues, is for governments to focus on making financial support broadly available to every company that wants and needs it. "You don't want the next tiers of the supply chain to disappear," Boothe says.

Startups are already essential

The pandemic has accelerated the pace of transformation in the workplace, in many cases from years to months or even weeks. It's speeding up demand for new tools to help people and businesses work, bank, shop, learn and interact online — while keeping hackers at bay. As this new world of work evolves and shapes the post-pandemic economy, technology will become even more important than it is today.

The tech companies that provide these tools are already deeply entwined in every facet of the Canadian economy. Our supply chains, our just-in-time manufacturers, our retail sector and our energy sector are already highly dependent on innovative, essential and enabling tech companies.

So it's not just tech startups that stand to lose from a recession — if they fail, vast sectors of the Canadian economy that depend on them will also fail.

For the Canadian economy to survive, these essential companies need to survive. Here are some examples of startups providing such tools:

Daisy Intelligence is transforming retail data analytics

When COVID-19 first hit, supermarkets saw toilet paper and hand sanitizer fly off the shelves. Then, it was frozen meals, canned goods and alcoholic beverages. Now, hair clippers and hair colouring products are selling out. "There is a battle going on right now because everyone's shopping behaviour has been thrown up in the air," says Gary Saarevirta, chief executive and founder of Daisy Intelligence, a Toronto-based software company that uses artificial intelligence to help retailers forecast inventory needs, predict what products to promote and decide how to allocate shelf space. "We're helping clients get through this and figure out what's coming next," he says.

Millions of shoppers are buying online for the first time. And that's shifting sales among retailers — store by store, day by day, in every product category. Our shift in habits is creating opportunities for some and losses for others. "This environment is a teachable moment for companies," Saarevirta says. "There is nothing anybody could have done to predict what the pandemic would cause. But the technology can help you react very quickly, and give insight for tomorrow that you couldn't figure out on your own."

Daisy Intelligence uses AI to sift through reams of granular real-time data, including transaction receipts generated at the point of sale. Saarevirta says computers are much better than humans at quickly sorting through this sort of data. They can spot patterns, such as what items are typically purchased together, and then make predictions about future sales.

The company's customers include Walmart Canada, Arkansas-based grocery chain Harps Food Stores Inc., and SpartanNash, a major U.S. food distributor based in Grand Rapids, Mich. Daisy Intelligence, a venture capital-backed startup with 50 employees, also works with insurance and benefits, including Green Shields Canada, to track claims for potential fraud.

Daisy Intelligence expects to grow faster when the crisis eases. But the short term is challenging, with much of the retail sector shut down. Saarevirta says companies are understandably reluctant to buy new software. The company has cut its workforce by 20 percent to help weather the crisis. He worries that the next round of venture-capital funding for the company, which has so far raised \$15 million, may be delayed, leaving the company in limbo at a time when rapid growth is within reach. "Our capabilities and services will be more valued than ever on the back end of this pandemic," Saarevirta insists.

Companies such as Daisy Intelligence fall into the computer systems design category of advanced industries. This sector has added nearly 90,000 jobs in Canada since 2009. Exports of computer and information services have grown by \$2.3 billion over the 2016-2018 period, accounting for nearly 40 percent of the growth in total service exports.

This is a broad category that includes a host of other new economy industries that range from Opus One, a company that develops software to help utilities better integrate distributed energy resources, and Ranovus, a company that works with data centre providers to reduce energy demands. Assent Compliance, a supply chain data management company, Advanced Symbolics, an AI polling, market research firm, and MindBridge AI, an AI-powered auditing solution fit into this sector as well.

LED Roadway Lighting is creating smarter street lights

Halifax-based LED Roadway Lighting Ltd. is a Canadian export success story. Its smart lighting products are installed in 60 countries around the world.

But the COVID-19 crisis has been a gut punch to president and chief executive Charles Cartmill. His company buys many key components, including castings, from suppliers in China. Shipments were temporarily halted in January as Chinese factories closed, forcing him to slow production. His backlog of orders is up, but revenue has tumbled 30 percent because he can't get the parts he needs.

Meanwhile, the company has invested millions of dollars to get its new Liveable Cities division up and running — part of an effort to lessen the impact of falling global prices for its conventional streetlights. The concept is to use streetlights as a platform to install a range of surveillance equipment, including traffic radar, cameras, motion sensors and air-quality monitors. With the COVID shutdown, however, it's been hard to get the attention of municipal officials and government funding agencies. And now cities are struggling with budget shortfalls.

