



DIGITAL  
TECHNOLOGY  
SUPERCLUSTER

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# Accelerating **Canada's Future**

# ADAPT. LEARN. OPTIMIZE.



Driving Canada's Future.

The Digital Technology Supercluster is stoking the engines of Canada's economic renewal through the development, deployment, and scaling of Canadian-made digital technologies to accelerate our return to prosperity and drive Canada's global competitiveness.

Canada's economic and global success will be driven by digital technologies to solve critical issues and capture massive opportunities, such as strengthening the resilience and sustainability of our healthcare system, combatting the impacts of climate change, protecting vulnerable citizens, advancing food security, and rapidly re-skilling our workforce.

This year, the COVID-19 pandemic accelerated the digital imperative. Powered by a growing community of more than 680 organizations, the Digital Technology Supercluster is growing a diverse and comprehensive portfolio of projects that leverage digital technology opportunities, drive the transformation of Canada's economy, build resilience across our healthcare system, create global platforms for securely sharing data and inspire courageous innovation.

## DIGITAL TECHNOLOGY SUPERCLUSTER AMBASSADOR



This past year, the Digital Technology Supercluster continued to build on its commitment to solving industry and society's biggest problems through digital solutions. Whether it be measuring the impact of climate change, training Canadians for skilled positions in the digital economy, or tackling the challenges COVID-19 has presented, the Digital Supercluster's approach to collaborative innovation contributed significantly to the strength of 'Team Canada'.



— **Honourable Navdeep Bains**  
Minister of Innovation, Science and Industry



**Government  
of Canada**

# ACCELERATING. MOMENTUM



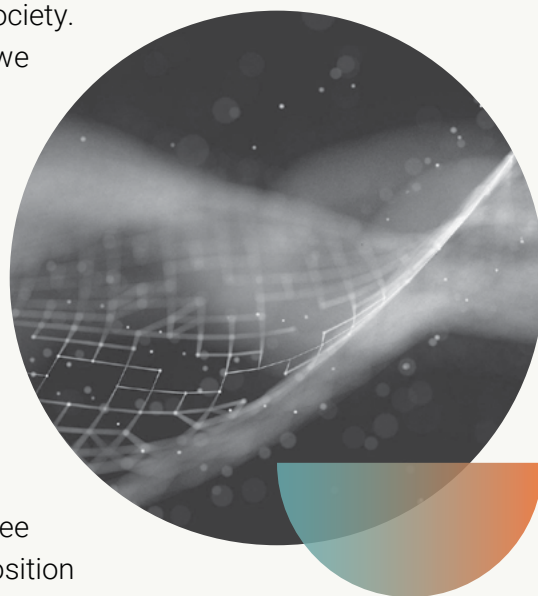
## A Message from the Board Co-Chairs

Bold ideas and innovation emerge at the intersections of society. Now in our second year, this Annual Report highlights how we have accelerated momentum through digital solutions created by our Members.

This year, we successfully completed two competitive calls for proposals, resulting in project investments involving more than 150 diverse Canadian organizations, 100 of which are small and medium-sized companies.

Projects selected will help to better understand and monitor the health of our planet, protect oceans from illegal fishing, and use data to improve treatments for autism. These are just three examples of more than **60 selected projects** that will help to position Canada as a global leader in digital technologies.

COVID-19 amplified the importance of digital transformation. We responded to this public health emergency with the launch of our **COVID-19 Program** focused on building the resilience of our healthcare system and enhancing our economic and social well-being. On behalf of our Board colleagues, thank you to our **dedicated Digital Technology Supercluster community** for their determination and the remarkable accomplishments made this year in building a better future for all Canadians.



— **Johanne Senécal**  
Senior Strategy Advisor,  
Government and Regulatory  
Affairs, TELUS



— **Edoardo De Martin**  
General Manager, Vancouver  
Microsoft

# BUILDING CANADA'S PROSPERITY: A MESSAGE FROM THE CEO



Working together to solve industry's and society's biggest problems



We embarked on this journey three years ago, with a collective vision to build a better Canada by working with industry and academia to solve some of our world's biggest problems.

This year we saw our Members apply earth observation satellites to improve our ability to detect and forecast extreme weather events, use computational

biochemistry to eliminate the need for chemical pesticides on our wheat crops, develop platforms that empower Canadians to manage their own health data, and leverage digital solutions to increase opportunities for women and underrepresented Canadians to explore and prepare for exciting careers in technology.

