

Canada wide. Global impact.



STRATEGIC PLAN 2018-2023

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Canada's Digital Technology
Supercluster Business Plan
2018-2023.

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Printing Date

March 5th, 2019

Version 1.0.

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A journey began over a year ago when some British Columbians asked:

“ What do we see as the future social and economic opportunity for British Columbia and Canada over the next 20 years?

From that small gathering grew dozens of roundtable discussions, townhall sessions, collaborations and partnerships that have unfolded through to today. It has involved hundreds, if not thousands, of people. Entrepreneurship, a pioneering spirit, a commitment to the future we are building for Canada and a deep sense of community all fuelled this collaboration.

“

It's a remarkable opportunity to forge a new model of partnership and collaboration as we make a bold leap into the future. Together with the support of our many partners, we look forward to unlocking the incredible potential of BC creators to grow our economy and build a thriving, world-class hub for innovation in digital technologies, data analytics, mixed/augmented virtual reality and quantum computing.

- **Sue Paish,**

Inaugural CEO, Canada's Digital Technology Supercluster, May 2018





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Executive Summary

Canada's Digital Technology Supercluster (“the Supercluster”) will position Canada as a global leader in digital innovation and unlock the potential of data to transform our economies and secure economic success and social wellbeing for Canadians.


The Supercluster is an industry-led consortium based in Vancouver, British Columbia. The organization brings together small, medium-sized and large companies, research organizations, post-secondary institutions and not-for-profit organizations. We are one of five Superclusters across Canada established in 2018 and supported by the Government of Canada's Innovation Superclusters Initiative, along with public and private co-investors which make up our membership.

This initial five-year plan outlines our vision for Canada to be a world leader in digital innovation, and the role and strategies of our Supercluster to fuel economic opportunities and deliver benefits to Canadians.

The Supercluster will build upon Canada and BC's strengths to create a critical mass of world-leading digitally intelligent companies across BC and Canada that develop innovative products, platforms, and processes. The Supercluster will transform Canadian industries through the digitization of business and prioritization of industry specific needs. The result will be productivity gains and competitive advantages at the firm and industry levels.

Our investments are aimed at creating digital solutions that can be extended across multiple industries including natural resources, healthcare and industrial sectors. This will create products, processes, platforms and companies that will drive new commercial opportunities and provide access to untapped markets. Our investment in technology development will integrate the development of a diverse and skilled workforce to support the scaling of small and medium enterprises and a robust innovation ecosystem. We have already secured investment commitments of over \$360 million which in turn will boost the national GDP by over \$5 billion and support the creation of 13,500 jobs over the next decade.

Our unique partnership model integrates world leading research with industry-driven technology development, ultimately providing a strong foundation for building and training a highly skilled and diverse talent base. Our investments will be made through Technology Leadership programs in the three streams: Digital Twins, Data Commons and Precision Health will be complemented by direct investments in talent development through our Capacity Building program. We intend to invest in projects that will accelerate the growth of a robust innovation



ecosystem, expand the base of digitally skilled talent and support the scaling and growth of small and medium enterprises.

Our targeted investments across Canada's sectors of strength in natural resources, healthcare and industrial sectors are aimed at providing solutions and creating pathways to global leadership. By 2023, our investments will create new products, processes, platforms and companies that will enhance Canada's global competitiveness, drive new commercial opportunities and create access to new markets. Most importantly, our activities will contribute to the development of a high performing ecosystem, with a diverse, well trained workforce at its core, prepared for future opportunities to ensure social and economic benefits for Canadians.



1

Innovation Leadership for the Digital Economy

If the prize resource of the 20th century was oil, then the prize resource of the 21st century is data. The mastery of data now promises to be as transformative to society as was the mastery of oil in the last century.

The driver for this global transformation of economies and societies is a convergence of fields such as science, engineering, and computation, together with technological advancement that is unprecedented in its speed, scale, scope, complexity and potential impact on humankind.

Imagine the opportunities when every person on the planet has mobile connectivity with unlimited access, storage and processing of data and information. Add to this, advances in disruptive technologies such as: nanotechnology, genomics, 3-D printing, virtualization, material sciences, Internet of Things, artificial intelligence, robotics, energy storage, and quantum computing. These advances and opportunities will fundamentally change how we live, work and interact.

Companies have a name for the successful command of this resource: digitization of the enterprise. Also referenced as digital transformation, it is a phrase ubiquitous in shareholder speeches, executive suites, and venture pitches around the world. However, with growing amounts of data coming from ever-more sources at an increasing velocity, mastery is a tall order.



2

Canada's Digital Technology Supercluster

Mastery of innovation is bigger than any one individual enterprise. Successful innovations need a supportive policy environment, customers willing to adopt new products and technologies, industries willing to develop leading edge products and services, research institutions supporting emerging technologies, talent who are trained and ready - and so much more. It takes a concerted effort to align research and development resources across industry, government, non-profits, universities and colleges: often referred to collectively as an 'innovation ecosystem'. Countries that lead the world in innovation have learned to build collaborative, large scale R&D initiatives that harness the collective strengths of their innovation ecosystems and give them structural, meaningful advantages when competing in the global marketplace for money, talent and market access.

In response to the need to strengthen Canada's collaborative R&D capacity and global competitiveness, the Government of Canada's [Innovation Superclusters Initiative](#) is a significant commitment to a new model for innovation. It aims to provide opportunities for innovators and potential customers to harness the strengths of their local ecosystems, to work closely together on the research, to engage in development and demonstration activities that will lead to major commercial opportunities and boost productivity across industries create jobs and drive economic growth.

The Supercluster is one of the five, independent, national, industry-led innovation consortiums announced in 2018. The Supercluster is focused on co-investing in ambitious technology development projects and propelling the growth of a robust innovation ecosystem. Approved for an initial five years, the Supercluster was founded on the following vision, mission and values.

2.1 *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.

2.2 *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.



2.3 *Our Charter of Values*

The Supercluster is guided by core values that are the cornerstone of how Supercluster Members, Participants, staff and stakeholders interact and work together.

DIVERSITY. We embrace diversity and inclusion in everything we do;

TRANSPARENCY. We are transparent, open, candid, and respectful in our communications and actions, and we promote a trustful environment;

COLLABORATIVE. We proactively collaborate, respecting and leveraging the value of different experiences and perspectives to drive agreement;

RESULTS FOCUSED. We are outcome and results focused, knowing that through collaboration we will deliver meaningful, strong and positive results;

GREATER-GOOD. We embrace the greater good and seek system-wide benefits;

BOLD. We are dynamic and innovative, pushing technology for maximum business and societal impact; and,

RESPECT. We keep our promises and if there are conflicts, we declare them to maintain transparency and professional integrity.

2.4 *A Commitment to Diversity and Inclusion*

Our Supercluster understands and embraces the benefits, strength and power of diversity and inclusion. In every element of our governance, operations, membership, management systems and in the development of our projects, we are committed to leveraging the benefits of diversity and inclusion. Through all stages of planning, design, strategy, and project development, the Supercluster will prioritize diversity and inclusiveness. For example, programs will be designed and managed to optimize equitable access to, and participation from, a diverse pool of interdisciplinary talent. We will also benchmark our performance relative to our commitment to diversity and inclusion and regularly assess our progress.

As we execute on our innovation activities, we will increase the demographic diversity of our staff, stakeholders and beneficiaries by enabling the inclusion of under-represented demographic groups including women, Indigenous citizens and Canadians from rural and remote communities. The Supercluster will continue to connect with global leaders in diversity and inclusion including the European Union, [UN Women](#), and the [WE EMPOWER](#) Programs.

2.5 Benefits to Canadians

The Supercluster's five-year plan is based on maximizing opportunities through explicit sector specific strategies that identify real world challenges that can be addressed through R&D. Our programs and activities are designed to achieve success on technology R&D projects and optimize a robust innovation ecosystem.

Our plan aims to generate over \$5 billion in incremental GDP and create 13,500 jobs over the next ten years. The anticipated benefits and impact are outlined in Figure 1.



Figure 1. Benefits to Canadians



2.6 Our approach

Our approach consists of matching industry needs to the capabilities in our advanced digital technology sector. In doing so, we have designed collaboration and customer adoption into our supercluster strategy from the outset, ensuring that technology development resulting from our approved projects will ‘move the needle’ in respect to productivity and competitiveness for Canada’s companies. The result will be faster commercialization and export of products, platforms, and technologies that will simultaneously cultivate global leaders in digital technology and enhance the performance, competitiveness, and productivity of Canada’s companies in key sectors of the economy.

The international evidence is unambiguous – to be successful the Supercluster needs to be ambitious, bold and enterprising. Our approach to delivering on the potential for economic growth and public good benefits will be focused on delivering: strong interconnected regional innovation ecosystems; strong R&D partnerships; excellent digital technology platforms and projects; a high quality technology portfolio; and, digitally skilled talent for entrepreneurship and scaling companies.

Core activities of our Supercluster include:

- Facilitating cross-sectoral and interdisciplinary engagement, outreach and collaboration among Supercluster Members and participants across the innovation ecosystem
- De-risking innovation and helping firms, of all sizes, to go beyond their existing capabilities and what they can achieve with their own resources
- Designing programs and aligning resources in priority areas of need and opportunities
- Providing thought leadership in technology design, IP management and data strategies (e.g., data access and participation frameworks, etc.)
- Enabling knowledge, resources, IP and skills to flow between businesses and institutions with speed and intensity
- Developing a pipeline of opportunities through defined programs and co- investing in relevant, impactful projects with quality consortia
- Managing the project portfolio actively using best practices, reporting and measurement tools
- Building capacity in the ecosystem for developing talent and scaling companies
- Taking collective action through our IP and Data Strategies to create positive vehicles for growth while employing global best practices



2.7 Building on BC's Strength

British Columbia is home to over 10,000 technology companies and is the fastest-growing technology sector in Canada². BC is also Canada's #1 start-up ecosystem and #15 globally³. Top-quality talent is critical to securing the success of the sector and to continuing to grow a resilient, robust innovation ecosystem.