"We're just launching this and we need municipalities to do pilots so we can prove the concept," Cartmill explains. "If we want to survive, we have to

move into new areas.” He’s convinced the product can save municipalities and utilities a lot of money by dimming lights when there’s no traffic and collecting valuable surveillance data at relatively low cost.

Companies such as LED Roadway fit into the electric lighting equipment manufacturing category of advanced industries. GDP in the sector has grown by an average of more than 6 percent per year in the past decade, more than double the pace of the overall economy. There are many other startups that are supporting so-called “old economy” firms. For instance, Miovision, a company based in Kitchener, Ont. has smart intersections and lighting systems in place in more than 17,000 municipalities worldwide.



Brendan Frey
Deep Genomics

Deep Genomics is speeding up drug development

Deep Genomics is a Toronto-based biotech firm that uses artificial intelligence to search for drugs to treat rare diseases. Obviously, during a pandemic, companies like Deep Genomics are invaluable. They’re also highly vulnerable.

Founder and chief executive Brendan Frey likens startups to saplings. They need loads of care and nurturing to stay alive long enough to grow and conquer the world. “Too much fertilizer and they die; too much water or not enough and they die,” he says of companies like his. “In that initial stage, everything has to be just right.”

A great strength of the Canadian economy has been the proliferation of new technology companies in the past few years. They’ve been seeded with government grants, along with angel and venture capital. But they need to spend and grow to reach the next stage of development. That next step could be commercializing a product, turning a pilot into a profitable venture or getting to the next round of venture capital investment. All the while, they’re burning through cash on salaries, research and development. “My concern is there are startups out there that could become billion-dollar companies, employing thousands of people,” Frey says. “But they could [also] be dead in the next six months.”

Deep Genomics is among the more fortunate startups, Frey reckons. It raised \$45 million in venture capital in January, giving it some breathing room. But the company has shelved a plan to boost its staff from 47 people to roughly 60 over the next 18 months. And it has temporarily closed its experimental lab, where half its employees work, because of the pandemic.

“There is a feedback loop,” he explains. “We need the lab to make the machine learning work better.”

Deep Genomics falls into the scientific research and development services category of advanced industries. The sector employs 5,300 workers in Canada. GDP has grown by \$175 million over the 2016-2018 period. It is also a biotech company, leveraging artificial intelligence to speed the discovery of new drugs.

Another group in the health sector, is medical equipment and supplies manufacturing which has seen a 23.2 percent growth in GDP between

2016 and 2018 in Ontario. The industry has seen a corresponding rise in employment of 12.3 percent in the same period, and includes such companies as InkSmith, an education technology company based in Kitchener. InkSmith recently launched a new company, The Canadian Shield, to produce 100 percent Canadian-made, reusable PPE face shields for front-line workers, and is working with Toyota Motor Manufacturing Canada to boost PPE production.

Peak Power is building a more sustainable grid

Conventional wisdom suggests that when electricity demand falls — like it has been during the pandemic — rates fall, too. But that's not what's happening in much of North America, where rates are often tied to the legacy cost of where power is produced, such as older hydroelectric dams or nuclear plants. "What's building is the perfect storm," explains Imran Noorani, vice president of strategy and corporate development at Toronto-based energy storage company Peak Power. "The less electricity that's used, the higher the unit cost goes."

That dramatically enhances the case for investment in the kind of energy-saving and income-generating power storage technology that Peak Power sells. Storage allows users to store electricity when rates are cheap and draw it down when needed. It also increases the efficiency of the wider power grid, by offsetting the impact of intermittent power sources such as solar and wind. That can reduce waste and greenhouse-gas emissions.

The company is currently running a storage pilot with crown corporation Ontario Power Generation and auto maker Nissan, which uses batteries, Nissan Leaf electric vehicles and energy utilization software to create small storage nodes that optimize energy use.

However, many of Peak Power's other customers, including large commercial building owners, such as Cadillac Fairview, Colliers, Oxford Properties and Slate Asset Management, aren't in the mood to spend right now. Many of their properties are sitting vacant as tenants downsize and send employees home.

"At the end of the day, no one is buying anything in this market," Noorani says. "It's hard to sustain interest in these kinds of projects in the current crisis."

So, the company is hunkering down and conserving cash by asking its 35 employees to take a 20 percent pay cut. The company has raised more than \$10 million in capital, but it needs about \$10 million more this year to grow the business, Noorani says. "If we don't raise money, we will die," he says.