COVID-19 has unquestionably accelerated the need to digitize our economy. I am proud of our Members' ability to pivot and respond to COVID-19, developing and applying digital technologies to combat issues created by the pandemic while accelerating the extraordinary momentum started last year. I am grateful for the support and engagement from our Members, the guidance and thoughtfulness of our Board, the relentless dedication of the Digital Technology Supercluster team, and our partnership with the Government of Canada through ISI.

We are proud of our growth and accomplishments this year and are excited for the opportunity to help drive Canada's return to economic prosperity and capture our opportunities for global leadership in digital transformation.

Thank you for your support as we build the future of Canada, together.



— Sue Paish

CEO, Digital Technology  
Supercluster



# WHO WE **ARE**

The Digital Technology Supercluster brings together the brightest minds and leading names in health, natural resources, communication, transportation and tech to develop solutions that will fuel our global economy.



## OUR **PURPOSE**

From climate change to COVID-19, we are working to solve the world's biggest problems through innovative collaboration.

## OUR **VISION**

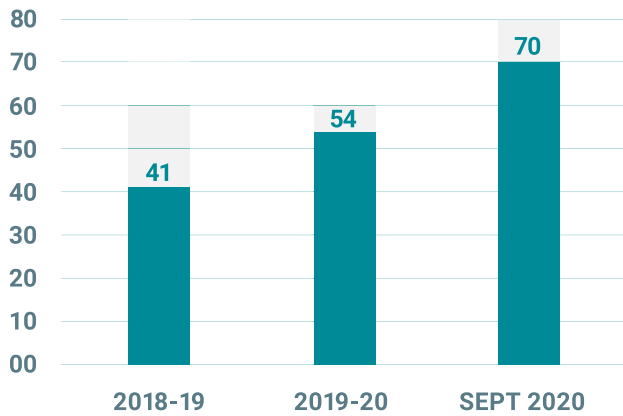
To position Canada as a global leader in digital technology through a supercluster that unlocks the potential of data in the era of the intelligent enterprise.

## OUR **MISSION**

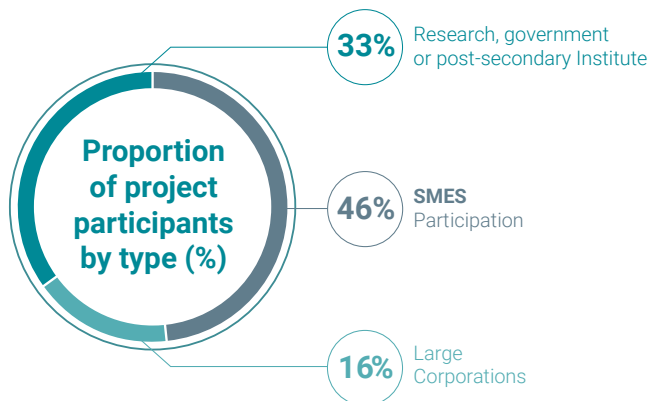
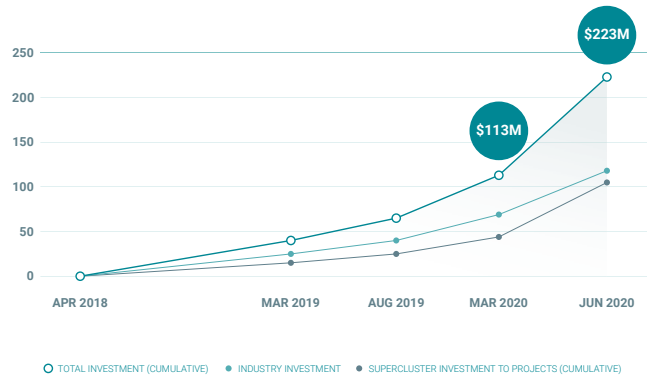
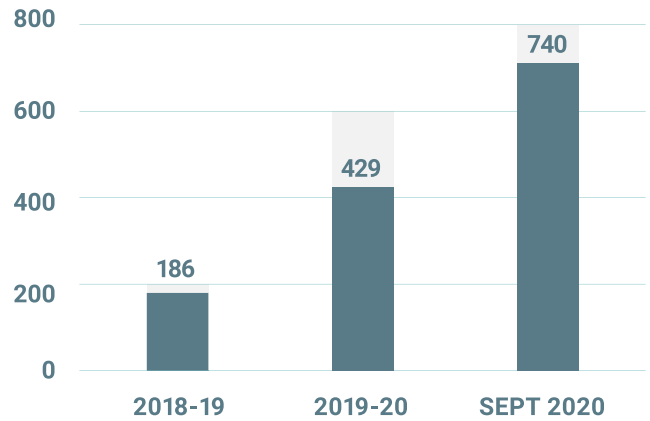
- Create a critical mass of world-leading digital technology companies in BC and Canada that develop innovative products, platforms, and processes;
- Transform Canadian industries through the digitization of business, prioritizing industry, specific needs and delivering productivity gains and competitive advantages at the firm and industry levels; and,
- Grow the economic benefits for the region and for Canada by generating new companies, scaling-up existing firms, enabling performance improvements in Canada's sectors of strength, and positioning BC as a global hub for digital technology innovation.



