

# Strategic Plan

# Table of Contents

Overview	05
The Innovation Supercluster Initiative	06
Mission	06
Executive Summary	07

## 1. SCALE AI'S ECOSYSTEM

9

- AI ecosystem
- Supply chain opportunities
- Sectors in focus
- Geographic scope

## 2. STRENGTH AND GAPS OF THE ECOSYSTEM

12

### 2.1 Ecosystem strengths

- Three key strengths
- A strong partnership

### 2.2 Ecosystem gaps

- Lack of AI adoption
- Need for better technology transfer
- Sub-scale barriers
- Talent in data/AI

## 3. SCALE AI'S FIVE KEY BUSINESS PRIORITIES

15

- 3.1 Creating a competitive advantage for businesses of all sizes
- 3.2 Creating new business opportunities
- 3.3 Improving Canada's competitiveness on the world stage
- 3.4 Supporting sustainable growth
- 3.5 Improving the strength of our talent pool
- 3.6 Overview

23

4. SCALE AI'S PROGRAM STREAMS

**4.1 Adoption of AI-powered supply chain**

- Opportunity and challenge
- Program definition

**4.2 Commercialization of AI-powered supply chain solutions**

- Opportunity and challenge
- Program definition

**4.3 SME AI scale-up support**

- Opportunity and challenge
- Program definition

**4.4 Current and future workforce development in AI**

- Opportunity and challenge
- Program definition

**4.5 Collaboration development**

- Membership growth
- Collaboration engagements
- Online collaboration platform
- Scientific Committee
- Global advantage engagements
- Intellectual Property (IP) strategy

33

5. 5. SCALE AI'S TECHNOLOGY PRIORITIES

**5.1 Overview**

**5.2 Responding to business problems**

- Examples of business solutions
- Enabling better responsiveness to demand

**5.3 Designing the building blocks of the next-gen supply chain**

- Example building blocks
- Data exchange

**5.4 Additional opportunities**

- Integration opportunities
- Sustainability opportunities

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**6. SCALE AI'S ESTIMATED BUDGETS**

Financial overview

40

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**7. SCALE AI'S KEY SUCCESS INDICATORS**

What success will look like Measurement

42

# Overview

The purpose of this strategic plan is to articulate the objectives and priorities of **Scale AI**. This entity will be a critical driving force to accelerate the adoption and commercialization of artificial intelligence (AI) in Canadian supply chains.

The plan identifies the ecosystem opportunities and gaps that need to be addressed. It also discusses the desired outcomes for its members and the Canadian economy, along with key programs and value creation drivers. The plan will also outline how the supercluster will define and measure success.



# The Innovation Supercluster Initiative

**“Clusters can enable companies to leverage business environment quality and to reach higher economic performance. Strong clusters are not a substitute for advantages in other dimensions of business environment quality, but companies in strong clusters are often better placed to turn business environment advantages into competitive advantages.”<sup>1</sup>**

In June 2017, the Government of Canada engaged national businesses of all sizes and other innovation actors – including post-secondary and research institutions – to propose ambitious strategies that would develop superclusters of innovation. The goal here is to establish and position Canada as a leader in the global innovation race. Based on collaboration, the superclusters are building high-performing innovation ecosystems aimed at creating value for Canada’s economy and citizens. In February 2018, **Scale AI** (Supply Chains and Logistics Excellence AI) was named as one of five successful business-led innovation superclusters to receive federal funding.

## Mission

**Scale AI is Canada’s artificial intelligence (AI) supercluster** dedicated to building the next-generation supply chain and boosting industry performance by leveraging AI technologies.

A business-led consortium, **Scale AI** will drive economic growth, bolster Canada’s leadership in the global innovation race, support the building of world-leading businesses, create highly skilled jobs, and accelerate the adoption of AI-powered technologies.

**Scale AI** will contribute to the development of an innovative, competitive, diverse and inclusive Canadian economy, with a focus on Small and Medium Enterprises (SMEs).

More precisely, **Scale AI** aims to:

1. Create **productivity gains** across industries thanks to AI-powered supply chain optimization
2. **Generate AI-powered supply chain** intellectual property (IP) and new business opportunities
3. Strengthen Canadian supply chain players through **innovation and AI integration** in products and services
4. Promote **responsible usage and development** of AI-related technologies.

<sup>1</sup> Christian H.M. Ketels and Olga Memedovic, “From clusters to cluster based economic development,” Int. J. Technological Learning, Innovation and Development, Vol. 1, No. 3, 2008 : 379

# Executive Summary

**Artificial intelligence (AI) technologies are beginning to reach** mainstream awareness. This has the potential to create a profound impact on businesses and strategies.

**Supply chains, like many industries, will be disrupted by digital technologies and AI.** The massive amounts of supply chain data can be used to create enormous business value.

**This is critical for Canada** as the Canadian supply chain provides almost 1 million jobs and contributes nearly 10% to the GDP. Supply chain activities transform and move products and services, creating value for firms, suppliers, distributors and consumers. Supply chains are key to growth, competition and sustainability.

As the backbone of the economy, supply chains propel all industries. In 2015, \$1 trillion worth of goods were moved by Canada's transporters, of which **\$525 billion** were exports according to Statistics Canada.

**Now is the time:** Canada, as a trading nation, must leverage its leading position in AI research to strengthen its economy and bring its impressive research and development (R&D) achievements to the field. Canada needs the supply chain of the future, powered by AI, to prepare for impending disruptions.

Canada's Small and Medium Enterprises (SMEs) – which represent 80% of total private employment – need to be supported in bringing these advanced technologies into their operations, in collaboration with research institutes, service providers and large corporations.

**Scale AI** has a **unique opportunity** to simultaneously bolster Canada's leadership in AI and data science. The creation of the supercluster will allow us to foster industrial collaboration among companies of all sizes and shape the next generation of intelligent supply chains. **Headquartered in Montréal** and centered in the Québec City-Waterloo corridor, the impact will be pan-Canadian, thanks to the nation-wide network of our members.

This industry-led ecosystem gathers a **wide diversity of players, both from the AI world and the supply chain industry:**

- Firms of all sizes: from multinationals and large enterprises to small firms and startups
- Three verticals in focus: consumer and retail, industrial goods and manufacturing, infrastructure and construction
- Two horizontals in focus: transports, logistics and supply chains services; digital and AI
- Enabling organizations: incubators, investors, professional associations
- World-class academic research labs: IVADO and its parents: HEC, Polytechnique and Université de Montréal; University of Waterloo; University of Toronto and a national network of best-in-class research institutions

The future growth of the membership will continue to strengthen **Scale AI** by bringing in additional members, including SMEs and experts across all industries.

**Scale AI** will transform the future of Canada's innovation ecosystem through its five key programs:

1. **Adoption of AI-powered supply chain:** drive productivity and competitiveness of Canadian firms by fostering deeper and better use of AI technologies in supply chain operations.
2. **Commercialization of AI-powered supply chain solutions:** enhance offering and go-to-market of solution providers by developing, industrializing and expanding AI-powered products and services applied to supply chain management.
3. **Small business AI scale-up:** drive SME and startups scale-up and grow the world's best AI products and services providers by supporting a range of initiatives including incubation, mentorship and business connection-building.
4. **Current and future workforce development in AI:** boost the skills and diversity of our AI talent pool by augmenting the pipeline of future talent, reinforcing the links between academia and the industry and upskilling the industrial workforce.
5. **Collaboration development:** encourage easier collaboration, IP and data sharing and new synergies.

The supercluster will drive incremental **impact at scale** – i.e. by 2028:

- More than \$16.5 billion GDP impact
- More than 16,000 jobs created

Our plan will have **a deep, lasting effect on Canada's growth** and global advantage by enabling a broader adoption of AI by businesses and upskilling our workforce. A key focus will be on fostering AI adoption in Canadian SMEs, helping improve their competitiveness on the global stage.

**Scale AI's** ambition is to kick-start a new form of collaboration and value creation model. This will be sustained in the long run and can expand in the future to other industrial sectors and business functions.

**AI and supply chains are prominent value creators.** When combined, they can profoundly enhance our collective destiny. **Scale AI will seize this ground-breaking opportunity.**

# 1. Scale AI's Ecosystem

## AI ECOSYSTEM

There's currently a disconnect between the business world and machine learning academia. One of the main goals of **Scale AI's** activities is to create a rich AI ecosystem, which will bridge the gap between these two entities and create the necessary space for collaboration.

How will **Scale AI** achieve this? Two of the organization's founding members are world-class organizations – IVADO and the University of Waterloo. There's also an agreement between several Canadian universities to facilitate research. The academic institutions include the University of Laval, University of Toronto, Université de Montréal, HEC and Polytechnique.

In addition to this educational aspect, **Scale AI** also has a strong relationship with several AI incubators and accelerators across the country. These organizations include the Creative Destruction Lab in Montréal and Toronto, Velocity (North America's largest free space incubator at the University of Waterloo) and the NextAI incubation program also based in Montréal and Toronto.

To help companies integrate AI into their processes and technologies, **Scale AI** Members will also have the opportunity to use labs based in Québec or Ontario such as the Vector Institute, IVADO Labs and Element AI among others to jumpstart their business transformation.

## SUPPLY CHAIN OPPORTUNITIES

**Supply chains are the backbone of Canada's economy**, as they provide over a million jobs and contribute 10% to the country's GDP. Supply chain management involves anything from operational planning, sourcing, manufacturing, distribution to delivery and services. Therefore, supply chains are critical value creators for all sectors.