NRStor is making energy storage more efficient

This crisis is a time to think boldly about the future Canadians want, NRStor chief executive Annette Verschuren argues. That means making big bets on technologies that can improve the healthcare system, cut greenhouse-gas emissions, make companies more efficient and feed the world.

"This is an amazing opportunity," says Verschuren, former president of Home Depot Canada. "Crisis is a time for change. Everybody is reflecting on what the new world is going to look like."



**Annette Verschuren, NRStor Inc.
& Linda Hasenfratz, Linamar**

It will also mean pivoting away from the way the country has always done things, including relying on so heavily on established sectors and industries, according to Verschuren.

For NRStor, a bold future means building more (and larger) electricity storage projects. The Toronto-based company's most ambitious venture is a proposed 250-megawatt battery complex that would be among the largest storage sites in the world — on the Six Nations reserve near Hamilton, Ont., in co-operation with Ontario's Independent Electricity System Operator.

The case has never been stronger for energy storage, which can improve grid efficiency, cut carbon emissions and lower costs. But it's been a tough slog for the company, acknowledges Jason Rioux, the company's vice president and chief development officer. Regulatory hurdles, resistance to change and a lack of commitment from companies and governments to buy Canadian are all holding the sector back.

"It is so hard to break through," adds Verschuren, who has spent seven years building the company. "Everyone knows storage is critically important to the grid, every company and every residence. But getting that done is really difficult."

Peak Power and NRStor falls into the electric power generation, transmission and distribution category of advanced industries — a sector that includes Canada's major power utilities. Energy storage helps the industry lower energy costs, improve grid efficiency and curb greenhouse gas emissions. Exports in the electric power generation, transmission and distribution sector are up 23 percent since 2009. In Ontario, jobs in the sector are up 10 percent over the same period.

Other examples include BluWave-ai, a company that creates SaaS-based solutions to optimize smart grids for increased affordability, reliability and sustainability, as well as Hydrostor, a developer of compressed air energy storage technology.

After COVID-19, startups will help everyone pivot

Technology companies are a vital part of a deep supply chain that provides many of the unseen products and services that drive the success of most front-line businesses. Successful Canadian software companies, such as Shopify, OpenText and FreshBooks, provide essential tools that make even the big brand businesses more productive and profitable. For the sake of the broader Canadian economy, companies like these need to survive.

Fortunately, many should. Startups and tech companies are nimble, so they're often better positioned to pivot to support their clients and help the economy become more resilient, which is critical as global supply chains cope with massive disruption.

In fact, according to the Harvard Business Review, one of the lessons of 2008 is that some companies will not only survive but thrive during a recession. Businesses that successfully pivoted during the 2008 recession (while taking

a responsible approach to their expenses) were the ones that succeeded. Companies, such as Netflix, Amazon, Groupon and Uber, thrived and grew during 2008 and the growth these recessionary high performers experienced was lasting.

The lesson for COVID-19 is that Canada will need massive investments in health-related research and development to protect people and the economy from future pandemics. Money will need to pour into the search for diagnostics, therapies, vaccines and new ways to deliver healthcare remotely.

Beyond healthcare, other Canadian companies are also pivoting to meet new demands and opportunities while building flexibility into the business models of their established clients.

These existing, essential tech companies that pivot together with their clients are the players that will help the Canadian economy bounce back. Here are some examples of such companies:



Naheed Kurji
Cyclica Inc.

Cyclica is identifying promising treatments for COVID-19

Toronto biotech company Cyclica abruptly shifted gears in the early days of the pandemic, offering its expertise to drug companies scrambling to find COVID-19 treatments. It offers the help of computer modelling, artificial intelligence and genomics to rapidly test the potential of already approved drugs.

“The future that we have been talking about for years is now in the present,” says Naheed Kurji, president and chief executive. “We’re in a fortunate position compared to the vast majority of other businesses. Our business has sped up.”

The company put a seven-person team to work on the COVID project in late January. So far, Cyclica has identified several promising molecules that could be fast-tracked for further testing and clinical trials by drug companies. Cyclica said it has shared its data with research institutes and biotech companies around the world. “It is a moment in time,” Kurji explains. “We’re all in the business of helping patients and making better medicines. What better time to do that than when there is a pandemic and a global calamity?”