## MEMBERS



## ASSOCIATES



# OUR MEMBERS

## PROUD TO PARTNER WITH



We are working with more than 680 organizations from across Canada in sectors ranging from mining to healthcare, quantum computing and software development, to post-secondary education, super-computing, forestry and beyond.



# OUR PROGRAMS

The Digital Technology Supercluster is accelerating Canada's digital future through our dedicated program streams to fuel economic growth, and create thousands of new jobs across Canada.



## CAPACITY BUILDING

Partnering with employers, educators and community organizations to build job-ready, world-leading talent.



## DATA COMMONS

New business insights through new platforms to collect, store and analyze data.



## DIGITAL TWINS

Creating virtual replicas of production environments for real-time operations management, simulation, modelling and training.



## PRECISION HEALTH

Improving the prevention, early diagnosis and treatment of disease through innovative digital technologies for better health and wellness for citizens.



## COVID-19

Unlocking solutions to protect the health and safety of all Canadians and our economy through the development, deployment, and scaling of digital technologies.

IMPACT STORIES

## ENHANCING RURAL HEALTHCARE WITH MOBILE ULTRASOUND SCANNERS



BCIT grad Kris Dickie is Vice President of Research and Development at Clarius Mobile Health.

Unveiled at the beginning of 2020, the **Point-of-Care Ultrasound for COVID-19** project's overarching goal is to provide ultrasound bedside tools for doctors in urban, rural and remote communities. These advanced tools combine machine-learning technology, portable devices and a cloud-based platform to create an integrated point-of-care network that ensures accurate diagnoses for Canadians while reducing the need for specialized training.

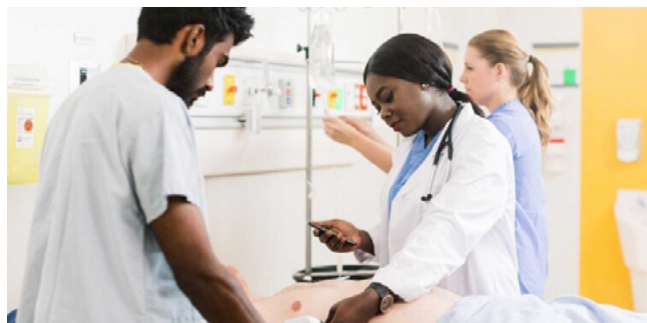
"It's about democratizing healthcare and eliminating the discrepancy between the quality of care in rural and urban areas," explains Professor Purang Abolmaesumi of the University of British Columbia, one of the seven organizations collaborating on the project.

The project initially targeted heart and pregnancy patients, but quickly pivoted in response to the pandemic, given the growing evidence that lung ultrasounds can reduce mortality rates in COVID-19 patients by speeding up the detection of pneumonia. The project consortium joined forces to deploy more than 80 Clarius handheld ultrasound scanners to remote communities and long-term care homes across B.C.

"Ultrasound has been a game-changer for rural care in general, allowing immediate diagnoses for triaging and expediting trauma cases to higher levels of care," said Dr. Virginia Robinson of the Fernie-based Rural Coordination Centre. "In five years, our goal is for doctors across the country and around the world to use handheld ultrasound as a primary tool for when patients first come into their offices," said Kris Dickie, Vice



Powered by artificial intelligence this project uses a small, handheld ultrasound that can be connected to a mobile device.



Clarius Mobile Health's handheld scanners provide real-time diagnosis of patients with pneumonia, potentially caused by COVID-19.



IMPACT STORIES

## THE POWER OF DIVERSE PERSPECTIVES

As part of the [Athena Pathways project](#), the Society for Canadian Women in Science & Technology (SCWIST) used the initiative's online job board to post a volunteer opportunity for a data visualizer. Fast-forward a few weeks and the organization welcomed not one but three young women in technology roles.

Like other projects in the Digital Technology Supercluster's Capacity Building program, Athena Pathways is helping Canadian tech companies fill job vacancies and become more competitive. In addition, this project is helping to ensure Canada's innovation ecosystem has the capabilities, talent and infrastructure to create good jobs, drive economic growth and enhance the country's reputation as a world-leading digital economy.