For Canada to remain competitive, innovation is a necessity. Big data is driving a revolution in machine learning, operations research and business analytics. There are also new methods that optimize the way organizations track and exchange goods and services. These new ways include autonomous systems, robotics, blockchain and the IoT (Internet of Things) technology.

Above all, **supply chains generate an enormous amount of data**, and there is an opportunity to benefit from AI applications. Artificial intelligence is on the verge of revolutionizing supply chains by generating insights in real time. This inevitably supports decision-making and increases human productivity.

"AI, combined with advanced analytics, will enable supply chain planners to make more forward-looking, strategic decisions and spend less time on reactive problem solving."<sup>2</sup> AI-powered solutions have the potential to impact industries across sectors.

**Canada's long-term economic growth and sustainability** depends heavily on embracing supply chains that are responsive, integrated and intelligent. In addition, supply chain management and innovation are a natural fit for collaboration between players, which enables one of the key objectives of the supercluster's initiative.

<sup>2</sup> Gary Hanifan and Kris Timmerman, "New Supply Chain Jobs Are Emerging as AI Takes Hold," Harvard Business Review, August 10, 2018, <https://hbr.org/2018/08/new-supply-chain-jobs-are-emerging-as-ai-takes-hold>

## SECTORS IN FOCUS

In 2015, more than **\$1 trillion** worth of goods were moved by Canada’s transporters, of which **\$525 billion were exports** according to Statistics Canada.

**Scale AI** will better position Canada as a trading nation by facilitating the following:

- Nurture connections with global value chains
- Forge new partnerships with best-in-class supply chain research groups worldwide
- Strengthen the position of Canadian supply chain players
- Improve productivity and efficiencies across all industries
- Generate new business opportunities (startups, new IP and new markets)

**Scale AI** creates the opportunity for collaboration between key players and stakeholders from both **horizontal and vertical sectors**.

	Primary			Secondary	
→ VERTICALS	Consumer Goods and Retail	Industrial Good and Manufacturing	Transports and Logistics	Intrahospital Logistics	Infrastructure and Construction
→ TRANSVERSALS	AI and Digital Technology Providers			Supply Chain Solutions Providers	

## GEOGRAPHIC SCOPE



# Waterloo - Québec City Corridor

**Scale AI** is based in Montréal, Québec and has an office in Waterloo, Ontario. The Québec City-Waterloo Corridor is an important operating region. Most participants and collaborators are based in the technology hubs of Québec and Ontario. The impacts will be felt across Canada by strengthening the virtual and physical infrastructure that connects businesses and communities.

The **positive impacts** will include the following:

- Nationwide network of AI/supply chain researchers
- Large-scale players leveraging their nation-wide presence
- Dense national operation networks of supply chain players
- Types of technology that can be operated from anywhere

The supercluster will have **a strong global dimension:**

- Integrating ecosystem players into global value chains
- Establishing global industrial, digital and supply chain partnerships
- Contributing to the definition of the global standards for intelligent supply chain

# 2. Strength & Gaps of the Ecosystem

**Scale AI** will position itself as a world-leading innovation ecosystem by strengthening its competitive advantage in AI and intelligent supply chains. The aim is also to address the current gaps in the ecosystem.

## 2.1 Ecosystem strengths

The Québec City-Waterloo corridor contains strategic assets for developing and sustaining a world-class collaborative supercluster.

### THREE KEY STRENGTHS

**Scale AI** represents three unique strengths that will shape the artificial intelligence landscape in this country.

#### World-class infrastructure and industry density:

- Québec and Ontario are at the heart of North America's supply chains. We operate some of the most highly advanced and globally connected supply chains in the world. An example includes the aerospace and automotive industries.
- The region boasts Canada's most advanced infrastructure, with world-class airports and ports, alongside some of North America's busiest road, rail and sea networks.
- The region supports key industrial players in Canada, accounting for nearly 60% of industrial GDP. Our partners include many of Canada's leading employers.
- The involvement of players from across Canada's provinces further enhances the strength of the supercluster.

#### World-class AI innovation and entrepreneurship ecosystem:

- **Scale AI** will leverage Canada's leading startup accelerators. This includes the aforementioned Creative Destruction Lab, which serves as the world's most intensive AI startup factory. There's also NextAI, a global leader in accelerating AI ventures and ideas, and Velocity, the largest free startup incubator in the world.
- Montréal is one of the world's fastest growing technology startup hubs. Meanwhile, the Waterloo region boasts the second highest startup density in the world after Silicon Valley (Compass, 2015).
- The region has become a magnet for talented tech professionals from around the world. It's also home to the most diverse and creative communities in Canada.

### World-class research and technology excellence in AI and Information and Communications Technologies (ICT):

- Montréal and Toronto are the epicentre of a global revolution in ‘deep learning’ that has attracted investment funds from multinationals (Google, Facebook, Microsoft among others).
- IVADO, the University of Waterloo, the University of Toronto and other academic partners offer Canada’s leading research groups for data science, optimization, operations research, IoT, autonomous systems, robotics, cybersecurity and blockchain.
- **Scale AI** partners include some of the world’s most prominent AI researchers in the industry, research labs and academic institutions.

## A STRONG PARTNERSHIP

The **Scale AI** innovation ecosystem has tremendous strengths in depth. The supercluster brings together key players to build an efficient AI-powered supply chain. Below we outline which sectors will be impacted by artificial intelligence integration.

- **Consumer goods:** sector partners include brick and mortar retailers, produce and dairy distributors, clothing producers and distributors, and e-commerce specialists.
- **Manufacturing:** sector partners include original equipment manufacturers (OEMs), discrete product manufacturers, as well as tier-one and tier-two suppliers.
- **Infrastructure:** sector partners include specialize in engineering, in construction and in property management.
- **Healthcare:** service providers sector partners operate or support critical pharmaceutical supply chains.
- **Logistics:** sector leaders span road, rail, air and sea transport, allied with digital logistics service providers. For the ICT sector, partners specialize in machine learning and AI platforms, business analytics software, and in blockchain.
- **Communications:** telecom, 5G and IoT as well as partners from the wider tech sector, including automation and robotics enterprises.

Every day, these firms – big and small – depend on supply chains. Their success depends upon streamlining and strengthening their own supply chain, and those of their clients and customers.

Alongside other **Scale AI** enablers, other entities represent a spectrum of stakeholders in intelligent supply chain management. Examples of these entities include banks, VC firms, incubators, professional associations, government agencies, standards bodies, post-secondary research institutions and global supply chain innovation partners.

## 2.2 Ecosystem gaps

The global competition on supply chain efficiency is increasing and changing on a yearly basis:

- Industrial value chains are increasingly global. This means a country's supply chain is a necessary asset to attract activity, especially higher-value add activities. This can include research and development, engineering alongside advanced production activities.
- Quick adoption of advanced supply chain technologies increases the competition between companies and countries.
- Several developed and emerging economies are leading the charge on intelligent supply chain. These countries include both Germany and South Korea.

Disruptions at the local level, such as Uber-like “disintermediation” or cutting out the middleman, emphasize the significant shift which is happening in supply chain.

In this context, Canada's starting point leaves room for improvement:

- Canada ranks 14th in the World Bank's Logistics index, below the U.S., Germany and UK.
- Canada lags behind many countries in labour productivity. This is due to low spend on research and development in relation to the digital realm – especially for SMEs (small and medium enterprises).
- Canadian labour productivity is growing slowly, while the potential of efficient supply chains has not been leveraged to date.

### LACK OF AI ADOPTION

According to a report by The Globe and Mail, “AI deployment has not yet been a “real success” for the country's companies. Canada ranked last out of 10 countries, with just 31 per cent of adopters of the technology claiming successful AI deployment, compared with 59 per cent in India and 58 per cent in Germany according to the study by Forbes Insights.”<sup>3</sup>

**Technology compatibility is an issue.** Supply chain applications are often created within sectors or are applicable only to a single firm. Non-interoperable technology limits collaboration and opportunity.

Finally, we need to bridge the gap between AI development and its adoption by the industry. Leveraging this competitive advantage can give Canadian companies an edge to provide new sources of business value.

<sup>3</sup> Christopher Reynolds, “Canadian firms lagging behind in artificial intelligence adoption, report says,” The Globe and Mail, September 24, 2018  
<https://www.theglobeandmail.com/business/article-canadian-firms-lagging-behind-in-artificial-intelligence-adoption/>

## NEED FOR BETTER TECHNOLOGY TRANSFER

“Subpar commercialization [of innovations] may be the result of various barriers preventing the efficient translation of research into technological innovations that firms can commercialize, such as a disjuncture between academic and industry cultures reward systems [as well as] poor academia-business linkages.”<sup>4</sup>

**Scale AI** will address this gap by fostering collaboration and communication. There will also be support to develop projects and execute a framework between different types of organizations to align on objectives. **Scale AI**'s strategy and structure will rely on connecting different types of companies such as:

- Developers with adopters
- Entrepreneurs and startups with medium and large firms
- Academic institutions with industry experts
- Government and financial institutions with participants

Therefore, **Scale AI** will provide a multi-axis collaboration forum to enhance joint innovation between the various player types. **Scale AI** will also promote responsible usage and development of AI-related technologies.

# 3. Scale AI's Five Key Business Priorities

Canada has the potential to be at forefront of the global AI revolution – we must now bring our R&D to the field to become a more prosperous economy, a global trading hub and an industrial talent magnet.

AI will transform supply chains around the world. The Economist reported an estimated 30% of all future value to be created by AI in the next 20 years will stem from supply chain applications.

Why?