The pivot for Cyclica, whose main line of business is developing medicines to treat complex mental disorders, comes as drug makers are scrambling to repurpose older drugs. Many of their “wet” labs are shut down to prevent the spread of infection, but Cyclica doesn’t need to work in a lab. Instead, it’s using computational drug discovery techniques to test 10,000 FDA-approved drugs as well as molecules for which there are known critical safety data as possible COVID-19 treatments. The work involves testing these drugs and tracking interactions against a large database of the thousands of proteins in the human body. Cyclica is also testing how these drugs might work on a specific population of people with COVID-19, based on known drug interactions.

“The idea of finding a new home for an old drug is very appealing,” says Kurji, who likens the process to finding “the right key for the right lock.” He hopes the effort will buy time for researchers who are working to develop a

COVID-19 vaccine, which could take another year to 18 months.

Cyclica plans to hire seven to 10 more people in the next few months to cope with the growing workload and to the company's existing business of developing new drugs to treat such disorders as depression, bipolar disorder and schizophrenia.

Cyclica falls into the pharmaceutical and medicine manufacturing category of advanced industries. Since 2009, employment in the sector is up 6 percent and GDP is up 12 percent. The company uses genomics, computer modelling and artificial intelligence to speed the development of new drugs, including promising treatments for COVID-19.

There are a number of exciting firms that fall into biotech categories, including Antibe Therapeutics, which is developing safer, non-addictive therapeutics for pain and inflammation; Spartan Bioscience, which is bringing sample-to-result DNA testing systems to medicine, and panCELLa, an early-stage biotech firm that is providing safe therapeutic cell products.



Tealbook is helping companies deal with disrupted supply chains

As the pandemic upends global supply chains, suddenly everyone wants Toronto-based Tealbook's massive database containing profiles of millions of suppliers around the world.

With borders suddenly shut down and travel bans in place, businesses are scrambling to find alternative sources or cheaper inputs. Some are ramping up production; others are cutting back. Some are making new products for the first time, such as CAE and GE, which have started making ventilators. Likewise, many employers are trying to find items that have suddenly become essential, including protective masks and gloves for their workers. "Supply chains have been impacted in so many ways," points out Stephany Lapierre, Tealbook's chief executive.

The company suspected that its database would become a must-have tool in this crisis because it allows businesses to quickly locate the products and services they need. So Tealbook quickly shifted gears. When the pandemic hit, the company switched from selling its services at conferences to an online marketing strategy. It began offering limited free access to its database and changing its pricing model to make use more affordable. Within weeks, it has doubled the number of organizations licensing its platform.

Lapierre says several larger deals are in the works, including a 600-user site licence with a major global food company and multimillion-dollar licensing deals with U.S. government agencies. "It could be game-changing for us," Lapierre says. "COVID-19 is raising a lot of issues that supply teams have ignored for a very long time. Having a strong data foundation gives companies the agility they need to respond to events like this."

Clothing company Brooks Brothers has used Tealbook to find materials to make masks for the first time, and it's now produced more than 100,000 of them. GM, Bristol-Myers Squibb, the World Health Organization and major

U.S. cities are also using the database. That's on top of a client list that already included blue-chip companies such as pharmaceutical company Allergan, auto-parts maker Husky Injection Molding Systems, insurer Humana and Federated Co-operatives Ltd.

Tealbook expects to increase revenues this year. And it's staffing up, growing to 30 people, including interns — up from 16 at the end of 2019. Lapierre says this success may allow the company to speed up its next round of financing. "We're cautiously optimistic about this year, and the impact [the crisis] has had on our value, revenue and growth," she says.

BioConnect is developing touchless security solutions

In the dark early days of the COVID-19 pandemic, BioConnect chief executive Rob Douglas and his management team started brainstorming about how they could respond. It was a dual-purpose exercise: They wanted to help customers deal with the pandemic, but they also wanted to grow their business.

The 11-year-old company provides building access security systems for critical infrastructure sites, including data centres, drug labs, banks, utilities and tech companies, to more than 1,600 customers across the U.S. and Canada. The challenge specific to the pandemic is that most of these systems use fingerprint identification pads. "In the physical-access world, everybody is touching something, and COVID-19 can live on things," Douglas notes. "How do we create a future where people can return to the office and not touch something?"

So BioConnect decided to speed up the rollout of an access system that adds facial and voice recognition sensors to its platform. To drive sales, it's offered deep discounts on equipment and 90-day free trials of the service. For customers eager to deploy more quickly, BioConnect can tap into employees' smartphones for facial recognition, instead of installing cameras. "We've got one solution that is incredibly scalable," Douglas says. "Our technology can light up all sorts of access points very quickly and allow people to do face recognition off their mobile phone."