Our Supercluster is founded on the world class digital capabilities in BC. With over 500 organizations interested in working with us, including large and small companies, BC's post-secondary institutions, leading universities and research institutes, and government, we have the momentum necessary to build a world-class supercluster. Our Supercluster includes over a dozen large corporate adopters including Teck Resources, Providence Healthcare, Canfor, Avcorp, TimberWest, Microsoft, LifeLabs, Boeing, the Province of British Columbia, and TELUS - significant brands that can lead the adoption and success of new products and technologies.

Our Supercluster will capitalize on distinct advantages in our region including our:

- Global leadership in virtual, mixed, and augmented reality
- Global leadership in data analytics and quantum computing
- Global leadership in genomics, a cornerstone for precision health
- World class research capabilities
- Proximity to world's largest cloud computing epicentre in Cascadia
- World-class creative and digital media talent and other centres of excellence (e.g., connectivity and IoT)
- Strong connections to First Nations communities and strong principles of diversity and inclusion

The digital technology space is unrivaled in terms of projected future growth. Many of its most promising components—such as virtual, mixed and augmented reality (VR/MR/AR), quantum computing, cloud computing and IoT—are expected to witness triple digit market growth in the years ahead. For example, the global VR/MR/AR market—currently a small segment of the digital technology space—will generate US\$11.4 billion in sales in 2017, and by 2021, global sales are forecast to hit as much as US\$215 billion, a twenty-fold increase.⁴ Put another way, in just four years this segment of digital technology will go from being smaller than BC's forestry sector to twice as big as Canada's oil and gas industry, or bigger than the entire BC economy.^{5,6}

² https://wearebctech.com/wp-content/uploads/2018/11/2018-BC-technology-report-card_FY18_FINAL_14-Nov.pdf

³ http://www.vancouvereconomic.com/blog/vecs_take/vancouver-canadas-1-startup-ecosystem/

⁴ IDC. Worldwide Semiannual Augmented and Virtual Reality Spending Guide. 2017.

Based on forestry data from the CPABC [Updated: Overview of the BC Forestry Industry]. Assumes crude prices of US\$60 and natural gas prices of US\$2/GJ at 2016 production levels.

⁵ BC's GDP in 2016 was roughly C\$264 billion, or US\$207 billion based on a CAD/USD of exchange rate of 1.27.

⁶ <https://www2.gov.bc.ca/gov/content/data/statistics/economy/bc-economic-accounts-gdp>



Similarly, consider the profound growth of data in business and society in recent years. More data has been created in the past two years than in the entire previous history of the human race. Moving forward, the global data inventory will quadruple by 2025 and worldwide revenues for big data and analytics are expected to exceed \$200 billion in 2020. This is driven by business leaders transitioning their companies into insights-driven, data rich organizations. We're at the inflection point of unprecedented, enormous opportunity. Our digital technology Supercluster has been designed to capitalize on these important trends.

Galvanized by the Government of Canada's Innovation Superclusters Initiative, aligned behind a global vision, and inspired by an ambitious strategy, we have targeted leading companies in the health, natural resources, and industrial sectors to support their digital transformations. We have engaged organizations across the spectrum of start-ups, small and medium enterprises (SMEs), large companies, multi-nationals (MNEs), large industry adopters, post-secondary institutions, and research institutions. Our Supercluster creates the environment where these organizations can address digital challenges and capture opportunities resulting from the digitization of society by collaborating to create products and platforms that can lead the world.

2.8 The Digital Technology Landscape and Canada's Opportunity

Technology research and development collaborations allow firms to pursue ambitious projects through shared ideation, planning, development, market research, customer engagement, implementation, and investment ultimately accelerating the pace of successful innovation. This shared innovation model aims to enhance access to global customers, supply chains, and infrastructure thus contributing to the development of a robust innovation ecosystem and opportunities to develop talent, diversity and capacity in the technology ecosystem.

The Supercluster is initially focused on digital technology opportunities in the natural resources, human health, and industrial sectors, recognizing the strength of these industry sectors in BC. Over time, it is expected we will extend the program to other industry sectors, applying key platform technologies, products, and processes to well-defined industrial challenges and market opportunities in each.

Our program framework is based on innovations in data collection, data analytics and data visualization applied to Canada's leading sectors, and in talent development and capabilities to support a resilient ecosystem (Figure 2). We intend to leverage emerging trends in advanced digital technology to turn increasingly vast data into valuable insights to drive competitive advantage.

At the data collection level, Vancouver boasts an impressive list of companies that have developed Industrial Internet of Things (IIoT), wireless and broadband solutions that serve global markets and multiple industry sectors.

At the data analysis level, we will leverage BC’s reputation in business intelligence, data analytics and our leadership in quantum computing. We will also leverage our connections within the Cascadia Innovation Corridor to build a growing ecosystem of software companies in cloud computing, machine learning, artificial intelligence and visual analytics while enhancing our relationships across and leadership in the Cascadia Corridor.

Data visualization represents one of the greatest opportunities for the Supercluster. As a result of the region’s thriving movie and gaming industries we have an enviable talent pool of 3D artists, animators, developers, and user experience designers. This reputation has catapulted Vancouver as the leading jurisdiction for 3D artistry, 3D special effects, and 3D games. Skills developed and honed in the gaming and entertainment sectors are transferrable across multiple other sectors and will further our leadership in the emerging categories of augmented, mixed and virtual reality.

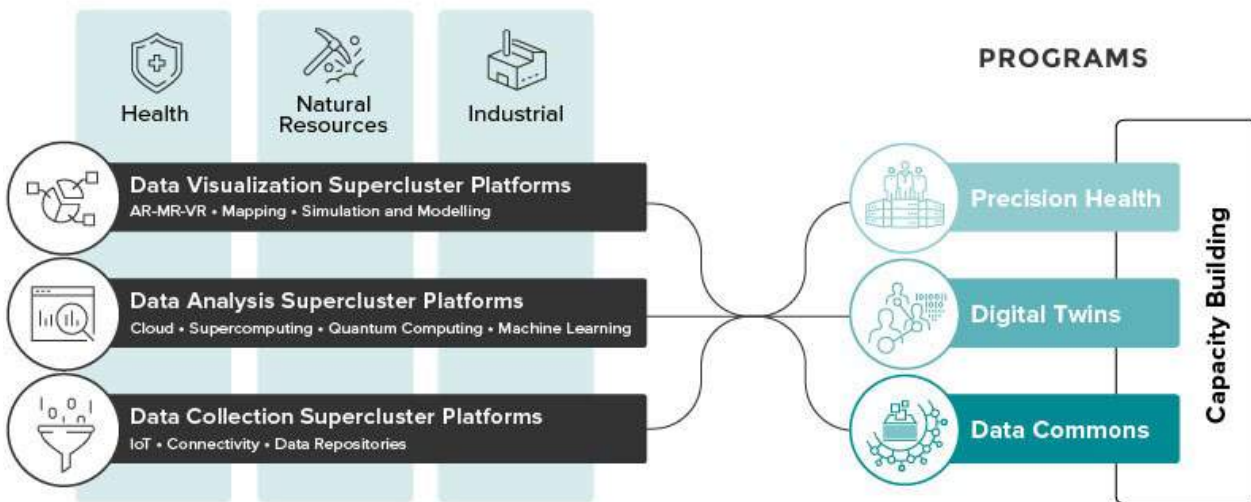



Figure 2. Program Framework

2.8.1 Areas of Focus

In the Digital Transformation report from the World Economic Forum, “to succeed in the digital era, (companies) will need to become digital enterprises, rethinking every aspect of their businesses.”⁷ This ‘Fourth Industrial Revolution’ is inspiring and demanding new approaches to product development, collaborative innovation and organizational forms, as businesses become more customer-centric and as customers demand, provide and control more and more data organizations who have the talent, platforms, products and tools to manage, analyze and leverage data for and on behalf

⁷ www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/



of their customers will lead in the global marketplace. Our Supercluster aims to create the opportunities for Canadian organizations to be global leaders. We are initially focused on three sectors: natural resources, industrial and healthcare.



Natural Resources

Canada's resource economy contributes 17% to GDP (direct and indirect). In terms of direct contribution to GDP, the energy sector and minerals and metals contribute 6.9% and 3.9%, respectively. In 2017, natural resources directly and indirectly accounted for 1.8 million jobs in Canada.⁸

Digital technologies can ensure healthy and productive forests in the face of a changing climate. Digital technologies can help improve forest management policies and practices, mitigate against wildfires, develop pest and pathogen detection and mitigation strategies, and enhance the monitoring of tree and ecosystem health. Digital technology can improve productivity, cost efficiencies, product quality, sustainability, agility and responsiveness to market needs and may lead to new approaches and business models and empower a future workforce. In short, digital technologies can underpin the transformation of Canada's resource sectors and provide economic opportunity, talent development and global leadership. Despite this potential, a survey estimated that only 5% of forest sector employees felt they were well prepared to make the necessary changes in leadership and management practices. Across industries, that figure is 30%.⁹

The mining sector is also facing global pressures, with an even longer time frame for realizing the benefits of investment in discovering and developing asset and continued market volatility.

Canada is recognized for global leadership in exploration and implementing innovation. Industry is starting to apply artificial intelligence in exploration and system-wide digital technologies to improve productivity, performance and decision-making. The imperative is clear for mining companies to integrate digital technologies to improve safety and production through increased connectivity and real time data from the pit to the boardroom. Even at the mine design stage, the benefits of digital technologies are clear with an estimate that "over the next 3 years, 38% of mining companies will be investing in virtual simulation software and artificial intelligence systems."¹⁰ The digitization of our mining sector has the potential to deliver streamlined operations, cost efficiencies, talent development and enhanced global competitiveness.

⁸ https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/files/pdf/10_key_facts_NatResources_2018_e.pdf

⁹ <https://www.accenture.com/us-en/blogs/blogs-forest-products-tracking-digital-transformation>

¹⁰ <https://london.minesandtechnology.com/virtual-simulation-artificial-intelligence/>



Industrial Sector

The future “smart factory” brings together traditional manufacturing and industrial practices with the technological world. Industrial firms risk becoming obsolete in a globally competitive and rapidly changing digital economy. The imperative for firms is clear: employ digital strategies that integrate advanced analytics, machine learning, the IoT, cloud computing and human-machine interfaces for improved and faster product development, optimized use of equipment, reduced operational footprints and improved customer satisfaction. The need to access, manage, analyze and leverage data in real time to inform decision making for existing operations must be leveraged for innovative business models.