Led by MetaOptima, together with organizations such as SCWIST, the Artificial Intelligence Network of BC and Simon Fraser University, the 18-month project is connecting 500 women to pathways into the tech sector.

For instance, the online job board lists dozens of tech-related opportunities. An education page features courses highlighting the basics of artificial intelligence, machine learning and data science from the project's academic partners, which are offering hundreds of scholarships. Also, a mentorship page matches applicants with career role models. Classes and workshops mainly target female executives and leaders, while customized content and training is being delivered to girls in middle and high school.

"Joining forces with academic and industry partners is the best way to foster innovation and progress," says Maryam Sadeghi, CEO and Co-founder of MetaOptima.

"I can't think of a better way to achieve progress than to create equal opportunities for women to get exposure to real-world experiences in the AI and tech industry while completing their academic training."



## IMPACT STORIES

# GROCERY PROJECT DELIVERING HYPER-EFFICIENCY AMID A PANDEMIC

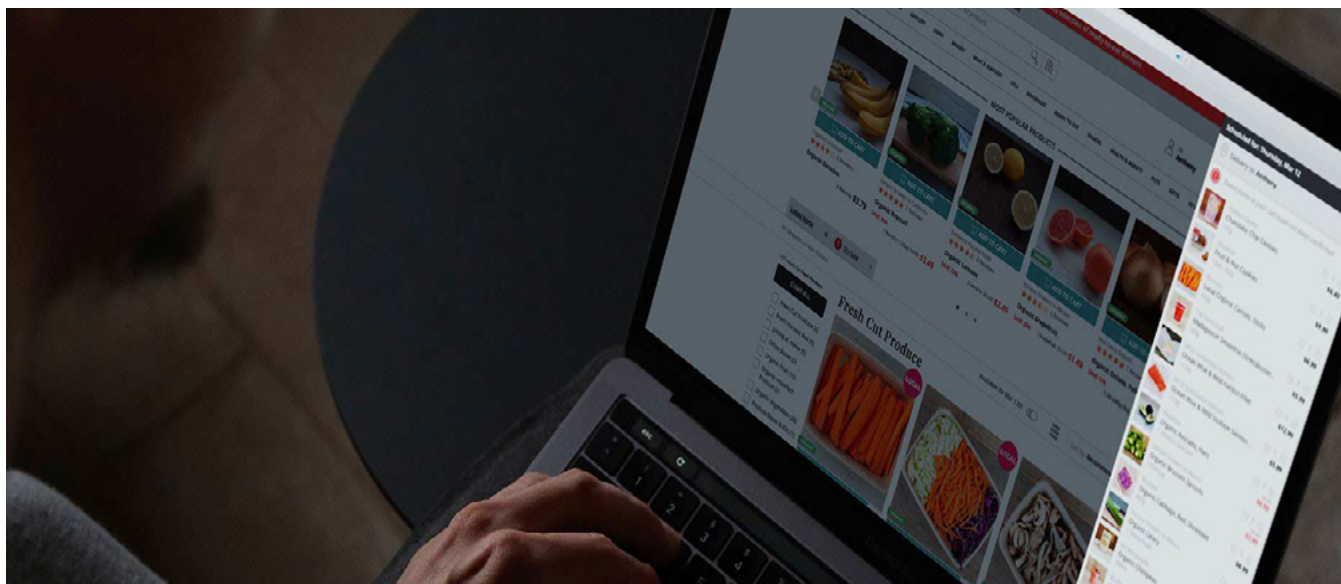
**Feeding our Frontlines**, an e-grocery software project is dedicated to ensuring food security for millions of Canadians.

In collaboration with Spud.ca, Adaptech, 1QBit, ETG and Microsoft, Food-X is developing foundational e-grocery software features to ensure that fresh, high-quality groceries are delivered to essential workers, hospital patients and other Canadians with health conditions in quarantine.

"The hundreds of letters and pictures we have received from children thanking us for helping to keep their parents safe highlights how it's all about doing the right thing in these difficult times," says Founder and CEO Peter van Stolk.

Using Spud's Stay Home boxes, the program is delivering ingredients for nourishing meals to those who need them most. "At-risk community members have always struggled to access food, but that problem has been exacerbated by the COVID-19 crisis," van Stolk says. "Now, frontline workers and people in quarantine are affected, too."

With demand for Spud's services spiking during the pandemic, the program has created hundreds of new jobs and hired many displaced and recently unemployed workers, van Stolk says. "Thanks to the Digital Technology Supercluster's support, we've been able to increase our capacity by two to three times in a very short period. I have been incredibly impressed by the organization's ability to pivot and rethink their process during this time of stress and find a way to pull together innovative companies across Canada."