- The availability of massive amounts of supply chain data
- The complexity of optimization allows for technology to add value to human decision-making
- The scale of profitability for businesses through forecasting, planning, sourcing and delivery

<sup>4</sup>Expert Panel on the State of Science and Technology and Industrial Research and Development in Canada, “Competing in a global innovation economy”

Scale AI will transform Canada's supply chains through the wide deployment of Artificial Intelligence. Next generation supply chains will produce massive amounts of data and enable real-time decision making. This supercluster will position Canada as a global leader in the digital integration of supply chains, and this will allow machine learning to integrate into businesses of all sizes.

Scale AI will help design and execute high value-added collaborative projects between partners. It will enable innovators of any size to utilize the power of their local ecosystems fully: members will be encouraged to work closely together on innovation and R&D that will generate significant commercial opportunities and boost productivity.

The ultimate vision is a truly intelligent supply chain, adding value to all sectors of the economy through targeting five comprehensive business priorities:

ÉVOLUTIVITÉ	EFFICACITÉ	AGILITÉ	VISIBILITÉ	INTÉGRATION
↑ Capacity	↑ Sustainability	↑ Responsiveness	↑ Dependability	↑ Interoperability
↑ Throughput	↓ Cost	↑ Speed	↑ Traceability	↑ Partnerships
↑ Diverse talent	↓ Waste	↓ Time to market	↑ Security	↑ Intl. standards

## 3.1 Creating a competitive advantage for businesses of all sizes

Businesses face new challenges, as consumer needs are changing rapidly. Online business models are outpacing the traditional methods and introducing AI to this sector will allow companies to identify new opportunities and create longlasting value.

Data science and AI tools will help organizations improve performance by combining processes for analyzing highly targeted data and real-time decision-making. Core competitive advantages will be created for companies within the supercluster:

- **End-to-end integration:** this will be achieved through the merging of hardware and software and will provide full transparency on the supply chain material and track information streams
- **Agility:** the ability to anticipate and react to short term changes, model scenarios and take agile long-term decisions
- **Customer centricity:** provide alignment to the market and optimal proximity with the customer
- **Profit enablement:** provide the potential to access the best fit demand at the best possible profitability level

This opportunity unlocks tangible value for participating businesses, which includes faster revenue growth, especially for SMEs along with increased competitiveness. Studies by Boston Consulting Group (BCG) and The World Economic Forum (WEF) highlight the benefits from intelligent supply chains that adopting companies typically capture.

**Revenue:** typical 2-5% revenue increase, 2-10 p.p. service level increase, up to 80% lost sale reduction, up to 30% lead time reduction:

- Broader and more informed capture of revenue opportunities
- Better management of client-base and revenue growth
- Improved customer services, relationship and success management
- Increased profitability in peak/premium demand
- Faster delivery of products and services to clients

**Cost and operations:** typical 10-20% reduction in manufacturing, warehousing and distribution costs, 15-30% inventory reduction:

- Easier adaptation of supply chain to growth, scale-up, global expansion
- Lower costs in supply chain activities, broader operations and sales
- Increased percentage of utilization of manufacturing facilities
- Lower working capital (inventory, accounts payable)

**Sustainability:** typical 7-15% reduction of transport volumes, 15-20% GHG emissions reduction, 15-30% brand value increase, in addition to significant complementary cost reductions (10%+) and revenue upsides (5%+) :

- Shorter cycles, optimized routes to plant and to market
- Increased re-use, valorization of waste
- Transparency and security of flows
- Better view in ethical aspects of the global supply chain

## 3.2 Creating new business opportunities

Intelligent supply chains make companies more efficient, driving incremental business opportunities for enterprises across verticals, under the following patterns:

- **Increased capacity:** new concerted investment in intelligent supply chain will allow participants to eliminate inefficiencies faster, and increase capacity for the production of goods and services.
- **Increased speed and responsiveness:** faster supply chains enable better adaptation of companies in response to fluctuations of the demand, customization needs from customers, premium delivery models, etc. Customers are increasingly educated to demand premium products. This demand is often under-served and represents a revenue growth potential.

- **New products, business models and services:** the supercluster will allow for new specialized service enterprises to be launched and/or scaled-up to act as the vehicle by which innovation is transferred to businesses across the various element of the intelligent supply chain (e.g., data services, analytics, communications, IoT infrastructure, data security, and value-added services).
- **Increased value-added:** many commoditized types of services, such as truck transport, can be significantly enhanced by intelligent supply chains. Moving to premium offerings is an important opportunity for supply chain specialists as well as mobility providers.

## 3.3 Improving Canada's competitive ranking on the world stage

These benefits have a specific importance when it comes to international competition between firms and countries, which are engaged in the deep reconfiguration of the global value chains (GVC).

This applies to multiple types of competitions. Here are a few examples:

- **More efficient:** agile companies are more productive and cost-effective, and thereby better placed to win contracts within GVC
- **More responsive:** more agile companies can respond to unmet demand where no competitor can offer a product on time or customize their product to the individual customer
- **More visible:** companies with advanced supply chains are more visible to the global industrial ecosystem, e.g., their product catalogue is integrated with more distribution channels that have real-time visibility on their stocks

Becoming increasingly integrated with global value chains (GVC) is key for Canadian firms. GVC firms are performing better on average than others: they are more productive, pay higher wages and have more employees.

Canadian-controlled firms are transforming their way of participating in the global economy by adopting a diversified business model, which Export Development Canada (EDC) calls "integration trade."

Further, the supercluster's collaboration mechanisms will encourage global members with deep penetration in the marketplace to share opportunities and know-how with strategic partners. Multiple collaborative levers will be employed – from upstream to downstream supply chain:

- Round out or complement for missing capabilities in technology, business, regulation, finance
- Cross-company sourcing optimization with common suppliers
- Sharing of downstream logistics, distribution and retail channels
- Identification of potential new clients

Individual companies will more easily insert themselves into GVC:

- Firms from the verticals in focus will benefit from more effective supply chains to serve their clients abroad. They will do this by competing on cost, flexibility, responsiveness, expanding their delivery offering (i.e. same-day transatlantic delivery) and addressing untapped demand like customized products.
- Firms from the horizontals in focus will offer higher value products and services at lower costs. They will also broaden their reach, which will allow them to compete for international business opportunities and offer leading-edge services globally.

## 3.4 Supporting sustainable growth

Canada has an opportunity to rethink and re-invent its supply chain, to become a **resource-efficiency leader and gain a competitive advantage** in the global value chain by:

- Offering more premium products and services
- Ensuring more transparent and secure material flows, and a better control of risks related to supply chain disruptions
- Optimizing material flows and resource consumption
- Reducing waste and increasing sustainability
- Optimizing use of transportation
- Having better control over and improvement of security, customs, and land utilization
- Enhancing ability to deal with unexpected scenarios like natural disasters

## 3.5 Improving the strength of our talent pool

**Scale AI** will positively impact the Canadian labour market through several effects.

It will drive job creation by supporting the growth of multiple companies within the ecosystem:

- Industrial companies which increase their revenue by being more competitive, better responding to the demand and capturing new markets
- Technology companies powered by the increased collaboration in the ecosystem
- SMEs and startups supported in scaling-up
- Ancillary (supportive) jobs indirectly fueled by the ecosystem (typical multiplier of 2.5x)

It will enhance employees' skills in digital-enabled activities:

- Support post-secondary training in AI/data science and intelligent SC
- Training at the workplace for industry white and blue collars
- Targeted efforts to increase the representation of women and other underrepresented groups in AI/data science and supply chain education streams
- Canadian companies will have access to a diverse and talented workforce that is highly skilled in AI and digital technologies

It will help policy makers and key participants in the labour management sector better understand the trend and make better decisions to prepare the Canadian workforce to:

- Better assess, forecast and communicate the future needs of the industry
- Raise awareness of the opportunities of intelligent supply chain activities

## 3.6 Overview

**Scale AI** will create wealth for Canada via:

- Increased number of AI and technology-based entrepreneurship
- Faster growth of such companies
- High-paying job creation in technological development fields and industrial growth
- Upskilling of operational jobs in supply chain and industrial activities
- Competitive advantages for Canada-based employers
- Considerably improved efficiencies resulting in increased production output
- Increased tax revenues through improved company performance and jobs creation
- Brain gain through repatriation of talent and therefore increased tax revenues and increased disposable income in the economy
- Attraction of international firms to join the Canadian supercluster

We will ensure AI is developed and introduced inclusively. We will build an innovation ecosystem that promotes the sharing of information, ideas, and talent with Canada's SMEs as well as multinationals. We will create new high-value jobs – focused on human-in-the-loop technology, operations research and analysis and data flow optimization. We will train Canadians to meet a pressing need for digital skills. We will protect jobs throughout the economy, by providing Canadian firms with life-or-death competitive edges in time to market, cost of delivery, supply security and sustainability.

**Scale AI's** strategic priorities target the critical players of the ecosystem. By implementing them, we will provide a **crucial competitive advantage to Canada in the global economy** and improve the wealth of Canadians.

To deliver on these objectives, **Scale AI** will focus on five Programs Streams, which serve as the basis of **Scale AI**'s programs and activities.