Healthcare Sector

Precision health is an opportunity for a new paradigm of healthcare as digital technologies and genomic data increasingly inform patient care from prevention, diagnosis, through to treatment and recovery. In addition to improved health outcomes, there will also be improved healthcare efficiency: in BC and globally, healthcare systems are facing onerous costs (>50% of the overall BC budget in 2019).¹¹ From the Internet of Medical Things to electronic medical records, analytics are converging to deliver precision health that can improve Canadian health outcomes by creating new opportunities from tailored pharmaceuticals, remote monitoring of health status, and personalized patient services. At the same time, finding the right balance between accessing health data and managing privacy is critical and presents another opportunity for digital technologies combined with Canadian expertise to lead the world. Health sector organizations that digitally transform will create value, be globally competitive, attract and retain the best talent and contribute to the transformation of our healthcare system from a 'cost centre' to a positive contributor to our economic success. The life sciences sector alone is a new market estimated to be worth \$100 billion.

2.9 Strategic Approach

Increasingly, digital technologies are equipping a range of Canadian industries – agriculture & forestry, fisheries & aquaculture, energy & mining, manufacturing, transportation and health, among others – with a highly skilled workforce coupled with cutting-edge tools and technologies. This is driving growth, productivity, commercialization and global competitiveness, while finding solutions to key social and environmental challenges.

To focus and mobilize the breadth and depth of the opportunity, we have developed an approach that helps define our membership's collective priorities and highlights

¹¹ Budget 2019. Ministry of Health (\$19.7M), Ministry of Mental Health and Addiction (\$10M).



a path forward based on 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”.

We support industry-driven research and the development of digital innovations that will support the transformation of our industries and drive us to global leadership. Our value proposition is based on a strategy that is positioned to meet industry needs, while bringing together our digital innovators and world class research capabilities. We actively foster the interactions that will support the development of globally competitive proposals and areas for investment where there are gaps, opportunities and needs to support a future digital economy.

Our project portfolio is managed by our Supercluster team to meet milestones and deliverables with respect to both digital innovation and developing products, platforms and services. The organization is well positioned to exploit opportunities within our programs.

Supercluster projects are consortium-based. Membership in the consortium is open to any organization interested in data-driven innovation and digital transformation. That means large companies, small companies, researchers, government ministries and post-secondary institutions can, and have, joined. By not focusing on a single industry or sector, we create a unique, collaborative space in which organizations that may not normally engage can discover common goals and shared strategic interests. By promoting collaboration among a broad base of participants, we can capitalize on the assets and capabilities that are ultimately developed across each of the data platforms to power future collaborations.

Our approach, in consultation with ecosystem stakeholders, is designed to advance collective priorities, address common challenges which includes the ability to:

- Leverage the existing investments into research and innovation capabilities of the region, including:
 - Federal Network Centres of Excellence
 - Strategic Federal investments into digital, health, natural resources (cleantech) and manufacturing in the Supercluster region
 - Provincial Programs and Crown Corporations
 - Accelerators and Incubators
 - Not-For-Profits and Research & Technology Organizations
 - Universities and Colleges
- Translate and valorize scientific discoveries into products and services that can used domestically and exported globally

- Accelerate the commercialization and growth of BC's small businesses by connecting them to customers, partners, Investors and market opportunities including:
 - the main corporate R&D spenders in the region,^{14,15}
 - Health & life sciences
 - Information and Communication Technologies
 - Natural resources
 - Manufacturing & transportation
 - the main adopters of technology, digital services, machinery and equipment
 - sources of financing and growth capital
 - venture capital
 - angels
 - private equity
 - junior public markets (TSX-V)
- Maximise the potential for spillover benefits between traditionally siloed organizations and industries
- Protect, expand and create role and job opportunities for Canadians
- Uncover the unique challenges and gaps in the ecosystem that if solved, could have multiplicative and multifactor benefits across organizations and industry sectors

The articulation of challenges and opportunities has implications for our Supercluster in that we will:

- 1** Act as a trusted facilitator and provide thought leadership and insights for government, researchers, industry and the public.
- 2** Be explicit in our diversity and inclusion values in the design, development and execution of our programs, projects and underlying activities through proactive engagement and outreach with other organizations in the development of talent and in the equitable participation and benefits.
- 3** Proactively forge cross-sectoral and interdisciplinary interactions in the innovation ecosystem to ensure a pipeline of projects to support a high quality technology portfolio.
- 4** Generate benefits for Canadians arising from industrial support which may include commercial outcomes and may also include additional benefits arising from open sources of data and IP, new data and IP sharing frameworks, better decision making, better policies and regulations and a positive business environment.

¹⁴ BC Business Top 100. 2018

¹⁵ Research Infosource. 2017



3 Strategic Objectives

Our strategy will supercharge BC and Canada’s vibrant digital technology ecosystem, transforming it into a global hub of digital technology and data-related research, development, and commercialization with all the hallmarks of a world-class innovation hub: hyper-connectedness, extraordinary collaboration and inclusion, and a virtuous cycle of innovation, investment activity, and talent attraction that results in accelerated venture creation, scale-ups, and high-paying job creation.

The Supercluster Strategy is implemented around four core objectives:

- Build powerful partnerships and alliances.
- Develop globally-competitive technology platforms and companies.
- Scale up small and medium-sized enterprises and increase ecosystem performance.
- Increase the breadth and diversity of talent ready for a digital economy.

3.1 *Build powerful partnerships and alliances*

The Supercluster will create new growth opportunities by fostering collaborative relationships among a range of digital technology market participants; from start-ups and innovative SMEs to post-secondary institutions and large multinational corporations. Creating these linkages between digital technology research and development and digital technology adopters, will enable Supercluster participants to pursue global business opportunities, productivity improvements, and innovation capacity-building through powerful partnerships and alliances. In this way, we will move Members and other stakeholders in the innovation ecosystem beyond their own individual capabilities, skills and constrained resources. To achieve this, the Supercluster will:

- Facilitate risk sharing on ambitious market driven projects by developing collaborations with a consortium of businesses and research organizations to share in expertise, investment and risk.
- Create collaboration opportunities for technology start-ups, small and medium enterprises (SMEs), government, universities and multi-national enterprises (MNEs) to connect with new and existing customers in sectors of strength to provide digitization solutions.
- Increase access to innovation, research and technology by fostering partnerships between Canada’s post-secondary institutions and industry to expedite the commercialization of research, create work-integrated learning experiences for students and enhance the availability of a skilled, job-ready workforce.
- Develop links with large multinational corporations to improve the connection to global value chains for Canadian digital technology firms.
- Bolster IP knowledge and expertise particularly for SMEs through the delivery of direct programming that can help companies understand how IP can improve their productivity and competitiveness in global markets.



3.2 Develop world-leading technology platforms and companies

The Supercluster will pursue activities that contribute simultaneously to the development of global leaders in digital technology and the enhanced performance, competitiveness, and productivity of Canadian companies in multiple sectors of the economy. To achieve this, the Supercluster will:

- Stimulate the development and commercialization of digitally-driven processes, products, and technologies that target identified industry challenges that exist globally, enabling Canadian companies to capture sales from markets around the world.
- Promote the development of cutting-edge data visualization products and processes – with a special focus on virtual and augmented reality.
- Promote the adoption of digital technology innovation by companies in Canada’s sectors of strength, and improve the competitiveness of Canada’s trading sectors such as mining, forestry, agriculture and industrial manufacturing.
- Develop strategic alliances with other global innovation hubs in North America, Asia, Europe, Africa and South America.
- Increase access to export markets in partnership with the provincial and federal government.

3.3 Scale up small and medium-sized enterprises and increase ecosystem performance

The Supercluster will pursue activities that lead to the scaling up of digital technology companies and enhance ecosystem performance. This includes:

- Favouring technology leadership activities that include collaborative R&D projects, and projects with benefits to multiple firms including SMEs.
- Linking SMEs with large strategic partners and customers through its projects.
- Pursuing supply chain integration efforts with local anchor firms.
- Enabling better access to IP to lower barriers that inhibit collective benefits.
- Creating further economic benefits for SMEs by helping them to scale and develop new market channels for digital technology IP created as a result of collaborations cultivated by Canada's Digital Technology Supercluster.

3.4 Increase the breadth and diversity of talent

The Supercluster will invest in increasing the breadth and depth of our digital talent pool, emphasizing diversity and inclusion as a means of enabling more Canadians to participate in the innovation sector. We will build momentum by increasing co-investment year-over-year in projects and activities that demonstrate significant and



achievable enhancements in labour market diversity and sophistication (see Financials for more details). The Supercluster will:

- Include diversity as a high-priority element in determining Supercluster leadership.
- Promote initiatives to upskill Canadians in traditional industry sectors, creating pathways to new jobs.
- Co-create opportunities with individuals who are part of underrepresented groups, with a particular focus on women and First Nations individuals.
- Work with ecosystem companies to increase and encourage understanding of the positive relationship that exists between increased diversity and company performance.
- Improve awareness among all supercluster organizations of the current best practices regarding inclusion and diversity.