Douglas's customers don't just want to stop people from touching things. They also need to keep infected people out and operate the system remotely. And it's working. Douglas says customers are calling every day looking for alternatives to fingerprint-based systems.

BioConnect is already developing the next phase, including using mobile phones to get employees to confirm their health status and report recent travels or contacts with infected people. Remote thermal scanners could also be added to systems, denying entry to those showing high temperatures.



Rob Douglas
BioConnect



Anna Chif
Dialogue Technologies

Dialogue Technologies is easing the strain on the healthcare system

Telehealth was already a growth business before the pandemic. But the crisis has made it a necessity, as social-distancing bylaws and shortages of protective gear keep doctors, psychologists and other health-care professionals from seeing patients in person. “COVID-19 hit and we saw a massive demand increase for Canadian companies for telehealth,” says Jean-Christophe de Le Rue, director of public and government relations for Dialogue.

The Montreal-based company has added hundreds of new corporate clients since the pandemic began, driven largely by the desire to improve access to workplace mental health, de Le Rue says. As a result, the number of people with access to its various services — typically paid for by employers or insurers — has grown from 400,000 to five million. Among Dialogue’s corporate clients are Sun Life Financial, National Bank of Canada, Industrial Alliance, Lightspeed, Air Canada Vacations and Stingray Group.

To cope with the surge in demand, the company is also hiring aggressively, with plans to triple in size to 600 employees in coming months. The new hires include physicians, nurses, therapists, technology support, app developers and salespeople. The company has also introduced a free virtual tool, Chloe, that allows Canadian to get answers about the latest pandemic information, travel advisories and advice from public health officials, catered to where people live. Tens of thousands of people have already used it.

“We and others have been preaching the benefits of telemedicine for years, and it was working,” de Le Rue says. “This pandemic has led governments to push their doctors to use it. That’s a big shift. It relieves pressure on the healthcare system, increases the productivity of physicians and makes care more accessible.”

MindBeacon is connecting Canadians with mental health supports

A dramatic rise in demand for mental-health services is one of the unfortunate side effects of major crises, such as mass shootings, natural disasters and pandemics.

Demand for Toronto-based MindBeacon’s digital mental-health platform is surging. User traffic on its website, which allows people to get assessed and message with therapists, has grown tenfold since the pandemic began. The company has already tripled its workforce of therapists, which now number in the “low hundreds,” and will double and triple that again, chairman and chief executive Sam Duboc predicts. “These are really stressful times,” he says. “People are going to come out of this with massive issues of anxiety and PTSD. Workers are under a lot of pressure.”

After the crisis hit, the company launched a free online program, Stronger Minds, that allows people to get behavioural advice. Thousands of people have already used it. But the company’s main business is a virtual mental-health service that employers and insurance companies can add to their



workplace benefit offerings. The site works by putting users through a vigorous online assessment. The evaluation determines whether the platform can help address an employee's depression, anxiety, panic attacks, insomnia or post-traumatic stress. A therapist is then assigned, allowing a patient to message them as needed.

There are several startups working in in this field. For instance, Aetonix has been working on ways to address the increasing demands for caregiving solutions for home caregivers and those in group facilities. It has developed a mobile platform for remote complex-care management called aTouchAway that includes a COVID-19 screening assessment tool. And Welbi has built a platform to address key challenges related to social isolation of our elderly citizens in retirement homes.

A call to action

A deep tech slump would worsen the COVID-19 recession and delay recovery. With enough support, the technology sector will continue to outperform over the next decade. But the reverse is also true. If the pipeline of startups shrinks dramatically, taking jobs with it and hampering the ability of large firms to adapt, there will be a massive ripple effect across the economy, sapping the dynamism Canada needs to create jobs, ideas, supply chains and homegrown technology.

Many startups are struggling to hang on and will face grave liquidity problems six or nine months from now, worries NRStor's Verschuren, who is also the chair at MaRS and a director of several Canadian companies. "We need to protect these companies that have taken so long to build," she says. "To lose them in three months is crazy."

Without a healthy technology sector, everything the sector has delivered over the past decade will be at risk. Unless Canada can foster the next generation, Canadian businesses and governments will inevitably find themselves looking outside the country to buy what they need from foreign sources.

For Canadian innovators, workers and companies in nearly every sector, that would be an opportunity lost.

Executive Summary

All sectors of Canada's economy depend heavily on a vast supply chain of technology companies to meet needs in such areas as cybersecurity, artificial intelligence, data privacy, e-commerce, clean technology and advanced manufacturing. These technology companies have some of the highest rates of productivity and generate more economic output for every hour worked. A disproportionate share of job losses in these advanced industries would damage productivity nationwide. Critical support is needed so that these companies can fuel the economic recovery post-pandemic.

