DIGITAL
TECHNOLOGY SUPERCLUSTER

CASE STUDY

DNASTACK

Propelling Worldwide Collaborative Genomics Research for COVID-19

The Company

DNAstack is a Toronto-based biomedical data-sharing company that creates software to accelerate breakthroughs in genetic research and precision medicine. The Company develops standards and technologies for scientists to more efficiently find, access, and analyze the world's exponentially growing volumes of genomic and biomedical data. DNAstack's mission is to improve the lives of millions of people by breaking down barriers to data sharing and discovery.

The Problem

COVID-19 has radically changed our world, and the impact of the virus will be seen for years to come. With our healthcare system strained and the global death count continuing to climb, solutions that can help Canada and the rest of the world respond to ongoing challenges of the pandemic are urgently needed. Variants such as Omicron continue to emerge regularly and spread rapidly. Understanding the genetic footprint of the evolving virus is essential if we are to predict and manage these variants—and save lives.

3X

CanCOGeN

Global Alliance
for Genomics & Health

+ **Tripled company size and revenues**

+ **Product adopted by a consortium of Canadian federal, provincial and regional public health authorities and healthcare partners led by Genome Canada**

+ **European international expansion**

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The COVID Cloud (Viral AI) Solution

COVID Cloud, led by DNAstack, is a major Canadian contribution to this life-saving work. The digital technology platform, recently renamed Viral AI, brings together massive volumes of data, including genomic, epidemiological and other data critical to pandemic response from around the world, which scientists can then access easily and securely. Equipped with this information, they are able to rapidly sequence, share and analyze SARS-CoV-2 variants, as well as monitor transmission patterns, mutation rates and where within the genome the virus is mutating, which is important for developing vaccines and drug targets. Immunology experts, healthcare professionals and decision-makers can then use this vital knowledge to inform their development of diagnostics, therapies, vaccines and public health policies.

Viral AI is at the centre of Canada's pandemic response. The end-to-end software solution is unlocking insights about COVID-19 from genomics and other data in real-time, making these findings available to researchers and decision-makers around the world. The platform quickly became a foundational element for two organizations in Canada. The Government of Ontario uses Viral AI to support real-time analysis and decision-making regarding COVID-19 and its variants in Ontario and around the world. The Canadian COVID-19 Genomics Network (CanCOGeN), a consortium of Canadian federal, provincial and regional public health authorities and healthcare partners led by Genome Canada, relies on the platform to help share viral sequence data with Canadian researchers, powering their insights about the virus in the context of human health.

The COVID Cloud project brings together Canadian expertise in several areas—from software engineering, artificial intelligence and cloud computing, to genome science and virology, to pharmaceutical development. Consortium members include Microsoft, Roche Canada, BioSymetrics, Mannin Research, FACIT, Genome British Columbia, Ontario Genomics, Ontario Institute for Cancer Research, Sunnybrook Health Resources Centre, Vector Institute, and Centre of Genomics Policy at McMaster University.

Measurable Results

Viral AI is advancing Canada's digital advantage by showcasing our world-class genomics research. Canada has an immense quantity and range of scientific talent, being supported by a thriving digital innovation ecosystem. The strategic partnerships and customer relationships that were formed through the COVID Cloud project exemplify the importance of this ecosystem, bringing together people to collaborate and build solutions better and faster than ever before.

The COVID Cloud project has also helped put Canada and DNAstack on the world stage as a trusted leader in secure data sharing and dissemination. Sharing genomics and biomedical information over a cloud-based global network, while adhering to the highest industry standards of data privacy, has improved global knowledge at a speed and scale that would not otherwise be possible. Through this platform, diagnostics, treatment and government policy decisions around lockdowns and things that impact citizens can be delivered in a timely, data-driven way.

For DNAstack, investment from the Digital Technology Supercluster helped them scale quickly and sustainably – reaching product maturity in months versus years. The collaboration and co-investment model of the Supercluster enabled DNAstack to build a world-class consortium that shared a common vision to accelerate genomic medicine discoveries. This included members and strategic connections from the public sector, government and academia.

DNAstack continues to grow and build on their success. Since joining the Digital Supercluster, DNAstack has tripled in size and revenues, and the product visibility and validation they are getting has helped them attract investment and partnership interest which will carry them through this next phase of their growth. They recently entered into a global partnership with the Global Alliance for Genomics and Health, generating new interest from the European market.

DNAstack is taking advantage of the COVID Cloud project to explore new diagnostics and therapeutics for severe COVID-19 cases. They have also used the technology to create the Autism Sharing Initiative— the first federated, global network for sharing genomics and clinical data to accelerate discoveries and development of precision therapeutics in autism.

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It was astonishing to see how many partners throughout Canada stepped up and rallied in support of this common vision. Our country has so much talent – in AI, genomic medicine and policy. What's so special about the Supercluster is that it enables us to build world-class consortiums and scale quickly in a way that hasn't been done before."

MARC FIUME, CEO OF DNASTACK.

Learn more about the COVID Cloud Project at: digitalsupercluster.ca/projects/covid-cloud/