3.5 *Creating Value*

The Supercluster works with its Members to create value across the entirety of the innovation ecosystem. Through a combination of membership development, technology program management, capacity building investments and global outreach and promotion, the Supercluster will serve to build Canadian leadership in digital innovation. The organization's logic model is outlined in Figure 3:

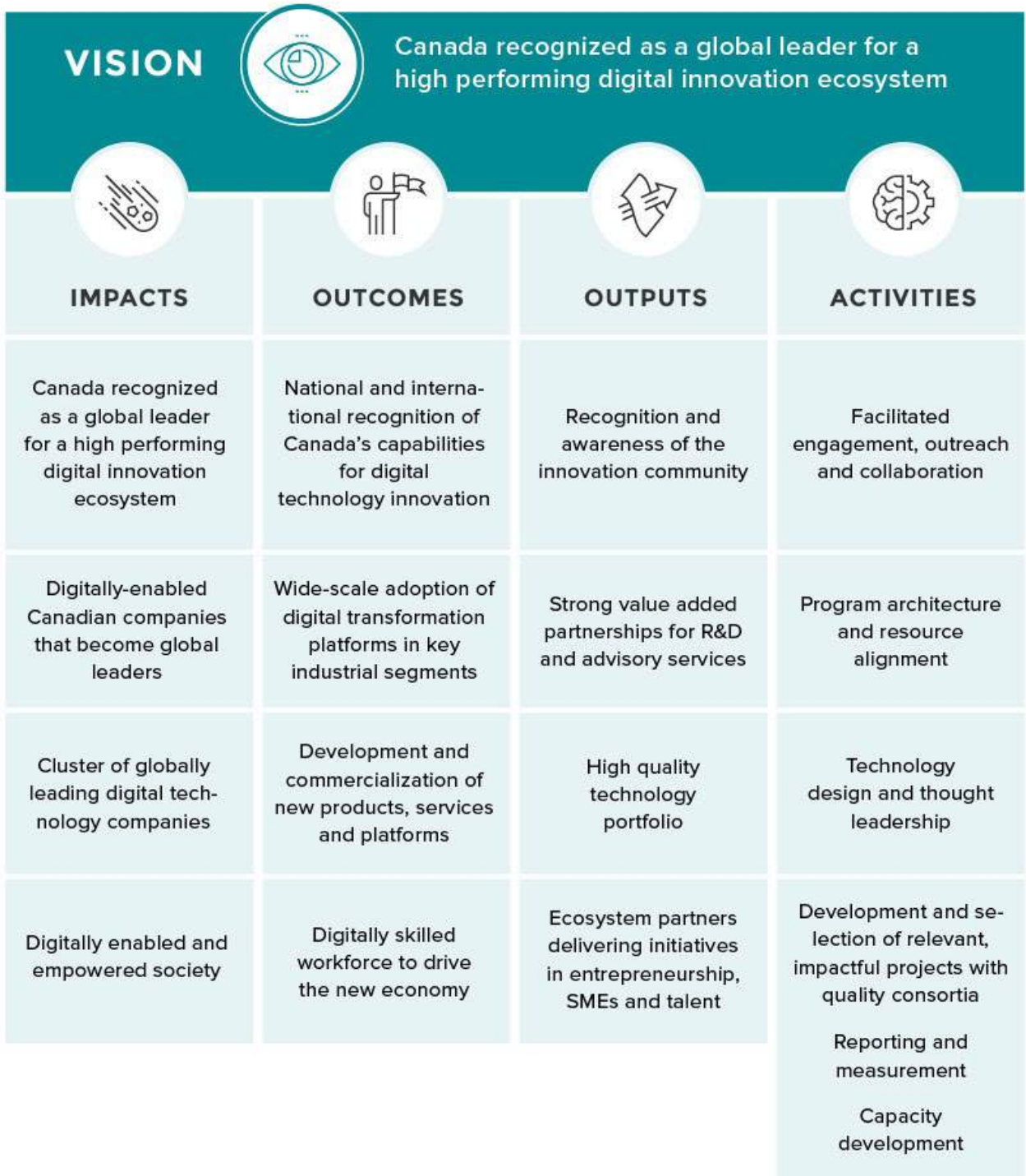


Figure 3. Logic Model



3.6 Key Performance Indicators

An effective system of performance monitoring and evaluation is crucial for ensuring accountability and value for money. It is equally important to provide insights into what works and what does not, with a view to improving and supporting future interactions. Key Performance Indicators (KPIs), aligned with our logic model, will assess the effectiveness of the Supercluster's program strategies and project investments in the context of the objective of building a global leadership position in digital technology and innovation.

In the past, the performance of research and technology centres has often been measured through traditional indicators such as size and volume of R&D or IP registered and licensed. These indicators fail to fully capture the broad and complex role the Supercluster will play in the innovation ecosystem as a catalyst and co-creator. New metrics are needed to measure, for example, the quality of relationships with businesses, universities and markets; convening power; the leverage of resources; and how the Supercluster identifies and manages risk.

As a new organization that is just establishing operational processes for the first time, there is much to learn. Performance indicators of the Supercluster will be related to how well we underpin the linkages within the innovation ecosystem. The initial KPIs, focus on building a diverse membership base from which our collaboration partnerships will evolve; a high potential technology development pipeline; the commercialization of new products and technologies; and, opportunities to broaden the talent base with a focus on diversity and inclusion.

Key performance indicators will include:

- Ecosystem linkages - Number of partnerships and collaborations (private sector, research and university linkages)
- Co-investment - Total investment attracted into collaborative development projects
- Commercialization – Number of new products & technologies taken to market
- Productivity – Number of projects that result in meaningful productivity improvements against current practices
- SME scale-up success - Total increase in revenue and employment within SMEs
- Talent – Total co-investment into enhancing labour market diversity and sophistication

Our plan aims to deliver on the following key deliverables by 2023



Develop **200** Industrial partnerships through collaborative projects and programs



Engage over **500** organizations



Attract over **\$200 million** in Investments from Industry



Contribute **\$5 billion** to GDP (over 10 years)



Invest in over **35 projects** and platforms



Create **13,500 Jobs** (over 10 years)

The Supercluster will play an important, yet subtle and multifaceted role in our economy. Each year, as part of the operating plan, the Board of Directors will review progress against benchmarks and make adjustments to annual KPIs, program strategies and project investments.

3.7 Stages of Development

Over a ten-year period, we envision that the development of the Supercluster will progress through three different time phases. These phases include a two-year initiation, a three-year acceleration, and five years of enhanced performance and sustainability (Figure 4). The intention is to build on the cohesive partnerships developed through the formation stage, and to eventually become a national resource that is inclusive, diverse and impactful.

Each of the stages are focused on the following areas:



Figure 4. Stages of Development of the Supercluster over 10 years



3.7.1 *Stage 1. Initiation*

During the first two years, the Supercluster’s focus will be to foster collaborative partnerships to develop digital technology solutions. The program will cultivate a collaborative culture among start-ups, SMEs, large technology companies, multinationals, large industry adopters, post-secondary institutions, research institutes and intermediaries.

The collaborative culture is essential to emulate the cluster effects observed in other successful innovation ecosystems such as in Tel Aviv – with its high connectedness and strong partnerships – and ultimately set the stage for further collaborations that will extend over the next decade.

Supercluster Members and Associates will develop project proposals through consortia comprised of at least three organizations, at least one of which will be an SME. Proposals will align with the Supercluster and consortia members' priorities, expanding the participation to a broader set of collaborators, and supporting faster adoption in the health, natural resources, and industrial sectors.

During this period, the first priority is to set-up Supercluster operations and to ready it for the launch and governance of member-based consortia projects. The Supercluster entity must establish the organization’s membership base, create vehicles to foster new partnerships, launch programs, evaluate project proposals, launch projects, co-invest in initial projects and start to build ecosystem capacity.

3.7.2 *STAGE 2: Accelerating Innovation (Years three to five)*

Emboldened by the culture of collaboration that is established through Stage 1, the participants will begin to engage in more ambitious projects, leveraging collective resources and world-class university research capabilities to create interconnected datasets, technology products, and platforms that will position Canadian companies at the forefront of digital technology. These projects will link customer adoption right from the start, boosting industry competitiveness and productivity across an expanding range of sectors. Canada will begin to attract a greater proportion of world-class talent and researchers as a result of the success of the Supercluster.

The first period lays the foundation for the Supercluster’s project portfolio. In this second period, the aim is to use the commercialization pipeline and regular new process, product, and technology platform launches to drive the growth and scale of the operation.



3.7.3 STAGE 3: *Enhanced Performance & Sustainability (Years six to ten)*

During the latter stage of the decade, the product, platform, and technology outcomes of the Supercluster collaborations will begin to extend to the full supply chain of large corporates and multinationals. This will fortify the creation of more start-ups and fuel the growth of SMEs that provide solutions into these supply chains. Larger technology companies will benefit from globally leading platforms that can further reinforce Canada's leadership position on the world stage. This increased performance will build Canada's global reputation and attract top researchers, founders, investors, and senior talent - yielding a virtuous cycle that fuels the growth of more companies.

After the acceleration period, the key is to sustain the momentum created through the initial two periods through continued stewardship of the commercialization portfolio and delivery of program management, leadership development and related services.



4 Building a Robust Innovation Ecosystem

The Supercluster operates through collaborative development projects that support the goals and objectives of strategic programs and the interests of Supercluster Members. These programs enable the Supercluster to articulate clear strategic goals and align the resources of members around common program objectives. By creating program level guidance for project investments, the net result is a mix of complementary projects and partnerships that deliver productivity improvements and grasp global market opportunities.

4.1 Program Strategy

Programs are developed in consultation with Members, industry and technology advisors and other key stakeholders to ensure they will deliver a meaningful impact in strategic priority areas. Our programs are the themes under which project investments are made and the projects selected within each program are how we execute on our strategy and achieve our intended results (Figure 5).