SPUD has evolved from a local and organic online grocery company into an award-winning complete e-grocery management solution.

TERRAMERA

## COLLABORATING TO PREDICT NEW COVID-19 VIRUS STRAINS

As part of the COVID-19 Program, Terramera is now collaborating with other organizations such as Microsoft, UBC and D-Wave to predict COVID-19 virus variations before they emerge.

While Terramera continues to reduce synthetic pesticide use with its Actigate technology, it is now using computational chemistry, machine learning and artificial intelligence innovations to predict new virus strains and predesign medicines and therapies to help prevent future pandemics.

"The Digital Technology Supercluster presents an enormous opportunity to harness complementary areas of science across industry and academia," says Terramera CEO Karn Manhas. "By working together, we can help solve some of the world's biggest problems, COVID-19 included, with predictive technologies."

Since 2018, Terramera has nearly doubled its workforce and is slated to add up to 30 new employees in 2020. This growth, combined with its new partnerships, have allowed the company to pursue key genomics tech "much earlier than would have been possible otherwise," says Dr. Steve Slater, Vice-President of Strategic Initiatives. "The Digital Technology Supercluster has been instrumental in helping us form partnerships and expand the scope of our work. It has improved our access to top talent, great ideas and world-class facilities."

Terramera is also leading the [Precision Agriculture to Improve Crop Health](#) project, designed to prevent pests and protect crops while reducing pesticide use. This project is initially targeting wheat leaf rust, which threatens Canada's \$7 billion in annual wheat exports.



Terramera Rooftop Greenhouse features controlled climatic conditions that enable rapid experimentation, located downtown Vancouver BC



Terramera team showing their support for Anti-Bullying (Pink Shirt) Day.



SANCTUARY AI

## REDUCING THE SPREAD OF COVID-19 IN LABOUR-INTENSIVE ENVIRONMENTS



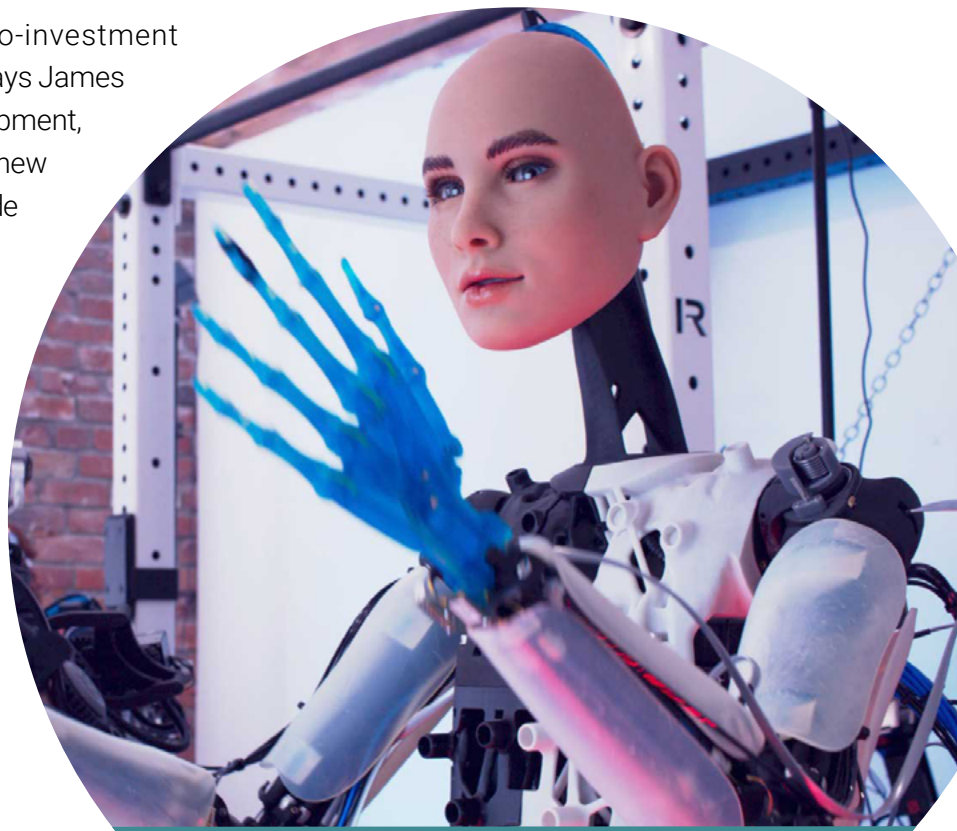
The ability to perform physical work remotely remains a weak link for Canada's economic recovery and renewal. That's where Sanctuary AI and the [Digital Telework Infrastructure for Remote Physical Work](#) project come in.