### Five program streams

				
For supply chain operators	For supply chain, AI, digital providers	For SMEs/startups	For the workforce	For Canada
<ul style="list-style-type: none"> <li>→ Boost revenues</li> <li>→ Improve market responsiveness</li> <li>→ Drive step-change in competitiveness and productivity of Canadian companies</li> <li>→ Help Canadian businesses be more resilient to technology changes and supply chain disruptions</li> <li>→ Foster game-changing integration in value chains</li> </ul>	<ul style="list-style-type: none"> <li>→ Advance Canada's tech leadership</li> <li>→ Grow the world's best applied AI services providers</li> <li>→ Expand business opportunities and ecosystem partnerships</li> <li>→ Export intelligent supply chain expertise</li> <li>→ Foster access to large amounts of data for superior tech development</li> </ul>	<ul style="list-style-type: none"> <li>→ Generate new companies</li> <li>→ Accelerate the growth of successful entrepreneurs</li> <li>→ Growth the next AI unicorns</li> <li>→ Help monetize, industrialize, scale-up tech solutions</li> <li>→ Connect SMEs with potential clients, investors</li> <li>→ Integrate SMEs in local and global value chains</li> </ul>	<ul style="list-style-type: none"> <li>→ Provide new digital and AI skills to Canadians</li> <li>→ Design world-class training for college &amp; university students</li> <li>→ Contribute to reskilling of Canada's existing industrial workforce</li> <li>→ Develop best-in-class intelligent supply chain curriculum</li> <li>→ Foster diversity and inclusion of visible minorities</li> </ul>	<ul style="list-style-type: none"> <li>→ Increase business R&amp;D expenditures</li> <li>→ Enhance Canada's position as a global hub for applied AI</li> <li>→ Create new, highvalue jobs</li> <li>→ Become a magnet to talent &amp; investment</li> <li>→ Better position Canada as a trading nation on high-value activities</li> <li>→ Make Canada's economy more sustainable</li> </ul>

**ADOPTION OF AI-POWERED SUPPLY CHAIN**

→ Promote the diffusion of AI-powered supply chain solutions throughout the industry sectors in focus

**COMMERCIALIZATION OF AI-POWERED SUPPLY CHAIN SOLUTIONS**

→ Support tech and solution providers by improving and scaling their core AI offerings

**SME AI SCALE-UP SUPPORT**

→ Support the growth of SMEs and startups and help grow AI global champions

**CURRENT AND FUTURE WORKFORCE DEVELOPMENT IN AI**

→ Develop the skills and diversity of the current and future workforce in AI

**COLLABORATION DEVELOPMENT**

→ Facilitate collaboration and maximize synergies in the ecosystem

# 4. Scale AI's Program Streams

## 4.1 Adoption of AI-powered supply chain

### OPPORTUNITY AND CHALLENGE

**Scale AI** aims to bring the ecosystem's capabilities in AI and intelligent supply chain from the lab to the field. We want to ensure a deeper penetration of technologies by industrial users. The supercluster will address this opportunity from the perspectives of both the providers and the adopters.

On the adopters' side, the integration of AI-powered solutions is a key enabler to revenue growth and productivity. But meaningful efforts are necessary to adapt operations and manage the change.

Most organizations lack the capabilities to evaluate, build and deploy AI solutions. We want to change this by:

- Providing expert support to identify, focus on and deliver best-fit use cases from the library of possible applications
- Communicating to align multiple internal stakeholders towards a common goal
- Revamping operational processes as well as systems, tools and procedures
- Upskilling the workforce (implementers and users of the technology)

On the providers' side, deeper adoption of AI technologies is a major enabler for sustainable growth and development of business in Canada. There are several opportunities to support the diffusion of advanced solutions and technologies in the ecosystem by supporting their adoption by industry users:

- A number of ready-for-use technological and business solutions exist on the market
- Some solutions need to be adapted to different industry sectors or industrial contexts to expand their reach (e.g., from discrete to process manufacturing)
- The technology solutions often require to be complemented with a proven approach to address the business and change management requirements of the industry

Several applications have been identified by the members as frequent observed business challenges and proven effective areas for AI-powered solutions. This includes the following: demand forecasting, inventory optimization, automated sourcing, automated warehousing, scheduling and predictive disruption analysis, preventive maintenance, real-time data integration and traceability, risk management.

Participating adopting organizations, large and small, will have the opportunity to leverage the digitization of their operations by implementing intelligent supply chain applications with the adequate guidance and access to technology from best-in-class players, including academic expertise, from the membership.

## 4.2 Commercialization of AI-powered supply chain solutions

### OPPORTUNITY AND CHALLENGE

Canada shows strength in its fundamental research as well as its entrepreneurial ambitions. However, Canadian technology providers face increasingly high barriers to success as they move downstream the cycle: from development, application, and industrialization, down to expansion of the product or service.

“As a small, open economy, Canada is often an attractive place for companies to conduct R&D (or to procure its products such as patents and talented innovators). However, it is too often a less attractive place for developing and commercializing products, and growing companies with global reach. The end result is a loss of economic benefits and opportunities for Canada.”<sup>5</sup>

More needs to be done for Canadian innovators, large and small, who develop new solutions and sell them as their core business. A great deal of Canadian providers of solutions, software, high-tech equipment, etc., will benefit from enhanced conditions to improve their commercial offering and make it more successful on the market.

Furthermore, the scale of the ecosystem and the co-funding of projects will allow decreasing innovation costs. The investments, projects, and activities of **Scale AI** will help participants adapt AI and AI-powered supply chain solutions quicker and scale them faster, improving competitiveness and productivity on a global scale.

Finally, **Scale AI** provides a key opportunity to engage a critical mass of players, including academic researchers, around a shared view of the future of intelligent supply chains and generate synergies so as Canada we play above our weight – for instance by fostering interoperability between solutions developed.

### PROGRAM DEFINITION

The program’s objective is **to develop and scale next-generation, AI-powered supply chain solutions**. **Scale AI** will approve projects to strengthen the commercial capabilities and value of innovative products and services to incent and reward early innovators and early adopters in investing and implementing nascent solutions.

**Scale AI** will achieve this objective by supporting private-sector led commercialization projects involving notably:

- Joint innovation aiming to augment, improve, optimize the products/services of one or more of the participants
- Collaboration aiming to drive standardization and interoperability between offering of different players, e.g., software compatibility, data curation, data access
- Development of prototypes, minimum viable products, proof of concepts
- Demonstration and other forms of promotion of new product/service

<sup>5</sup>Expert Panel on the State of Science and Technology and Industrial Research and Development in Canada, “Competing in a global innovation economy : the current state of R&D in Canada,” Council of Canadian Academies, [http://new-report.scienceadvice.ca/assets/report/Competing\\_in\\_a\\_Global\\_Innovation\\_Economy\\_FullReport\\_EN.pdf](http://new-report.scienceadvice.ca/assets/report/Competing_in_a_Global_Innovation_Economy_FullReport_EN.pdf)

- Industrialization and capacity increase of business and technology solutions/frameworks
- Go-to-market plan implementation, including commercial and ecosystem-level partnership developments
- Initiatives aiming to promote the offering of players of the supercluster and the visibility and credibility

Technologies and solutions in focus are as outlined in **Scale AI**'s technology roadmap:

- Improve and scale existing supply chain solutions developed by members to drive immediate benefits
- Invest in next-generation AI-powered supply chain solutions and building blocks to create a long term, sustainable competitive advantage for Canadian firms

The commercialization program will drive innovation and create a long-term, sustainable competitive advantage for Canadian firms by making Canada a leader in developing and applying AI-powered supply chain solutions.

## 4.3 SME AI scale-up support

### OPPORTUNITY AND CHALLENGE

High growth companies are major drivers of Canada's long-term prosperity. They represent approximately 4% of Canadian businesses with less than 10 employees and 40% of new jobs. These firms face distinctive challenges when expanding globally.

We need to augment our support to these companies to accelerate growth leveraging technology and collaboration. The focus on supply chains is a most effective lever in this regard, due to the high demand from the industry and the strong capabilities of technology players in the Canadian ecosystem.

Through **Scale AI**, the project partnerships created between developers and adopters will allow the acceleration of growth of successful entrepreneurs and startups, attract investments and make ventures more successful.

Further, specific initiatives are being put in place to provide Canadian SMEs with concrete and business-focused support on their scale up journey:

- Promote partnerships between members of all sizes as well as academia to create significant commercial opportunities for SMEs
- Accompany ventures on their growth curve through a range of programs and supports
- Enable the creation, protection and monetization of valuable IP that will favour startups and SMEs growth

## PROGRAM DEFINITION

The **objective of the program is to provide growth and scale-up support services** to smaller companies focused on AI and intelligent supply chains products and services. The goal is to support a wide number of high-potential startups and SMEs in accelerating their growth, and to provide a ramp for global leaders to emerge. The approach is end-to-end and will address a range of company sizes with relevant support models.

We will accelerate the generation and early growth of new companies by augmenting the magnitude and/or geographic footprint of incubators and accelerators, including the Creative Destruction Lab, NextAI or Velocity.

We will attract more ventures as we go and will provide connections with seed and growth investors that can bring added value to the scale-ups.

**Scale AI** will provide startups and SMEs tools with access to different programs and supports, such as:

- Incubation, coaching and mentorship to founders and management teams on technology, business and overall development topics
- Help to identify pertinent areas where to apply the technology, i.e., business challenge, sectors, types of client companies
- Facilitation of access to customers and enablement for productive and win-win relationships between providers and adopters
- Mentorship on IP management and go-to-market strategies
- Opportunities to expand the footprint of their products and services, e.g., across sectors, geographies

As part of this program, **Scale AI** will coordinate engagements between members of all sizes through a range of events and activities in addition to individual coaching to specific SMEs. Support will also be provided by increasing the throughput of the scale-up support organizations, e.g., add new, focused cohorts to accelerator's plan, support footprint development in

## NEW CITIES OF SUCH ORGANIZATIONS.

Matching the needs of large firms and smaller firms is an essential component of this program. As an exemplary endeavour to achieve this objective, the supercluster will work with industrial members of all sizes to identify key supply chain challenges that could benefit from AI-powered solutions, define a clear opportunity to be addressed, help startups/SMEs adapt their product and select the best matches. The supercluster and incubators then organize and facilitate a dedicated, small-scale connection event to kick-start collaboration.