Tech startups drive employment and growth

The vast majority of hub clients operate in a clutch of advanced industry groupings that account for nearly 12 percent of Canada's GDP and nearly two million jobs.

Companies involved in computer systems design have added nearly 90,000 jobs since 2009 — more than three times as many as the entire vehicle-manufacturing and auto-parts industry. Many of these startups also support established companies, providing innovative back-end data solutions.

A 25-percent drop in employment in the technology startup sector would wipe out 274,000 jobs across the country — nearly 130,000 in Ontario alone.

Startups help advanced industries

Advanced industries are creating jobs and are growing at a much faster rate than the overall economy. Employment in software publishing, for example, has grown nearly six times faster in Ontario since the 2008-2009 recession than overall private-sector job creation and four times the pace Canada-wide.

GDP in the software industry has expanded at six times the pace of the overall economy in Ontario.

After COVID-19, startups will help established corporations pivot

Startups and tech companies can pivot quickly to support their clients and help the economy become more resilient, which is critical as global supply chains cope with massive disruption. This is apparent with the number of startups that have partnered with established firms to create products that are working to contain the virus and support the community.

The IEC recommends the federal and provincial governments collaborate to implement stimulus measures that will build the physical and digital infrastructure that serve as the foundation for Canada's economy over the coming decades and incentivize technology adoption in our strongest industries. In addition to ensuring that we have the necessary channels to get our products to market, our companies must be leaders in the global digital marketplace. Policies should also focus on enhancing the resilience of domestic supply chains and promote collaboration between Canadian firms.

"Canada's economic recovery from COVID-19 will be led by our high growth, tech and innovation companies. If you map the ventures we work with to employment growth, the tech and innovation sectors have grown dramatically over the past two years, materially outpacing traditional industries. All sectors of our economy depend on our purpose-driven ventures to stay connected and nimble in times of enormous change. And we must have a cohesive game plan that is informed by data and evidence-based insights, reflecting the voices of our entrepreneurs, to drive smart policy decisions that give entrepreneurs every possible opportunity as they create sustainable economic advantage for our nation. Now more than ever, we need innovators to chart a bold new future for Canada."

– **Yung Wu**, CEO, MaRS

"The Innovation Economy Council represents a crucial next step in the development of Canada's innovation sector, so we can help our province and country win in the new economy. We intend to play a leading role in helping our country transition to a more secure, technologically advanced economy that breeds highly successful and dynamic firms, sectors, and supply chains."

– **Iain Klugman**, president and CEO, Communitech

"Canada's startup community galvanized to create common good in order to support its ecosystem through the COVID-19 pandemic. As a result, our lobbying efforts have seen more inclusive programming for small businesses across the country. We are the nation with the greatest immediate capabilities to make a positive difference. We can't miss the opportunity to focus on the positive difference we can make and continue to bring our talent and innovation to the world."

– **Abdullah Snobar**, executive director, DMZ

"As the COVID-19 pandemic emerged, the world was well into the fourth industrial revolution, characterized by the fusion of digital, physical and biological worlds. Startups were driving specialized tech into every facet of our economy. This is an economic watershed moment for Canada. As a nation, we can re-emerge as leaders, building on years of systematic tech startup cultivation and investment. To lead in this new world economy, we must protect and leverage Canada's tech startups to drive innovation, growth and job creation. The choices we make today will define Canada's economic future."

– **Michael Tremblay**, president and CEO, Invest Ottawa and Bayview Yards

"Canada is a leader in the science of regenerative medicine, including cell and gene therapy. Our growing ability to offer biomanufacturing and healthcare delivery in this sector will help propel the nation beyond being generators of licensable IP toward sustainable economic and health benefits — and global leadership in the life sciences."

– **Michael May PhD**, president and CEO, CCRM

"The health of our economy is inextricably linked to the health of our innovation ecosystem — highlighting the critical role the tech sector plays in the robust, interconnected supply chain that drives our economic strength. As global supply chains experience massive disruption, the ability of our startups and SMEs to collaborate and pivot is a central force in fostering economic recovery and resilience. By ensuring Ontario companies have the support, talent and tools they need, we can accelerate our transformation to the digital economy, fuel development of made-in-Ontario solutions and expand the local talent required to emerge as a global leader in technology innovation."

– **Claudia Krywiak**, president and CEO, Ontario Centres of Excellence