Sanctuary AI's innovative robotics technology is working to bring physical capabilities to remote workers by testing general-purpose robots in long-term care and clinical settings connected to 4G and

5G networks. Combined with the support of digital medical tools such as stethoscopes and biometric monitors, this innovative technology can help reduce the spread of COVID-19 in labour-intensive environments while improving patient care and outcomes.

The Digital Technology Supercluster co-investment made the project viable for Sanctuary AI, says James Wells, Vice-President of Corporate Development, and has spurred collaboration with several new partners. "The Supercluster's support made it possible for the consortium members to come together in less than 30 days."

The initiative is also laying the groundwork for a digital job infrastructure that can sustain safe and secure productivity during health crises, Wells says. "COVID-19 has presented the world with an economic and labour challenge unprecedented in modern times. Partnering with the Supercluster and collaborating with Microsoft, Expeto, UBD and AInBC to build a highly innovative and digital approach to job creation is a critical step in supporting Canada's economic recovery."



Example of Sanctuary AI's innovative robotics technology, working to expand video and audio capabilities of remote teleworking, such as in long term care and clinical settings.

IMPACT STORIES

## SAFEGUARDING OUR MOST PRECIOUS WATER RESOURCES



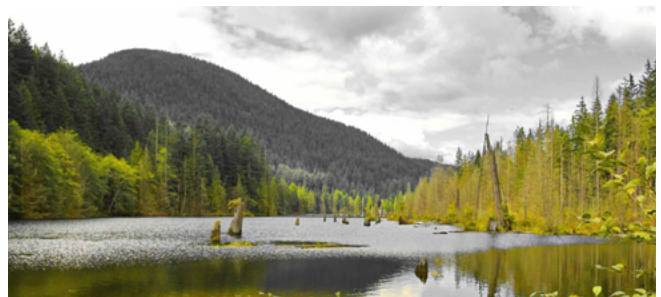
Global water consumption is predicted to rise 85 per cent by 2030, driving demand that will outstrip supply by more than 40 per cent. Despite these troubling predictions, Canada does not have a common approach to measuring, defining and leveraging data on the health of our myriad bodies of freshwater.

That void is being filled by the [Fresh Water Data Commons](#), a project led by Carl Data Solutions in collaboration with organizations such as Teck Resources, Astra Smart Systems and Living Lakes Canada.

Together, the team is developing a technology to help every part of Canada, and the world, harness data to protect supplies of freshwater and dependent ecosystems, foster sustainable development and monitor the impacts of climate change.

The group is initially focusing on an area in southeastern British Columbia. Living Lakes Canada and regional partners will deploy a network of low-power, low-cost sensors to collect real-time data on water quantity, quality, climate and precipitation. This data set will allow the surrounding Columbia Basin to be analyzed in real time and build a holistic understanding of the relationships between water quality, microorganisms and active industries in the area.

The project is also focused on preventing accidents and disasters through predictive analysis. For example, the new system can pull information from weather stations and overlay data from other groups. If a region gets a lot of rain in springtime, followed by a sudden snow melt, it can create a perfect storm for a tailings pond leakage and overflow. Running an algorithm, the system can sound an alarm when conditions start to become dangerous.





## 1QBIT

# FIGHTING COVID IN REAL TIME

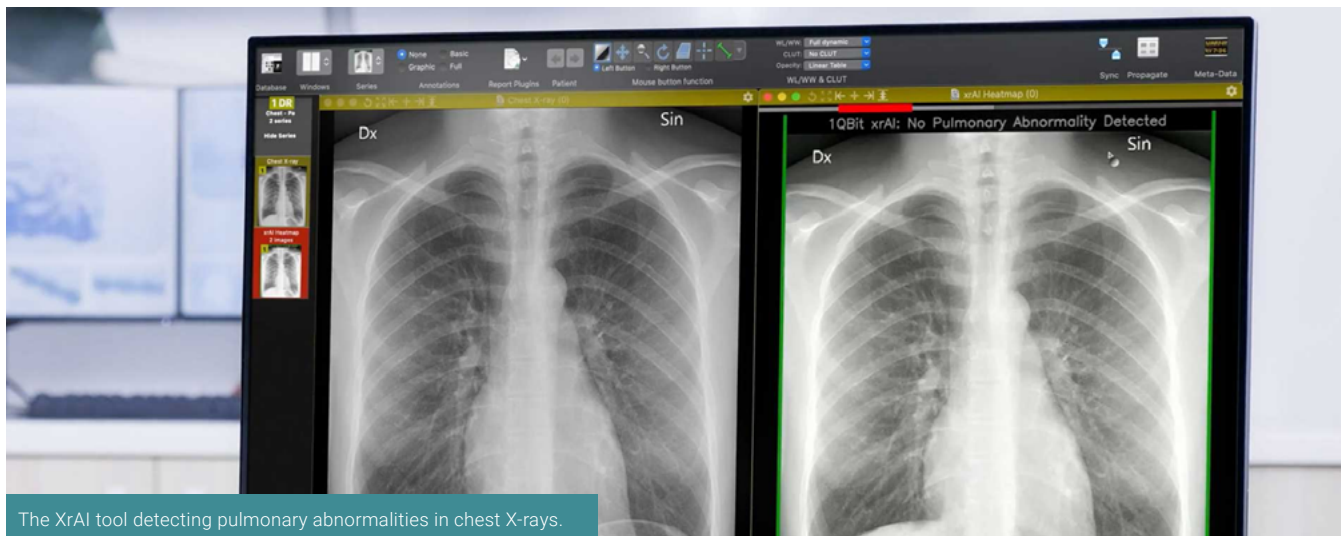
New funding and partnerships have enabled 1Qbit to accelerate the clinical deployment of XrAI, a project leveraging artificial intelligence-based radiology used in the fight against COVID-19.