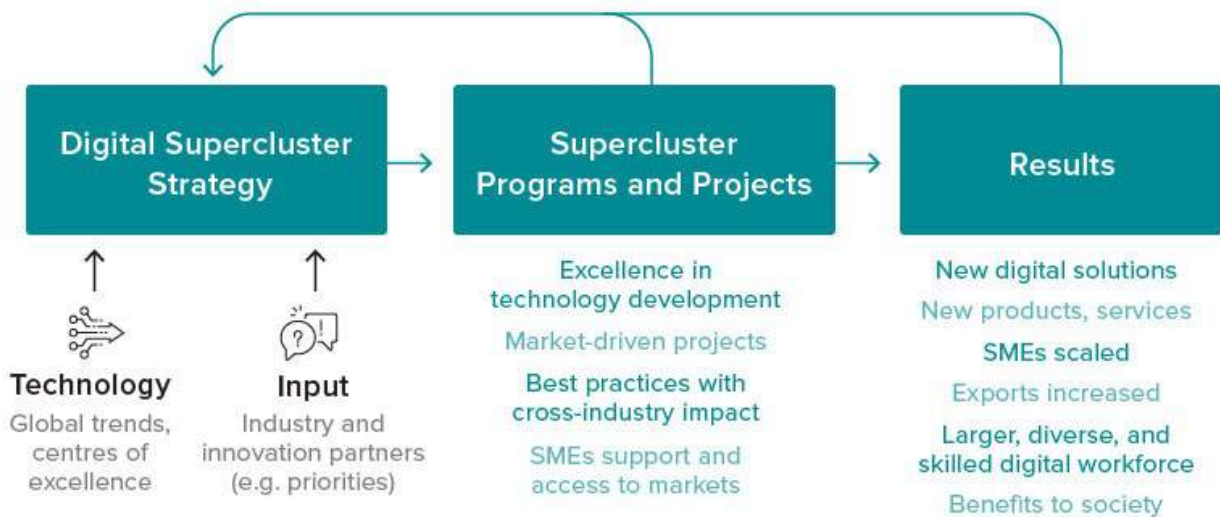


Figure 5: Supercluster Strategy

By its very nature, the Supercluster is seeking to co-fund ambitious and bold projects. As such, not every project will advance. However, by creating the appropriate conditions for collaboration and risk-sharing, the Supercluster will spur the scale-up of more SMEs, drive new products and services, create globally relevant digital technology platforms and result in the creation of 13,500 jobs and \$5 billion in incremental GDP (Figure 6).

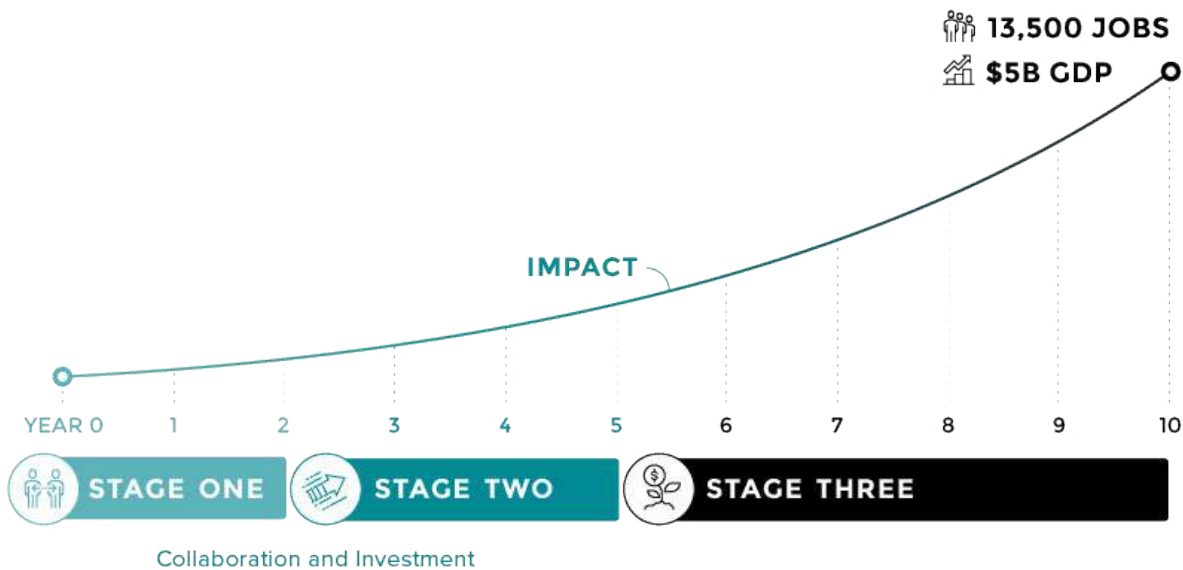


Figure 6. Impact of the Supercluster

We have initially selected digital opportunities that resonate across health, natural resources, and industrial applications, recognizing the strength and significance of these industry sectors in British Columbia and Canada. Over time, we will explore the opportunity to extend the digital technology capabilities to other industry sectors, applying key platform technologies, products, and processes to well-defined industrial challenges in each.

The Program Investment Committee is a committee of the Board of Directors responsible for providing oversight of the Supercluster Program Investment Strategy and the allocation of Supercluster co-investments in order to achieve the goals of the Supercluster. Programs provide focus for Member led projects developed through consortia and these programs will be re-examined annually by the Board.



4.2 Program Mechanics

A program director leads each of the three Technology Leadership Programs. Each director is responsible for developing the overall strategy for the corresponding program and has a set of tools to aid him/her in exploring unique global and specific opportunities – expert councils, strategic advisory sessions, work groups, conferences, etc.

The Supercluster will issue invitations for project proposals from consortia of members and associates whose proposals will be focused on one of the program streams in Technology Leadership or Capacity Building. Each program cycle will create a new cohort of potential projects that will be independently reviewed and competitively assessed – ultimately resulting in the selection of only the highest ranked projects. Once awarded, projects will be contracted through a Master Project Agreement.

4.3 Technology Leadership Programs

The Supercluster delivers the Technology Leadership Programs to enable wide-scale adoption of digital transformation platforms in key industrial segments and develop and commercialize new products, services and platforms. The suite of Technology Leadership Programs is core to the Supercluster securing Canada’s global leadership in digital innovation and securing the social and economic benefits for Canadians.



4.3.1 Precision Health Program

This program aims to establish Canada as one of the world’s leaders in data driven innovations in precision health. We consider the broader definition of precision health by considering genomics, lifestyle and environment factors in combination with clinical diagnostics and treatment processes to arrive at a highly personalized result. Connecting isolated clinical and research data silos and empowering patients with their health data will unlock the potential of Canada’s healthcare system and thus stimulate the creation of globally competitive platforms.

The program will encourage projects that leverage data to:

- Diagnose more precisely.
- Personalize targeted interventions.
- Predict and prevent diseases.
- Engage, inform and empower patients, caregivers, healthcare professionals and clinical researchers.



To attain these goals, new, innovative, digital technology solutions are needed. About 30% of the world's data today is in healthcare and roughly 80% of it is unstructured data, meaning that it is not directly usable by majority of the stakeholders. There is a real need to develop technologies that allow for the intermixing of complex data and systems using a commonly accepted ontology. Furthermore, by rethinking the traditional provider-centric and even service-line-centric approaches and placing the patient at the centre this program will allow the patients to take real ownership of their health data.

The Precision Health Program aims to identify and develop innovative technologies and platforms that allow patients and their custodians to take informed decisions about their health and take preventive actions to stay healthy. This includes the use of personalized information about lifestyle, environment, genetic profiles and possibly connect information that goes beyond the healthcare ecosystem.

At the same time the program will address the need of healthcare professionals to use smart digital technology that allows them to spend more face-to-face time with patients, get access to most recent evidence-based medical knowledge, translational medicine break-throughs, AI-powered diagnostics and advances in genomics and multi-omics. All this will ultimately establish the basis for a precise, personalized healthcare system in Canada, and overseas.

The Program will address the most important challenges in this transformation, namely security, integrity, trust, traceability, privacy and ethics, semantic interoperability, ontologies, and standards. The Program aspires to:

- Improve digital access to healthcare, and health outcomes for all Canadians, including Canada's Indigenous populations and those in remote rural communities by securing digital channels for Canadians to manage their health data and access timely high-quality healthcare services.
- Provide accurate, timely and more precise diagnostics with the utilization of longitudinal data, bioinformatics and digital tools for clinical decision support, advanced analytics and care team collaboration across various points-of-care.
- Improve patient outcomes and reduce adverse drug reactions by integrating digital tools that collectively improve clinical outcomes through tailoring therapies based on phenotypes, genotypes, advanced analytics and translational medicine results.
- Develop tools and programs to ensure healthcare professionals across the regions have a high level of digital literacy and training and an equitable support for patients to enable them to optimize precision medicine.



Deliverables for the Precision Health Program

The Precision Health program is expected to generate the following deliverables and platforms:

- Governance model to empower patients to manage trust, privacy, incentives and flexibility to share health and genomic data.
- Ontologies and interoperability standards to facilitate data flow between systems and services lines.
- A pool of health and genomic data that fuels research, advanced analytics, disease management programs, and population health on large and diverse datasets.
- Core infrastructure that is scalable and can extend secure access to and sharing of highly distributed data to enable collaboration between disjoint clinical specialties.
- Platforms for building large scale digital services like Virtual Care using Internet of Medical Things (IoMT) and full genome sequencing for clinical applications.

To illustrate the use of these platforms, the program will prototype sample products/services in simulated/restricted environments and will build and adopt some new products/services in a real-world environment with some having a path to large scale adoption.



4.3.2 Digital Twins Program

This program will focus on leveraging digital technologies to create real-time, virtual production environments for operations management, simulation, modelling and training.

Industrial data levels are increasing every day. Companies now face a stark choice: harness the power of data to redefine their offerings and transform the speed, efficiency, and flexibility of their operations, or lose out to competitors that do.

The conditions that make Industry 4.0 possible are not unique to Canada. They exist in all industrialized economies. Yet the scale of the transformation required, the complexity of the problems being solved and the interaction and engagement of people in the process have stifled the promised future. There is an imminent need to improve the intelligence, integration and interaction of cyber-physical systems.

Through the Digital Twins program, the Supercluster seeks to support the development and demonstration of cyber-physical systems that will enable step-change improvements in Canadian productivity.



These technologies, where the real and digital worlds interact and learn from each other, will provide critical new insights and facilitate rapid data-driven decision-making in complex industrial systems, thus improving the overall productivity and efficiency of industrial and infrastructure systems in Canada. The Digital Twin Program aspires to:

- Enhance design and production capabilities of firms by creating virtual production and experimentation environments through for the industrial, resource and healthcare sectors.
- Improve the quality of product and through optimized manufacturing processes developing unique analytic and visualization capabilities.
- Enhance industry competitiveness by developing next generation of inspection and maintenance systems and digitizing and integrating entire value chains, from design to service;
- Shorten approval times for industrial projects by providing accurate system-wide analysis of resources, risks and impacts.