## 4.4 Current and future workforce development in AI

### OPPORTUNITY AND CHALLENGE

A critical part of **Scale AI**'s mission is to develop future talent to generate and use AI technologies, while simultaneously making the workplace more diverse. This investment will lay the foundation for a more innovative, competitive and inclusive Canadian economy. **Scale AI** sees talent as a prominent lever to enable the development of the Canadian AI ecosystem and the transformation of our industry.

**Canada has strong assets in AI talent:** it punches well above its weight globally on the quality and quantity of AI scientists in machine learning, operations research, and data science.

But significant challenges remain in a global context of ever-growing demand and competition for talent. We are in short supply across the AI value chain: from fundamental and applied research to commercialization by the technology sector and adoption by the diverse industrial sectors.

Furthermore, advanced technologies are going to impact skills and roles in the industry – it is essential to develop the workforce's digital literacy to allow real use of AI-powered technologies.

**Scale AI**'s talent development program will address both the industrial workforce as well as the future pipeline of talents coming out of academia. We will then bridge the connection between the two via co-ops and reverse co-ops.

### PROGRAM DEFINITION

**Scale AI**'s strategy focuses on developing Canada's talent at the crossroads of AI and supply chain management, in complementary ways - investing in new programs and expanding on what works.

Potential programs would focus on the workforce across multiple industries and with various skill levels.

**Upskill professionals** to enable the supercluster's projects. Increase knowledge in AI, IoT and intelligent supply chain for members, firms and employees and act as connecting point for activities and talent between industry and academia, e.g.:

- Implement flexible training programs involving seminars, online courses, etc.
- Develop reverse co-ops as part of projects, or on an ongoing basis, for industry professionals to collaborate with scientists and experts on the applications of AI and related technologies to intelligent supply chain.

**Grow the awareness** of the broader industrial workforce. Introduce a series of online and live training sessions and develop a best-in-class curriculum addressing ICT and supply chain technicians and leaders for widespread dissemination, e.g.:

- Train/raise awareness of supply chain practitioners through case studies, train-the-trainer programming, boot-camp certification courses, webinars, videos, conferences, in-house or local events
- Develop supply chain savvy ICT workers through a new two-day crash course on supply chain management led by expert bodies collaborating with the industry
- Provide awareness training to senior leaders from supply chain, technology, general management, and other roles, e.g.: executive round-tables

**Fuel the future growth of the talent pool.** Increase the output of academic and industry-academic programs for high-demand talents, e.g.:

- Boost industrial internships and high-demand program capacity (co-ops)
- Support pre-professional training programs at colleges and CEGEPs in collaboration with the industry
- Support interdisciplinary programs led by academia collaborating with industry and enablers, for undergraduates and Masters students
- Create a directory of co-op positions to ensure that members of the supercluster are introduced to talent well in advance of graduation
- Develop optional specializations for interdisciplinary undergraduates addressing AI, data analytics and intelligent supply chain
- Augment collaborative research Masters and Ph.D. students with a focus on applied AI and intelligent supply chain management
- Create new data analytics, AI and intelligent supply chain scholarships targeting Masters and Ph.D. students

**Leverage diversity and increase equity.** Increase the participation of the four underrepresented groups in scientific, AI and supply chain studies as well as professional activities through academic, industry, and outreach programs, e.g.:

- Expand best-in-class STEM outreach programming for underrepresented groups
- Create scholarships for underrepresented groups in ICT and supply chain management, targeting undergraduates identifying as women, visible minorities, persons with disabilities, or First Nations Peoples
- Introduce dedicated AI Research Chairs for Women to increase training capacity and boost equity in academia
- Support partner organizations' research and activities related to outreach in science and advanced industrial operations training

## 4.5 Collaboration development

Scale AI will actively work to develop and engage the ecosystem to maximize the socio-economic value creation and sustain its impact in the long run.

Priorities have been identified to develop a thriving ecosystem by strengthening networks and relationships between the various participating organizations, enable and deepen collaboration over time, and provide the required infrastructure to that effect.

### MEMBERSHIP GROWTH

“Without explicit strategies in place to support the development of targeted clusters, the effectiveness of cluster-based economic development plans can be compromised.”<sup>6</sup>

**Scale AI**'s membership will grow over time to attract members with the best capabilities on the market and capture the largest volumes of value across industrial sectors.

**Scale AI** intends to expand its membership and create maximum impact on the ecosystem through:

- Direct applications by potential candidates
- Recommendations by existing members (e.g., as part of the setup of a project)
- Outreach by the **Scale AI** team

**Scale AI** will make sure that new members are aligned with the supercluster's mission, its collaborative framework and are committed to developing the benefits for Canada. New members will contribute to the success and prosperity of the ecosystem.

### COLLABORATION ENGAGEMENTS

The **Scale AI** team will engage **with members on an ongoing basis** to help facilitate discovery and communication between partners for connection-making, project development, etc.

We will establish a set of working groups dedicated to topics identified by our team and participating organizations. These will focus on common-purpose topics and include, business (e.g.: demand forecasting in retail), technical endeavours (e.g.: data nomenclatures simplification), ecosystem synergies development (e.g.: data curation and exchange) and large-scale projects (e.g.: seaway digital integration). The goal is to standardize our approach and align on strategies with a number of stakeholders.

Regular events will bring members together creating a forum for collaboration and the opportunity to discuss how to improve the operations of the supercluster and for the team to provide updates on **Scale AI**'s roadmap.

<sup>6</sup> JP Morgan Chase & Co, “Accelerating Cluster Growth : A Playbook for City Leaders,” June 2015

## ONLINE COLLABORATION PLATFORM

**Scale AI** will help members better understand existing capabilities within the membership and identify opportunities for collaboration. To that effect, we will implement a collaboration platform with two key components:

### Directory of Partners

The platform will include a directory, accessible only to members, with the corporate profile of participating organizations, relevant contact information, their capabilities and areas of expertise, as well as areas for potential collaboration (e.g.: topic of interest, proposed project looking for specific skills, opening of a project to voluntary participants).

### Resource Centre

The platform will also provide access to the key elements of **Scale AI**'s collaboration framework, e.g., program guidelines and governance, project submission templates, project evaluation criteria and project agreements. It will also include a running list of projects with their corresponding status (ongoing, finished, etc.), and post-mortem analysis. This will allow for members to share best practices on collaboration, business and technical matters.

## SCIENTIFIC COMMITTEE

**Scale AI** will implement a Scientific Committee comprised of world-class researchers from the industry, Canadian research institutions and international organizations.

The purpose of the Scientific Committee is **to provide Scale AI with foresight and expertise** on the major scientific opportunities and challenges of the supercluster, and to ensure it maintains global credibility.

The Scientific Committee will be closely connected to our daily operations. Its members can be referred by our existing partners and/or **Scale AI**'s team and will provide input on project definition, evaluation, as well as execution on collaborative projects.

## GLOBAL ADVANTAGE ENGAGEMENTS

**Scale AI** will aim to connect the members and its strategy with global counterparts. We will develop new partnerships with best-in-class ecosystem players. This includes individual firms, supply chain hubs, professional associations, academic institutions, think tanks, governments and international organizations, across the U.S., Europe and Asia.

To attain this, **Scale AI** will pursue the following:

- Supercluster branding and promotion
- Connecting member SMEs to global value chains
- Alignment at a global scale on relevant technical and business standards
- Support of protected international flows of high-value data, e.g., e-commerce

- Development of thought leadership on the next-generation supply chain
- Attraction of foreign investments

## INTELLECTUAL PROPERTY (IP) STRATEGY

“In today’s global economy, many of the growth industries are IP-rich and IP-intensive. [...] Worldwide IP applications have grown nearly 70% in 10 years to more than 11 million in 2015, while overall global IP rights applications by Canadians grew by 35% from 2005 to 2014.”<sup>7</sup>

IP, including data, is a major asset for the majority of **Scale AI**’s members. It is the main revenue driver for technology companies, and for industry adopters it is a key competitive advantage. As an ecosystem developer, **Scale AI**’s role is to provide members with the opportunity to generate additional value through IP while simultaneously ensuring the appropriate safeguards are in place e.g.: IP ownership, protection, confidentiality.

Various perspectives have informed **Scale AI**’s IP strategy:

- Competitive strategies and the value attached to the monetization of IP are at the core of **Scale AI**’s strategy
- **Scale AI** aims to support the generation of new IP with projects, and grow the value of existing IP through commercial avenues and partnerships
- **Scale AI**’s ecosystem enables the creation of valuable IP that will foster the development and growth of startups, scale-ups and anchor companies
- Members will be encouraged to build market exclusivity through IP, allowing them to open and protect new markets for intelligent supply chain products and services
- Our members will have the opportunity to recognize synergies amongst themselves based on IP, e.g.: access to data of common interest, building on another player’s newly generated IP for additional value creation
- To capitalize on these synergies, parties must view the opportunity as mutually beneficial; member flexibility will be key in adapting to a variety of situations around IP
- It is core to the supercluster’s mission that IP generated through projects primarily benefits the Canadian economy and not those of other countries
- Cybersecurity concerns are paramount and will be defined and evaluated during the project development phase

**Scale AI will strive to reduce IP-related barriers to effective collaboration in the industry**, helping members to generate more valuable IP.