Recently certified as a Class III Medical Device by Health Canada, **XrAI** identifies lung abnormalities on chest x-rays in real-time, allowing clinicians in emergency rooms and rural hospitals to better diagnose COVID-19 and other illnesses such as pneumonia, tuberculosis and lung cancer.

"The trust that 1QBit's tool has garnered as a result of its rigorous approach is what I believe has led to such a prompt and positive response from the medical community," says Dr. Paul Babyn, Physician Executive of the Saskatchewan Health Authority, which conducted its clinical trial for XrAI much sooner than originally planned.

Through its COVID-19 program, the Digital Technology Supercluster is helping healthcare authorities to implement XrAI in hospitals and clinics in B.C., Saskatchewan and Ontario. With XrAI seeking certification from the U.S. Food and Drug Administration, 1QBit is set to add to its team of more than 120 mathematicians, computer scientists, physicists, chemists, software developers, physicians, biomedical experts and quantum computing specialists.

"Deploying the tool in Canada shows that we can replicate it across different global markets," Oberoi says. "This is opening up opportunities we might not have without the support from the Digital Technology Supercluster."



The XrAI tool detecting pulmonary abnormalities in chest X-rays.

DNASTACK

## BREAKING DOWN SILOS TO SOLVE COVID-19

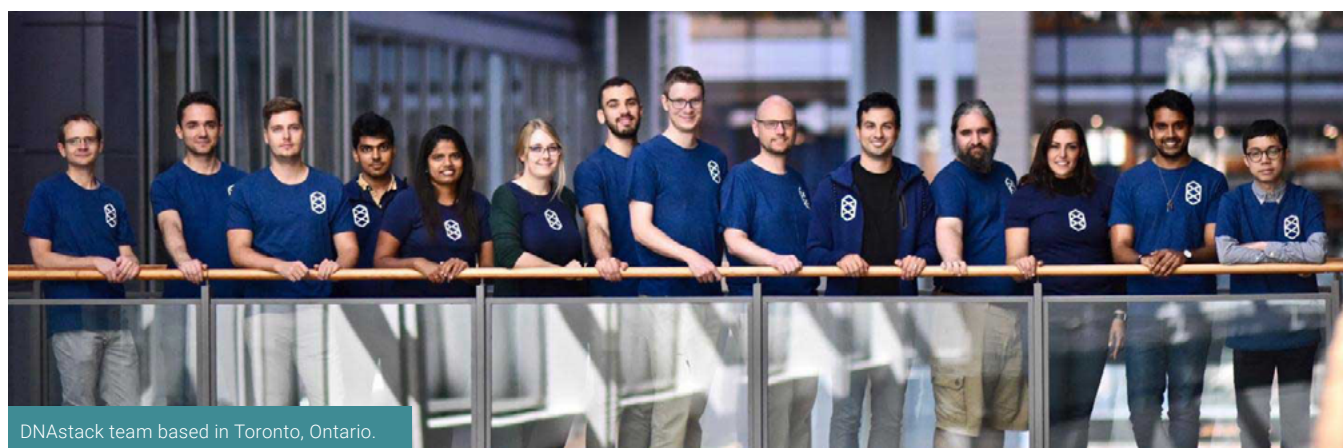


Toronto-based DNASTack received widespread attention and interest when the Prime Minister of Canada highlighted the Digital Technology Supercluster's COVID-19 Program during a televised address in April.