Deliverables for the Digital Twins Program

The Digital Twins program will deliver products, platforms and technologies in key strategic areas that drastically increase productivity and efficiency in traditional non-digital industries as well as create the basis for new development practices and new business models across industries:

- Platforms for core infrastructure components for creating digital twins of manufacturing, health and resource operating environments using IoT, virtual reality and augmented reality (e.g., real-time operating data, machine learning, analytics and visualization tools).
- Digital learning factories and production lines that drive productivity improvements in advanced manufacturing operations through the fusion of sensor technology with the simulation environment.
- Virtual and augmented replicas of natural resource, health and infrastructure projects based on aggregated datasets, advanced analytics and modeling to reduce the cycle time for project approvals and provide enhanced project monitoring capabilities.
- Production management systems enabled by VR/AR/MR that help companies visualize data streams and improve planning and decision-making.



4.3.3 Data Commons Program

This program will focus on aggregating data resources, big and small, from multiple stakeholders into shared platforms for exploration, machine learning and innovative application development.

Data is the world's most valuable resource, yet much data that is collected is unstructured and often not digitized. Another significant obstacle to unlocking the value of data is access. Canada's digital economy will be collaborative, allowing multiple parties to securely exchange, create value and achieve unique advantages from data. For Canada's digital economy to emerge, collaborative data commons need to:


- Establish enabling conditions that attract and incentivize data contributions from a diversity of organizations, public and private.
- Create hybrid connectivity between systems and forms of data, and bridge to data silos.
- Process and analyze more data to increase the use of data.
- Harness new computational resources and open innovation to solve previously impossible problems.
- Be accessible, enabling the use and secure sharing of data from any device, anywhere.

To secure a digital future for Canada, new, innovative, digital technologies to collect, store, process, analyze, and visualize data are needed. To realize shared value in the application of these technologies, the Supercluster will seek technologies with opportunities for multi-sectoral engagement and impact, where contributors, stakeholders and beneficiaries may come from private, public and community organizations.

Through the Data Commons program, the Supercluster seeks to inter-connect and normalize data resources from multiple stakeholders into shared platforms. Platforms will enable all Canadians to equitably contribute and participate in open innovation, developing new value through advanced data science, analytics and visualization. Critically, data platforms will help Canadian firms to grow. Together, these technologies and the firms that create them will establish the basis for a high value, digital economy in Canada.

The Data Commons Program aims to:

- Drive productivity improvements in asset utilization, safety and environmental management by leveraging aggregated, large scale datasets from inspection and maintenance operations across multiple operating sites of one or more companies.
- Increase the ease of new start-up formation and new products that wouldn't have been possible without the interconnection between diverse data sources.

- 
- Enable Canada's Indigenous peoples to contribute to, participate in, and benefit from large data collectives associated with sustainable resource and land use management.
 - Enhance industrial growth, competitiveness and sustainability by demonstrating and applying advanced computational resources in strategic sectors.

Deliverables for the Data Commons Program

The Data Commons program will deliver new platforms and technologies that demonstrate integration into real-world systems or sampled in simulated environments through small scale proof-of-concept testing in:

- Unifying principles and guidelines to govern how data stores can be interconnected, linked and analyzed, without necessarily enforcing centralization.
- New business models that incentivize and remunerate based on access to data.
- Core infrastructure that is scalable and allows for secure, trusted access, multi-disciplinary and distributed data in the private sector, government agencies and other community stakeholders.
- Exploratory data collectives from multiple stakeholders for open data innovation, with an emphasis on machine learning enabled by high performance computing and visualization of the data.
- Portals for users with all levels of expertise to access and interact with data and tools.

4.4 Capacity Building Program

The Capacity Building Program is an integral part of the Supercluster's mandate – to ensure Canada's innovation ecosystem has the capacity, technology capabilities, talent and infrastructure to secure global leadership in the digital technology sector and enable social and economic benefits to Canadians.

The program will be regularly informed from key stakeholders across Canada and the regions, including industry, government and academic and training institutions. Priorities will be assessed with the support of a Program Advisory Group and will foster cross-sector collaboration for alignment on talent and resource gaps. In addition, the program will actively seek opportunities identified through the Technology Leadership Program to optimize the success of those projects.



The Capacity Building program is focused on developing digital talent and scaling-up companies with the following specific objectives:

- Develop digital workforce prepared for the jobs of tomorrow with a focus on improving the inclusion and participation of Indigenous people, underrepresented groups and women.
- Scale SMEs by providing the resources for growth and increasing supply chain links among key actors to enhance access to global markets for Canadian companies with technology capabilities.

This program aims to ensure opportunities are distributed to a broad and diverse cross-section of individuals and organizations across the innovation ecosystem in the regions. Our approach to collaboration has some inherent benefits for ensuring diversity and balance in participation. It also provides the opportunity for cross-over training, creating opportunities for women in health technology and leadership.

Deliverables for the Capacity Building Program are integrated within the Technology Leadership Programs of Precision Health, Data Commons and Digital Twins. Together these four programs are expected to have a growing investment in ecosystem development of over \$70 million by 2023.¹⁶

The Capacity Building Program aims to:

- Develop a highly skilled workforce that is diverse, inclusive, & broadly-based through industry relevant programs that enhance digital skills, with a focus on diversity and inclusion and on Indigenous populations, women and underrepresented groups by partnering with others to design and deliver programs for talent development including: education, training, retraining, work experiential learning, business mentorship.
- Enable companies to increase innovation and R&D investments by being able to access relevant talent and expertise in Canada and to continue to attract and retain this talent.
- Improve the ability for companies to scale by supporting entrepreneurship development and mentorship.
- Enhance access to resources, talent and infrastructure to improve the ability for companies to develop products, services, tools and platforms; and participate in Technology Leadership Programs or to enhance access the global markets.
- Support digital innovators by pioneering innovative approaches to sustainable and scalable programs based on best-practices established for continued talent and ecosystem development.
- Champion women (and other underrepresented groups) for leadership in industry by advocating for STEM education and employment.

¹⁶ Assuming 5% capacity building in technology leadership projects in the first year, growing to over 25% by the fifth year.



Deliverables for the Capacity Building Program

- Increase the level of participation of Indigenous people, women and underrepresented groups in the Technology Leadership Programs over five years by partnering with others to design and deliver programs for talent development including: education, training, retraining, work experiential learning, business mentorship for Indigenous populations.
- Create a training platform for the development of Indigenous talent development and enterprise in six in-demand technology fields, providing in-community guidance and supporting the growth of Indigenous enterprise.
- Increase the digital literacy and capabilities of Indigenous populations through work-integrated learning opportunities.
- Increase the depth and integration of ecosystem and capacity building components in the Technology Leadership Programs over five years.
- Provide industry relevant, digital literacy and (re)training for individuals across regions.
- Develop, pilot and scale industry relevant digital education/training certification program across regions.

4.5 Intellectual Property

Projects supported through the Technology Leadership Program will articulate a commercialization pathway which will include considerations for intellectual property. The Supercluster has an Intellectual Property (IP) Strategy that ensures that IP policies and procedures adhere to the following key success factors:

1. **Protect the Value of Background IP.** Ensure that becoming a Member of the Supercluster creates no encumbrances on Background IP and that within a collaborative development project, every Member has the right to define appropriate permission and restrictions on their own Background IP.
2. **Prepare for competition in a global landscape.** Ensure selected projects are backed by high performance project teams with the right mix of resources and expertise required to achieve global market leadership with the proposed innovation.
3. **Maximize the value from Foreground IP.** Take an opportunity management approach that ensures focused leadership for the primary investment opportunity, support for associated supply chain, application and ecosystem development opportunities and the cultivation of investment opportunities around secondary, non-competitive applications;
4. **Demonstrate value to Canadians.** Show how innovation affects all citizens. Share stories around CDTS supported products and technology pursuing big ideas to improve people's lives. Ensure that these stories connect high performance innovation as the path to deliver these new products and technology.
5. **Augment the capacity of SMEs.** Ensure that IP outcomes will benefit SMEs including strategic IP management, generation and retention, which will enable them to grow and be competitive on the global stage.



The Supercluster manages approved collaborative development projects through Master Project Agreement (MPA) that outline the roles, responsibilities, and obligations of each member in a binding agreement. This includes completed negotiations around the details of IP management.

The role of the Supercluster is to be a facilitator of collaboration and therefore, the Supercluster does not seek an ownership position in IP for its own profit. Any IP ownership by the Supercluster will be on behalf of a Project Consortium using the Supercluster as a more efficient vehicle for technology development and risk management. And, as a signatory to all Master Project Agreements, the Supercluster is able to facilitate discussions and approvals to help ensure that final terms and conditions are indeed fair and reasonable.

Supercluster projects will adhere to the Supercluster's Intellectual Property Strategy. In the development of project consortia and proposals, the Supercluster will support partners in establishing relationships with a framework for assets they bring into the project and anticipated sharing of benefits arising from the project (and potentially beyond), including rights and benefits of IP at the project development stage to optimize success. The Supercluster will support members and potential projects by supporting a sound IP strategy and position it as a positive vehicle of growth while employing best practices and developing internal competencies in managing IP through strong education (e.g., workshops) and support services.

The Supercluster will help to identify and maximize the opportunities to develop, protect, commercialize and share IP. This includes the development of an IP Registry supported by a set of clear, transparent and predictable IP ownership policies and licensing structures for Foreground Intellectual Property including processes for Members to request and negotiate licenses to use Foreground IP.

The IP Registry also has a monitoring element to follow up and ensure IP is maximized for the benefit of members and the ecosystem. The Supercluster's IP registry is an internal record system that supports the monitoring and management of Supercluster-supported IP. These records confirm ownership, licensees, associated rights, and commercialization outcomes.

The Supercluster's IP Manager will support the Supercluster and project teams in the and will advise the Supercluster, its member organizations and other stakeholders on best practices related to IP; operationalize the IP strategy within the Supercluster and projects; provide guidance, support, development and evaluation of all intellectual property related to these technology projects. The net result is an IP enabled development portfolio that creates new digital products, processes and technology platforms which generate new revenues, which in turn, stimulates employment growth and capital investment.