<sup>7</sup>Innovation, Science and Economic Development Canada (ISED), “Canadian Intellectual Property Office Five-Year Business Strategy 2017–2022,” [https://www.ic.gc.ca/eic/site-ci-pointernet-internetopic.nsf/vwapj/StrategieAffaires-BusinessStrategy20172022-eng.pdf/\\$file/StrategieAffaires-BusinessStrategy20172022-eng.pdf](https://www.ic.gc.ca/eic/site-ci-pointernet-internetopic.nsf/vwapj/StrategieAffaires-BusinessStrategy20172022-eng.pdf/$file/StrategieAffaires-BusinessStrategy20172022-eng.pdf)

To that effect, **Scale AI** has developed a set of operating guidelines that supports the definition and execution of effective collaborative projects, protects the interests of the industry, and provides opportunities for the development of IP and data synergies between players:

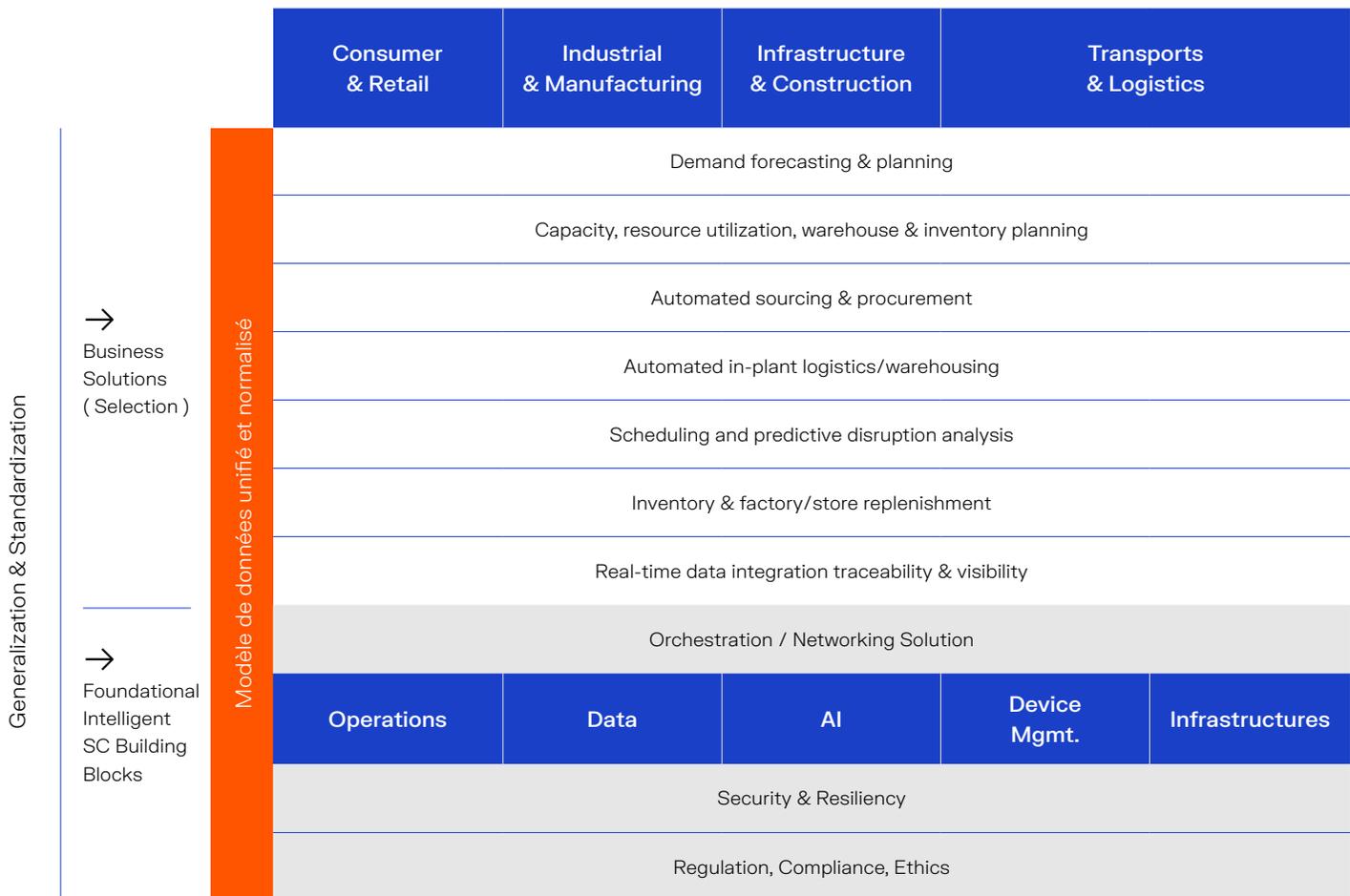
- Systemize best-practices for development and sharing of winning IP
- Define clear guidelines for IP creation and management
- Design an IP framework to include incentives for all stakeholders to contribute to better overall IP value
- Accelerate agreements between members around IP
- Unlock collaborative development, to avoid friction around IP
- Increase quantity and quality of overall IP generated
- Share costs of IP monitoring and enforcement across multiple players
- Leverage IP created by research institutions
- Create a specific approach to help SMEs gain better access to IP developed by members of the supercluster
- Create trust amongst members of the supercluster by providing clear rules of engagement and key IP and data protection and security mechanism

# 5. Scale AI's Technology Priorities

## 5.1 Overview

Scale AI will focus on supply chain challenges that have restricted growth and productivity for decades: demand planning/ forecasting, procurement, inventory management, warehouse optimization, pricing and sustainability.

These business solutions will integrate emerging technologies such as AI, blockchain, IoT, mobility, cloud, robotics and big data. This will enable real-time holistic decision making to effectively manage uncertainty and risk. Scale AI will also support the development of foundational building blocks of the next-generation supply chain, at the crossroads of a number of technologies and applications.



## 5.2 Responding to business problems

Members of the ecosystem face similar challenges around competitiveness and productivity:

- Commercializing and scaling AI innovation
- Demand responsiveness
- Augmenting resource utilization and output
- Increasing the quality of business decisions

In response to these challenges, **Scale AI will adopt and scale existing supply chain solutions** implemented by members to drive immediate benefits. This will result in facilitated connections between supply chain users and supply chain / AI / digital providers to enable accelerated adoption of existing solutions.

### Examples of business solutions

	<p><b>Demand forecasting and planning</b></p> <p>Use AI/Machine Learning (ML) to better predict changes in demand (or demand for new goods and services). Match capacity to expected production requirements.</p>	<p><b>Expected gains</b></p> <p>Minimize the discrepancies between supply and demand throughout the supply chain. Improve revenue, margins and customer service.</p>
	<p><b>Warehouse and inventory planning</b></p> <p>Improve product flow by leveraging optimization techniques combined with robotics to enable more efficient warehouse operations.</p>	<p><b>Expected gains</b></p> <p>Optimization of merchandise flow to align with inbound and outbound schedules, resulting in decreased carried inventory.</p>
	<p><b>Automated in-plant logistics</b></p> <p>Develop robotic actuators and supporting systems (vision recognition, motor control, etc.) to automate the handling of items of varying dimensions.</p>	<p><b>Expected gains</b></p> <p>Time savings on the handling of products of varying sizes and risk minimization.</p>
	<p><b>Scheduling / predictive disruption analysis</b></p> <p>Leverage AI technology for maintenance to better predict when machines and other mechanical assets will fail or require maintenance as well as identify needed resources.</p>	<p><b>Expected gains</b></p> <p>Optimization of maintenance and repair schedules to decrease downtime impacts on supply chain productivity and effectiveness.</p>

## ENABLING BETTER RESPONSIVENESS TO DEMAND

**Demand responsiveness can unlock profitability and sustained economic advantages.** Rapidly responding to changes in demand, whether due to new market penetration or uptake in products or service, has a major impact on a businesses revenues and costs. This requires continuously adapting to changing customer behaviours and expectations, and combined with the accelerated advance of technology, confounds designers, demand planners, manufacturers and their supply chain partners.

The ultimate goal is to to **foresee the changes in demand and effectively adapt** to either capture the growth from certain markets or exit them.

In order to develop accelerated demand responsiveness, companies need to have tightly integrated supply chains that leverage advanced analytics and predictive capabilities. Innovations in demand forecasting at the SKU level, inventory optimization and the automation of reordering have made competitive threats from foreign firms all too real. Canadian companies need to rapidly adopt these capabilities in order to compete and surpass innovative competitors from around the world.

## 5.3 Designing the building blocks of the next-generation supply chain

**Scale AI** targets the development, industrialization and expansion of a range of key building blocks created by multiple members of the supercluster. The building blocks aim to:

- Leverage the specific strengths of the supercluster members
- Maximize the synergies within the ecosystem

They will enable next-generation supply chain technologies, to specify and address a critical ecosystem-level challenge. Important features of the building blocks include:

- A focus on the distributed nature of future intelligent supply chain
- Compatibility and interoperability across building blocks wherever possible to enable integration
- Increased resiliency of systems with dynamic configurability

The building blocks will be defined by the supercluster members in cooperation with the supercluster team and be gradually implemented over the course of the programs.