"DNASTack is developing a new cloud-based network that allows researchers who are looking to improve our ability to diagnose and treat COVID-19 to share their findings," Justin Trudeau explained, referring to the new [Beacon – Realtime Global Data Sharing Network](#) project, also referred to as COVID Cloud.

Led by DNASTack in collaboration with Microsoft, the team is working to significantly improve health outcomes for all Canadians. Using the Secure Health and Genomic Platform, a patient's medical data, including genetic information, can be securely consolidated to determine how to best respond to treatment.

"The opportunity to work with Microsoft and other partners, combined with access to Supercluster support and funding, align perfectly with our core business and product roadmap," says DNASTack CEO and co-founder Marc Fiume. Since joining the Digital Technology Supercluster, DNASTack's team has doubled in size, with Fiume expecting a 50 per cent jump in company revenue in 2020. "Now we're getting interest from people in markets like Europe because we're working to improve access to biomedical data sets scattered around the world."



DNASTack team based in Toronto, Ontario.



IMPACT **STORIES**

## PROTECTING OUR PLANET: **COLLABORATION IS KEY**

The resource sector contributes 17 per cent of Canada's GDP, and with satellite imagery becoming increasingly relevant, it's no wonder that the Earth Data Store project has the potential to strengthen the industry and our economy with data insights.

The project is led by UrtheCast in collaboration with Sparkgeo, Microsoft, UBC, the University of Victoria (UVic) and Geoscience BC. The group is enabling unparalleled access to complex geospatial and earth observation data from satellite imagery by using algorithms to aggregate, analyze and display this data on interactive maps to reveal how regions evolve over time.

"The key with this project is that you don't have to be a highly specialized data scientist to use the system," says UVic professor Yvonne Coady. "You don't have to dig into every instrument on the ground or in the sky to use this tool to evaluate policies, make timely decisions and manage resources."

According to William Parkinson, Technical Product Manager of software engineering at UrtheCast, the platform "will provide unique capabilities to guide city growth, environmental sustainability and respond to disasters such as forest fires and floods."

By identifying factors such as population densities, roads under construction, and parks and public areas that need servicing, Parkinson explains these tools can examine historical trends and current patterns, determine where Canada is at risk, and identify mitigation strategies. Likewise, the platform can show how to best irrigate vegetation to avoid water waste and where new sustainable urban areas can be built in harmony with the environment.



CARETEAM

## PROVIDING THE RIGHT TECH AT THE RIGHT TIME



As the lead organization in the **Rapid Deployment of Emergency Case Management project**, Careteam's 15-member team is working with three other companies to provide in-home monitoring, virtual care and rapid referrals to Canadians with pre-existing conditions who are at increased risk due to COVID-19.

As well as providing funding to hire staff and expand R&D, the Digital Technology Supercluster "is an opportunity for us to get involved in projects that are much more ambitious than what we can do on our own," says CEO & Chief Medical Officer Dr. Alexandra T. Greenhill. "It is a way for a small company like ours to be connected to global players, develop solutions that are meaningful, and leverage the full value of the innovation we have created."

At the same time, the Supercluster is helping Careteam attract funding and form new partnerships with heavy hitters such as U.S.-based Change Healthcare. "We have global ambitions, and the Supercluster positions us as a strong Canadian partner," Greenhill says. "It boosts the credibility of smaller companies and allows us to be a leader in the global market a lot faster."





# PIONEERING OUR FUTURE



The Digital Technology Supercluster brings together the brightest minds and leading names in health, natural resources, communication, transportation and tech to develop solutions that will fuel our global economy.

Canadians have fought hard to tackle COVID-19. Through the last two years and accelerated by COVID-19, we can see clearly the benefits and impact of digital technologies – across every sector and especially when it comes to powering Canada's economic recovery and renewal.

## BUT WHY STOP THERE?

We have a global opportunity to build on the momentum gained this year to help create a safer, more sustainable world. From individual organizations to entire industries and all levels of government, we need to courageously embrace the power of innovative collaboration to develop, deploy, and scale Canadian-made technologies.

**Together, we can unlock Canada's potential to build a brighter future.**



Left to Right: Graham Cunliffe, (Present) Client Solutions at Unity Technologies (Former) Chief Strategy Officer of the Finger Food Advanced Technology Group; Sue Paish, CEO of the Digital Technology Supercluster; The Honourable Bruce Ralston, Minister of Energy, Mines, and Petroleum Resources; The Honourable Navdeep Bains, Minister of Innovation, Science and Industry; Karn Manhas, CEO of Terramera; Kory Wilson, BCIT Executive Director, Indigenous Initiatives and Partnerships.