4.6 *Digital Infrastructure*

The Supercluster will help to identify and maximize the opportunities for Members to acquire and invest in advanced digital infrastructure. As a trusted stakeholder in the innovation ecosystem, the Supercluster will advise private, public and non-profit organizations and initiatives on how best to align their individual goals for the maximum ecosystem benefit. As a convener and facilitator, the Supercluster will be in a unique position to explore opportunities, and perhaps lead, strategic digital infrastructure investments. The result will be a globally recognized proving ground for next generation digital technologies, leveraging the region's advanced digital infrastructure to generate new insights for Members, and for non-Members looking to invest in the region.



5 Organization and Management

5.1 Corporate Structure

Canada's Digital Technology Supercluster is a not-for-profit corporation established in 2018 under the Canada Not-For-Profit Act focused on technology development activities and building a robust innovation ecosystem.

The Supercluster is a member driven organization and members elect representatives to participate on the Board of Directors. There are two ways in which organizations can join the Supercluster: as a Member or as an Associate. Figure 7 below outlines the benefits of being a Member or Associate.

REGULAR AND GOLD MEMBERS	ASSOCIATES
<ul style="list-style-type: none">• Annual program commitment to access Supercluster funds• Eligible to receive direct Supercluster funding• Set strategy and direction of Supercluster programs• Eligible to be part of board and committees• Can develop and lead projects and submit project proposals• Access to member-only workshops and events	<ul style="list-style-type: none">• No program investment commitment• Ineligible to receive Supercluster funding (except for capacity building)• May participate in projects led by members• Profiled in Supercluster innovation directory, available for members seeking project partners• Networking and presentation opportunities at Supercluster at tech forums and Supercluster events

Figure 7. How to get involved

The Supercluster is an industry-led consortium and a new innovation partnership model. The initial cohort of members includes startups, small, medium and large technology companies and a wide array of leading companies from multiple sectors including forestry, mining, manufacturing, aerospace and healthcare, as well as post-secondary institutions. This is complemented by more than 500 organizations that have signed on to become Associates in the Digital Technology Supercluster.



5.2 Governance

5.2.1 Board of Directors and Board Committees

The **Board of Directors** is responsible for the strategic direction and governing policies of the organization and follows the diversity and inclusion values of the organization. The Board of Directors are determined by the Members of the Supercluster and consists of members which represent broad multi-disciplinary and multi-sectorial experience. At least one third of our board are independent directors and half of our board directors are women.

Directors are appointed for a one-year term at the Annual General Meeting. The Board meets quarterly and approves the organization's strategic plans, corporate objectives, major project investments and annual budgets.

The members of the Board of Directors participate on four Board Committees that deal with financial and operational activities. The Board Committees are:

- Executive
- Governance
- Finance and Audit
- Program Investment

5.3 Systems of Internal Control

The Supercluster has systems of internal control that will incorporate monitoring, information and communication, control activities, risk assessment and the control environment. The organization is aligning its systems of internal control with its Financial Management Framework.

As part of establishing operations, the Supercluster will have a high standard of control activities that will include: policies and procedures, approvals, authorizations, verifications, recommendations, performance reviews, asset security and segregation of duties.

The Board of Directors review financial statements quarterly. External auditors audit annual financial statements and the financial practices, procedures and financial management of the Supercluster. Performance against our annual budget is monitored monthly by management and quarterly by the board.

As described earlier, we use a disciplined review system with external advisors to assess potential investments for each of our programs.

5.4 Centre Operations

The organizational structure of the Supercluster consists of a leadership team reporting to the Chief Executive Officer which includes: Chief Financial Officer, Chief Technology Officer, Vice-President Government Relations and Public Affairs, Vice-President, Business Development and Partnerships, and a Director of Strategic Foresight & Planning.

Functional areas of the organization are shown in Figure 8. The role and activities for each core function are described below. The Supercluster develops annual performance targets and conducts reviews for each unit as part of our management process.

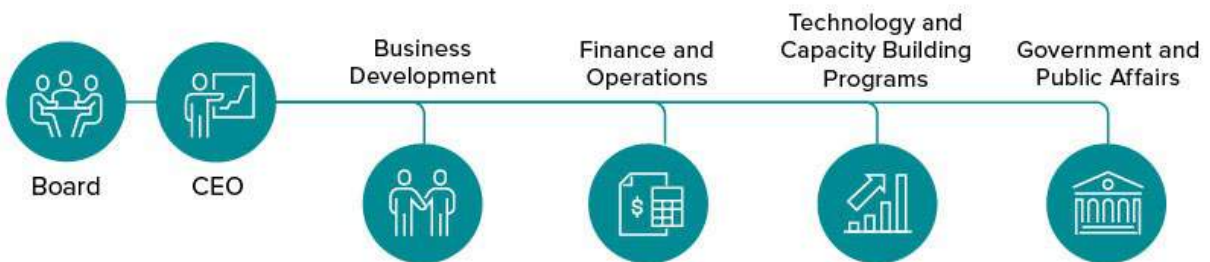



Figure 8. Digital Technology Supercluster Organization for 2018-2023

Chief Executive Officer (CEO)

The CEO is responsible for the performance of the organization. The CEO develops the organization's strategy and direction for presentation to the Board and ensures that the strategy will fulfill the mandate of the organization from members, the Innovation Superclusters Initiative, and other stakeholders. The CEO builds and leads the executive leadership team, and develops and models the culture and behaviour expected of others throughout the organization.

Technology Leadership and Capacity Building Programs

Programs are guided by the Chief Technology Officer (CTO) who is responsible for a high-quality technology portfolio, its management and developing technology pre-market projects. The CTO leverages the membership to build collaborative development projects aligned with program-based goals and objectives through a staff of program directors and business analysts. The CTO is responsible for making sure that projects align with the objectives and goals of our Supercluster and that these projects will deliver new process, product, and technology platforms that will move through the development pipeline to launch.



Priorities in capacity building and ecosystem activities are also informed by the CTO to support of successful outcomes from technology projects and a robust Innovation ecosystem.

Business Development

The Business Development and Strategy function is responsible for the engagement, support and retention of Members, recruiting additional Members and creating strategic partnerships with superclusters and organizations. The Business Development function develops the relationships and fosters an environment that will lead to a strong, vibrant, diverse and evolving Membership base. Members lead the development of globally leading and competitive project proposals that will deliver on the goals of the Supercluster. The VP, Business Development and Partnerships will also lead the marketing, communications and promotion of the Supercluster as foundation to creating the robust environment that will ensure the delivery of world class project proposals.

Strategic Planning

Critical to the success of the Supercluster is ensuring that programs support projects, products and platforms that are world class, transformative and meaningful. The Strategic Planning function provides support across the organization and informs program development, business planning, and market intelligence through a comprehensive review of global trends and developments in digital technologies. This ensures that the Supercluster has good quality intelligence to inform its program development and support effective strategic planning.

Finance and Operations

This function is led by the Chief Financial Officer (CFO), who oversees all financial-related matters, including financial planning, financial and performance reporting, cash flow management and ensuring comprehensive and careful oversight relative to the Government of Canada contribution. This function is also responsible for human resources, legal and information technology management.

Government Relations and Public Affairs

The Government Relations and Public Affairs function is responsible for helping to shape, guide and build essential relationships for the Supercluster across multiple stakeholders in the public, academic, research and government domains. This includes the oversight and management of the Capacity Building program with the CTO, and in support of ecosystem requirements and in concert with the needs of the Technology Leadership programs.



6 Financial Information

6.1 Investment Strategy

The baseline financials for the Supercluster’s five-year business plan are based on the initial leveraging of the investment private sector and Government of Canada investment to create an initial program investment level of \$360 million.

The initial investment of \$360 million is expected to be allocated to different programs. This investment allocation characterizes our forecast of investments in projects within the Technology Leadership Programs of Precision Health (30%), Data Commons (40%) and Digital Twins (30%) (Figure 9).

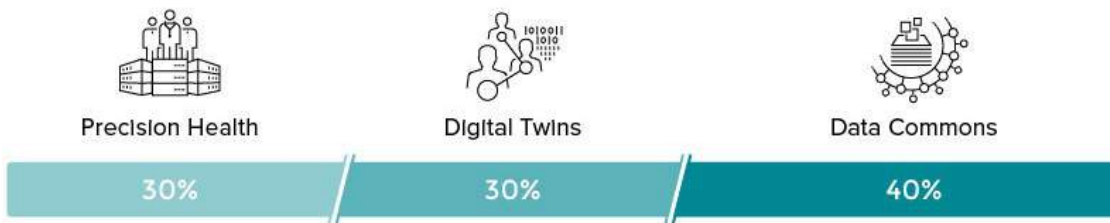


Figure 9. Investment allocation by program stream

The Supercluster will manage its portfolio of projects through the allocation of investment over the five-year period across the four program areas. The Board is responsible for reviewing the portfolio at least annually and assesses required investment levels and distribution of investment across the programs. It is expected the general distribution of investment commitments to projects in the Technology Leadership programs of precision health, digital twins and data commons will peak at year three as outlined in Figure 10.

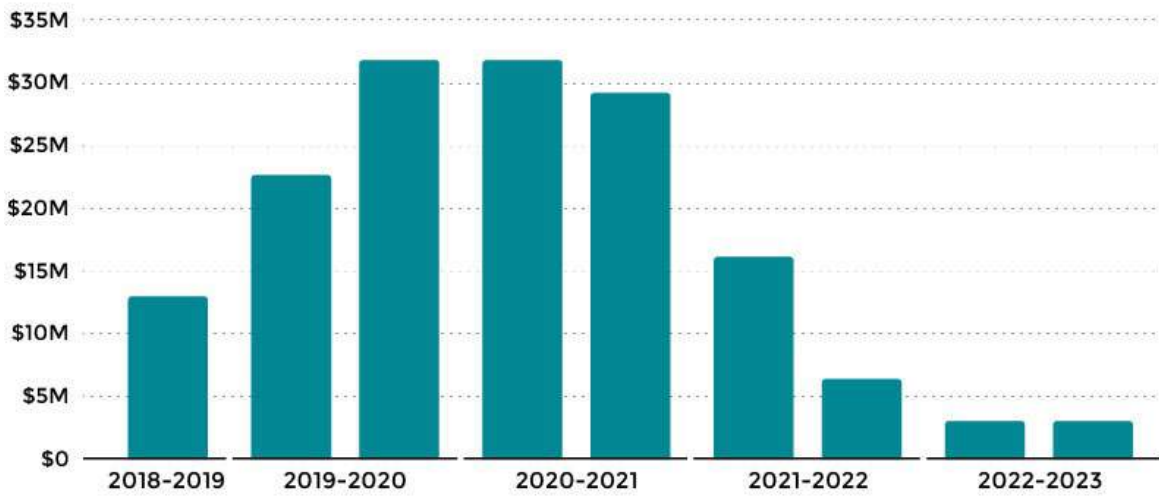


Figure 10. Investment allocation in Technology Leadership Programs over time.