## EXAMPLE BUILDING BLOCKS

	<b>OPERATIONS</b>	
	<p>Enhance partners' ability to automate supply chain management in real-time and effectively deal with uncertainty.</p>	
	<p><b>How?</b>                  Improve visibility in demand planning and forecasting, inventory management, transportation, warehouse and product flow optimization, pricing, sustainability etc.</p>	
	<b>PROJECT EXAMPLE</b>	
<b>Services marketplace and automated procurement</b>	<b>Expected gains</b>	
<ul style="list-style-type: none"> <li>→ Develop an AI/ML-based marketplace, sourcing and sharing platform that evaluates suppliers and connects them to buyers.</li> <li>→ Enable participants to also source/share capacity and assets to maximize utilization throughout the network.</li> </ul>	<ul style="list-style-type: none"> <li>→ Connect buyers and sellers in an optimized and efficient manner based on historical patterns, current needs, cost, and other key factors.</li> </ul>	
	<b>DATA</b>	
	<p>Provide integrated solutions that accelerate the digitization of assets, processes, and activities as well as the storing and sharing of data among partners.</p>	
	<p><b>How?</b>                  Capture data with tools such as natural language interfaces or computer vision systems.</p>	
	<b>PROJECT EXAMPLE</b>	
<b>Secure data exchange for integrated supply chain planning and execution</b>	<b>Expected gains</b>	
<ul style="list-style-type: none"> <li>→ Develop a data exchange/clearinghouse delivery platform that provides authorized access to integrated, unstructured, usable data sets aggregated from multiple partners and third-party sources.</li> </ul>	<ul style="list-style-type: none"> <li>→ Securely collect, store and share operational/ transactional information among participants up and down the supply chain.</li> </ul>	

	<b>DEVICE MANAGEMENT AND AI INTEGRATION</b>	
	<p>Transform legacy supply chain, reduce inefficiencies and increase competitiveness.</p>	
	<p><b>How?</b> Integrate Internet of Things (IoT), robotics, mobility and communications solutions in the supply chain.</p>	
	<b>PROJECT EXAMPLE</b>	
<b>Industrial and Mobile IoT</b>	<b>Expected gains</b>	
<p>→ Leverage AI/ML to develop sustainable, dependable solutions that cost-effectively track and monitor the status of goods and assets throughout the supply chain and across multiple jurisdictions.</p>	<p>→ More visibility on the status of large volumes of assets/products in highly variable environments.</p>	
	<b>INFRASTRUCTURE</b>	
	<p>Bolster integrity, availability, visibility and security to ensure traceability, and dependability across the supply chain.</p>	
	<p><b>How?</b> Leverage AI, cloud, IoT, blockchain; new platforms will confirm origin/source, composition and chain of custody as goods are produced, assembled, reconfigured and handled by multiple trusted/untrusted parties, and ensure reliable information flow.</p>	
	<b>PROJECT EXAMPLE</b>	
<b>Risk and compliance</b>	<b>Expected gains</b>	
<p>→ Develop AI/ML-based, real-time solutions that can better process new types of structured and unstructured data sources. This will result in more efficient risk and compliance management on a real-time and ongoing basis.</p>	<p>→ Track and maintain compliance while taking into consideration complex and changing international laws, regulations, industry standards, and supply chain legal contracts.</p>	

## ENABLING BETTER RESPONSIVENESS TO DEMAND

Solutions that accelerate the digitization of assets, processes and activities will allow for real-time generation of data which will be used for integrated supply chain planning and execution.

The [curation of the relevant supply chain data is a key avenue for Scale AI](#). There are several different technical models, many of which maintain the ownership of the source of data and allow for differentiated access management. Anonymization of data and privileged access management are appropriate secure proprietary advantages for supercluster members.

Such data exchange/clearing house (real-time and batch) improve supply chain responsiveness by providing authorized access to integrated, usable data sets aggregated from multiple partners and third-party sources throughout the supply chain network. It will enable adopters who participate in different segments of the supply chain to better collaborate and coordinate efforts, so that the network operates in a more integrated fashion and allows service providers to improve the value of their products and services.

Additionally, freely available and licensed training data sets will accelerate the development and testing of new AI applications.

# 5.4 Additional opportunities

## INTEGRATION OPPORTUNITIES

The solutions and building blocks have a significant potential to be developed for and/or deployed in, large scale sub-clusters that deal with a critical mass of players and can profoundly impact Canada's economy. These include:

- Integration of rail and marine transport systems
- End-to-end seaway supply chain operations management, from the Great Lakes to the St. Lawrence River and Atlantic Ocean
- Food safety and security management systems
- Circular economy implementation in a manufacturing environment

Thematic working groups will enable the involvement of the relevant stakeholders to prioritize and co-design projects. The working groups will also enable **Scale AI** to lead an inclusive effort to drive towards more homogeneity and interoperability in the intelligent supply chain landscape, including:

- Aligned language across players and sectors
- Similar inputs and outputs of tech solutions and operational processes
- Standardized data nomenclatures
- Connections with global systems, standards, and compliance requirements

## → SUSTAINABILITY OPPORTUNITIES

Additional opportunities will emerge around the **shared economy** trend, related to high-value industrial assets and commercial real estate (warehousing, etc.) or transportation. As the value chain shifts depending on factors such as cyclicity, seasonality and other environmental and economic value, dynamically optimized and modular supply chains will allow for the creation of new products and services related to time-based and collaborative optimization.

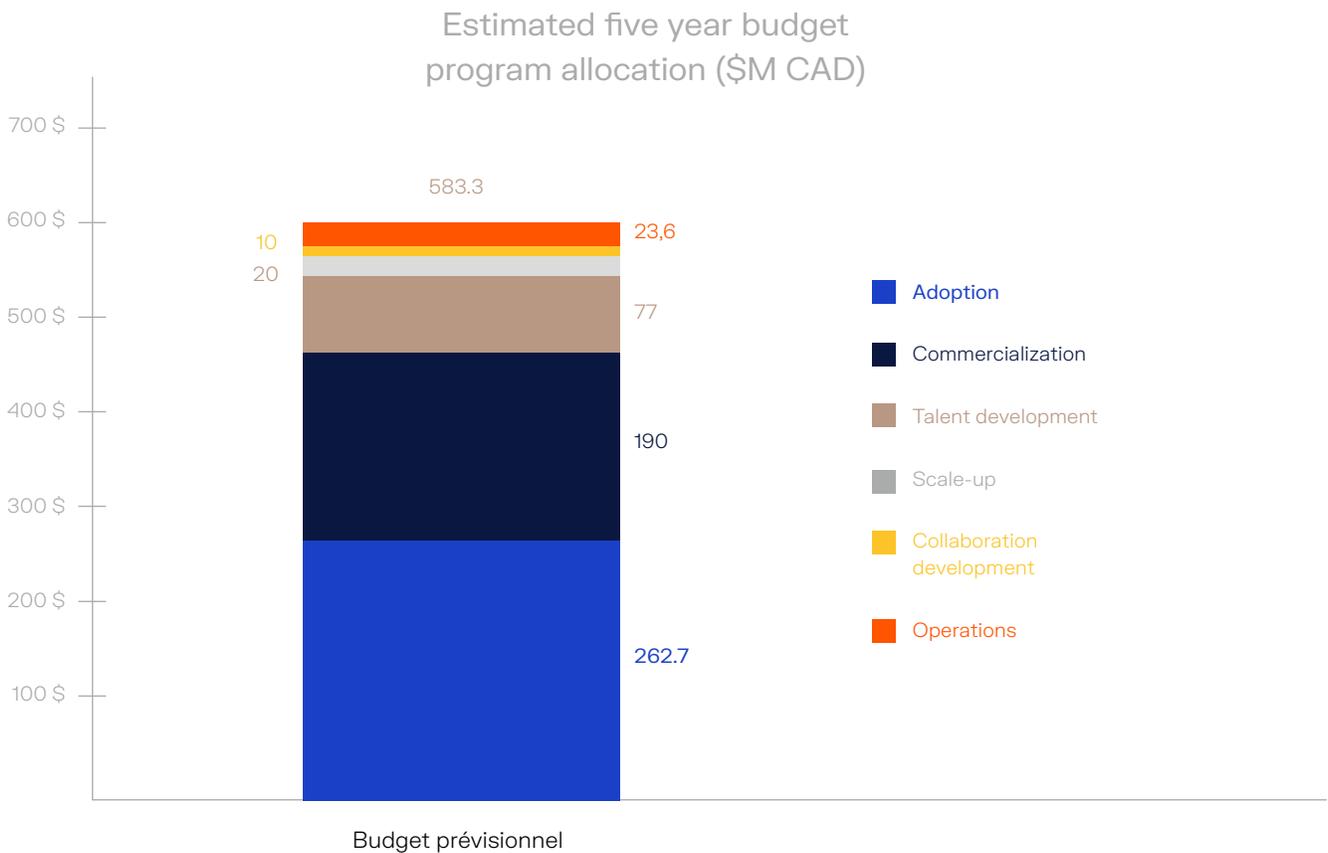
Intelligent supply chain will help Canadian enterprises get to the **next level of sustainable industrial transformation**. **Scale AI** will give Canada an opportunity to rethink and re-invent its supply chain, to become a resource-efficiency leader and gain a competitive advantage in the global value chain:

- Offering more premium products and services
- Ensuring more transparent and secure material flows, and a better control of risks related to supply chain disruptions
- Optimized material flows and resource consumption
- Reduced waste, increased recycling
- Optimized use and modalities of transportation
- Better control and improvement of security, customs, and land utilization
- Enhanced ability to deal with unexpected natural and other disasters

# 6. Scale AI's Estimated Budgets

The Government of Canada's contribution amounts to \$230 million over five years from April 1, 2018 until March 31, 2023. This amount will at least double with industry funding (including a small portion as membership fees); an additional funding of \$30 million has been granted by the Government of Québec, leading to an expected \$583 million total spending until the end of fiscal year 2022-2023.