6.2 Co-investment

Our membership is composed of a diverse group of organizations across various economic sectors, as are our investment in projects. The Supercluster invests in collaborative development projects through a co-investment model. Funding from the federal government of \$153 million is matched with investment commitments of over \$200 million from the initial cohort of private sector, research and post-secondary partners.

Figure 11 illustrates the diversity of investment commitments from our partners, including the federal government, small and medium enterprises (SMEs), large Canadian companies, multi-national enterprises and post-secondary and research institutions anticipated over a five-year period.

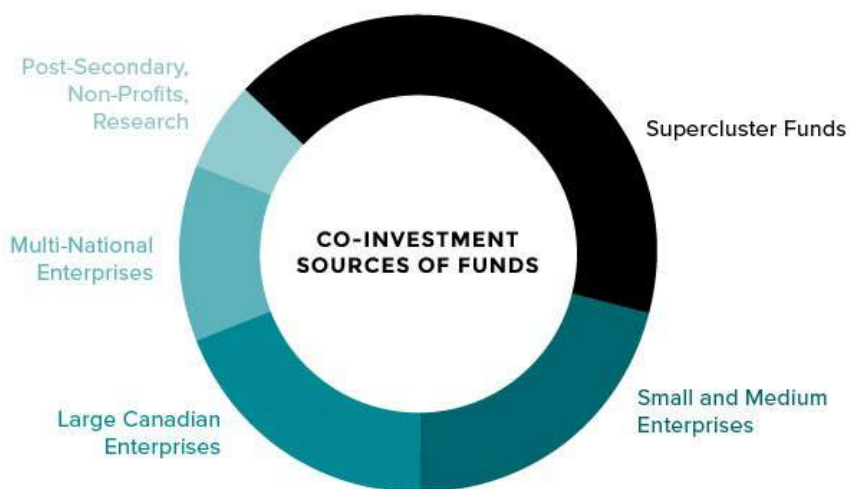


Figure 11. Co-investment sources of funds



6.3 Ecosystem Investment

One of our key goals is to address gaps and enhance the attributes of the regional innovation ecosystems to strengthen the assets and key elements that contribute to developing a world-leading Supercluster. This will be achieved through a combination of targeted capacity building projects and collaborative technology development projects that strengthen supply chains, achieve meaningful collaboration between private, academic and public sector organizations and build technological capabilities and commercialize products, processes and services and competitively position Canada’s leading industries.

Through the combination of these activities, the projected investment in the ecosystem will grow over the five-year period through a combination of ecosystem development activities and investments within the three Technology Leadership programs, beginning at 5% in the first year and growing to over 20% by the fifth year. This will complement directed investments in priority areas through the Capacity-Building projects. Over the five-year period, we expect the total investments to grow to \$70 million (Figure 12).

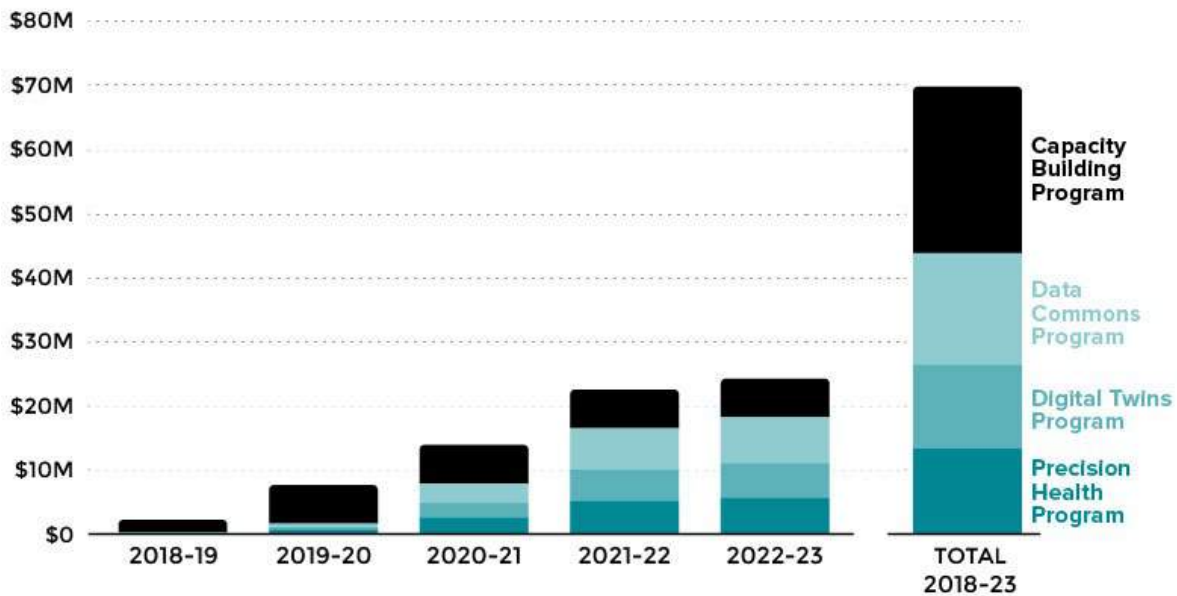


Figure 12. Increasing Ecosystem Investment

6.4 Financial Projection

The five-year plan is based on the allocation of \$153 million from the Innovation Supercluster Initiative of the Government of Canada to be allocated over the next five years. The projection also assumes that there is an additional \$7.5 million of investment commitments from other sources, including the Province of British Columbia, over the next five years towards operations and the Capacity Building program. The projection is presented in the Table 1.



Technology and Capacity Building Programs	2018-19	2019-20	2020-21	2021-22	2022-23	TOTAL
Technology Leadership	<i>in C\$ millions</i>					
Data Commons	8.1	29.1	29.1	29.0	29.0	124.4
Digital Twins	6.1	21.8	21.8	21.8	21.8	93.3
Precision Health	6.1	21.8	21.8	21.8	21.8	93.3
Subtotal	20.3	72.8	72.7	72.6	72.5	310.9
Capacity Building	1.9	6.0	6.0	6.0	6.0	25.9
Technology and Capacity Building	22.2	78.8	78.7	78.6	78.5	336.8
Corporate Programs and Management	3.0	4.9	5.0	5.1	5.2	23.2
Total	25.2	83.7	83.7	83.7	83.7	360.0

Table 1. Financial Projection 2018-2023.

Corporate Programs and Management include organizational support costs for strategy, finance, administration, education, member engagement, communications and management and represents 6.0% of spending of the plan (Figure 13).

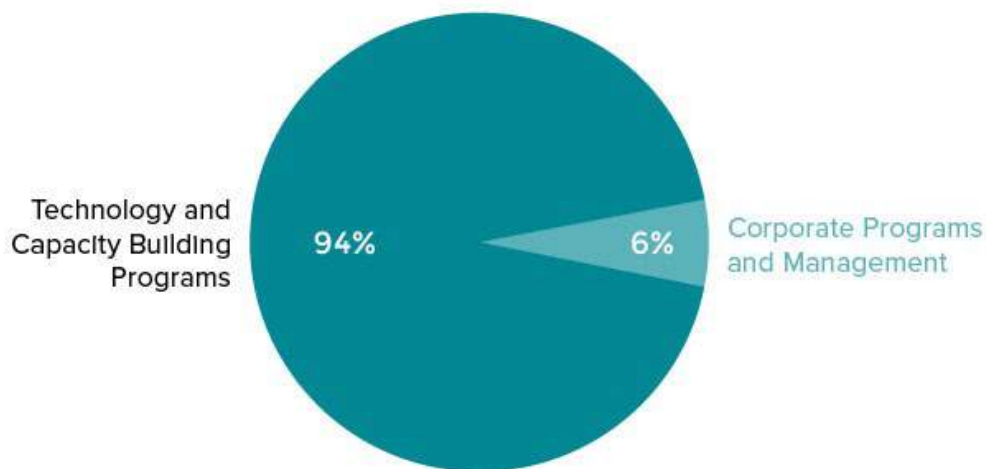


Figure 13. Spending on corporate programs and management.



7 Conclusion

Canada's Digital Technology Supercluster is focused on positioning Canada as a global leader in digital technology innovation and unlocking the potential of data in the era of the intelligent enterprise. Through a collaborative co-investment model Supercluster Members and Associates will develop ambitious technology development projects through consortia-based teams. Through these projects and the support and guidance from the Supercluster staff, our activities will contribute to the development of a high performing ecosystem, scale small and medium enterprises, create more globally competitive companies, leverage the power and promise of leading research and researchers, attract and retain globally leading talent and expand the global competitiveness and market access for Canadian companies.

Our targeted investments across natural resources, healthcare and industrial sectors will provide the initial areas of focus for our projects which will deliver digital solutions to critical issues of operational excellence, cost competitiveness, data governance, privacy, market access and talent development. At the same time, our projects will position Canadian companies to be leaders on the development of technologies, platforms and products that will accelerate the digitization of organizations and society.

Over the next five years the organization will invest across the three Technology Leadership Programs: Precision Health, Digital Twins and Digital Commons as well as devoting dedicated investments in Capacity Building. Together, these investments will contribute to the development of a high performing ecosystem, create an estimated 13,500 new jobs, \$5 billion in GDP, expand global market opportunities for Canadian firms. Backed by a skilled, diverse and inclusive workforce for Canada's growing digital economy, Canada is positioned as a global leader in digital technology through a supercluster that unlocks the potential of data in the era of the intelligent enterprise.