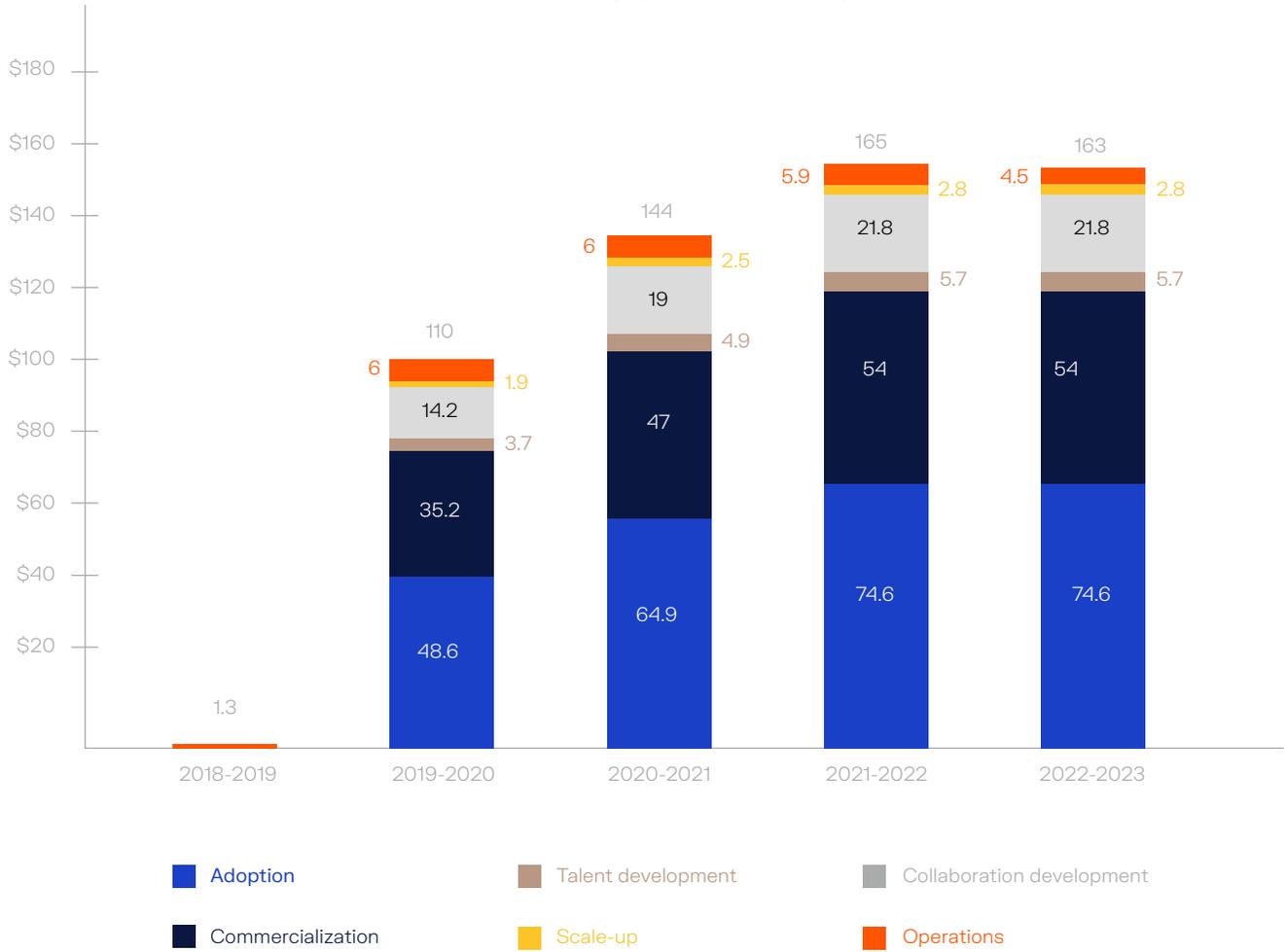
To deliver on the objectives of the supercluster, the following preliminary allocation of the investment budget across activities and programs is as follows:



Scale AI's strategy is deeply incremental and involves the development of a new form of collaboration in the ecosystem. The focus on leading-edge innovation leveraging advanced technologies such as AI is putting the ecosystem players on a learning curve which Scale AI will help to enable and accelerate.

The time profile of the budgeted investments reflects the ramp up of collaboration and capabilities. **Scale AI** is planning to progressively increase its annual investments in the first two years, and reach full throttle in the third year (2020-2021):

Estimated five year budget program allocation broken down by year (\$M CAD)



# 7. Scale AI's Key Success Indicators

**Scale AI** is targeting massive value creation for Canadian firms, innovation ecosystems, and citizens. To do so, it is building a new, truly incremental collaborative network:

- Connecting users and providers of AI, large and small firms, private sector and academic institutions
- Concentrating on the application of AI and adjacent technologies to address concrete business opportunities in supply chain management
- Supporting a holistic agenda with initiatives at different scales (enterprise, workforce, whole ecosystem)
- Scale up SMEs by providing resources for growth and increased supply chain links among key actors to enhance access to global markets for Canadian SMEs with technology capabilities.
- Facilitate IP dissemination amongst members to support innovation and accelerate SMEs scale up

**Scale AI** targets near-term benefits as it catalyzes innovation from day one. But **Scale AI** involves embarking on a longer journey that starts with implementing an effective collaboration and will bring increasingly large benefits as it grows.

## WHAT SUCCESS WILL LOOK LIKE

**Scale AI** will have been successful if it achieves the following over the next few years.

### By March 2020:

- A well-functioning collaboration between members: they have deep visibility into the competencies of the ecosystem's players, feel secure to engage with other members under the collaboration framework of the supercluster and have built fruitful connections with other members.
- Effective series of projects completed: the members have successfully implemented a range of projects across all the five strategic programs (adoption, commercialization, SME scale-up support, talent development) and generated concrete benefits.
- A dynamic membership: the membership attracts an increasing number of participants including best-in-class technology and industry participants and other ecosystem enablers.

### By March 2023:

- Major improvement in the adoption rate of AI technologies in industrial supply chains, with a focus on SMEs: most members have significantly increased their maturity and moved along the ladder of AI-powered supply chain practice – leaders have become global best-in-class, followers have become leaders.
- Several major commercialization success stories: a number of SMEs and larger firms have developed industrialized leading solutions, and achieved revenue growth on global markets.
- Next-generation supply chain build-up: several foundational building blocks of the next gen supply chain technologies and solutions have been developed and made accessible to the industry, e.g.: curated data exchange platforms, supply chain information standards, technological connections to global supply chain hubs.
- SME scale-up breakthroughs: majority of SMEs participating in the supercluster drastically accelerated their growth profile; several startups and SMEs scaled up to over \$100 million annual revenues.
- Boosted talent pool: hundreds of additional advanced degrees in AI/supply chain trained and recruited by Canadian ecosystem firms; thousands of industry professionals, especially in SMEs, trained to deliver and utilize AI-powered supply chain solutions.

### By 2028:

- Over \$16.5 billion GDP impact generated in Canada
- Over 16,000 jobs generated in Canada
- Sustained activity of the **Scale AI** supercluster, with collaborative framework expanded beyond original scope:
- Additional sectors
- Additional business functions, e.g.: marketing and sales, manufacturing

## MEASUREMENT

Metrics will be employed to track the activity carried out by the supercluster and its members, as well as the outcomes generated. The table below provides a high-level of the KPIs that will be used. They may be disclosed/updated/refined as the programs grow.

RÉSULTATS attendus d'ici la fin de 2022-2023 d'IRC	
RÉSULTATS	<p><b>Général</b></p> <ul style="list-style-type: none"> <li>→ Plus de 16 000 emplois (d'ici 2028) créés grâce aux projets ou au développement de l'écosystème de la supergrappe.</li> <li>→ 16,5 G\$ de retombés sur le PIB d'ici 2028</li> </ul>
	<p><b>Programme de croissance</b></p> <ul style="list-style-type: none"> <li>→ Plus de 100 entreprises en démarrages membres avec une croissance de revenus de plus de 2, 5, 10 et 20 M\$</li> <li>→ Plus de 100 PME membres avec une croissance de revenus de plus de 50, 100, 250 et 500 M\$</li> </ul>
	<p><b>Programme de développement des talents</b></p> <ul style="list-style-type: none"> <li>→ Plus de 1 200 étudiants (B. Sc., M. Sc. et doctorat) formés en IA, en science des données et en chaîne d'approvisionnement intelligente</li> <li>→ Plus de 25 000 professionnels formés/en perfectionnement en IA et en chaîne d'approvisionnement intelligente</li> <li>→ Plus de 4 000 personnes venant de sous-catégories de groupes sous-représentés</li> </ul>
	<p><b>Promotion de la collaboration</b></p> <ul style="list-style-type: none"> <li>→ Plus de 50 projets réalisés/en cours</li> <li>→ Plus de 300 membres et partenaires de la supergrappe</li> <li>→ Plus de 10 événements de réseautage et de développement de projets</li> </ul>

# Conclusion

Supply chains are critical assets for the Canadian economy of both the present and future.

The Canadian supply chain currently provides more than 1 million jobs and makes up 10% of our annual GDP, allowing Canada to maintain its status as a strong export nation.

In the future, an improved supply chain will help support Canadian productivity growth efforts and improve Canadian presence on global markets, generating more than 16,000 jobs and contributing \$16.5 billion of GDP by 2028.

The introduction of AI technologies in supply chain operations represents a critical opportunity to establish Canada and Canadians as leaders in the perspective industries.

Leveraging our country's leading position in AI research, **Scale AI** will focus on helping Canadian companies, from SMEs to large corporations, leverage AI to improve their supply chain operations.

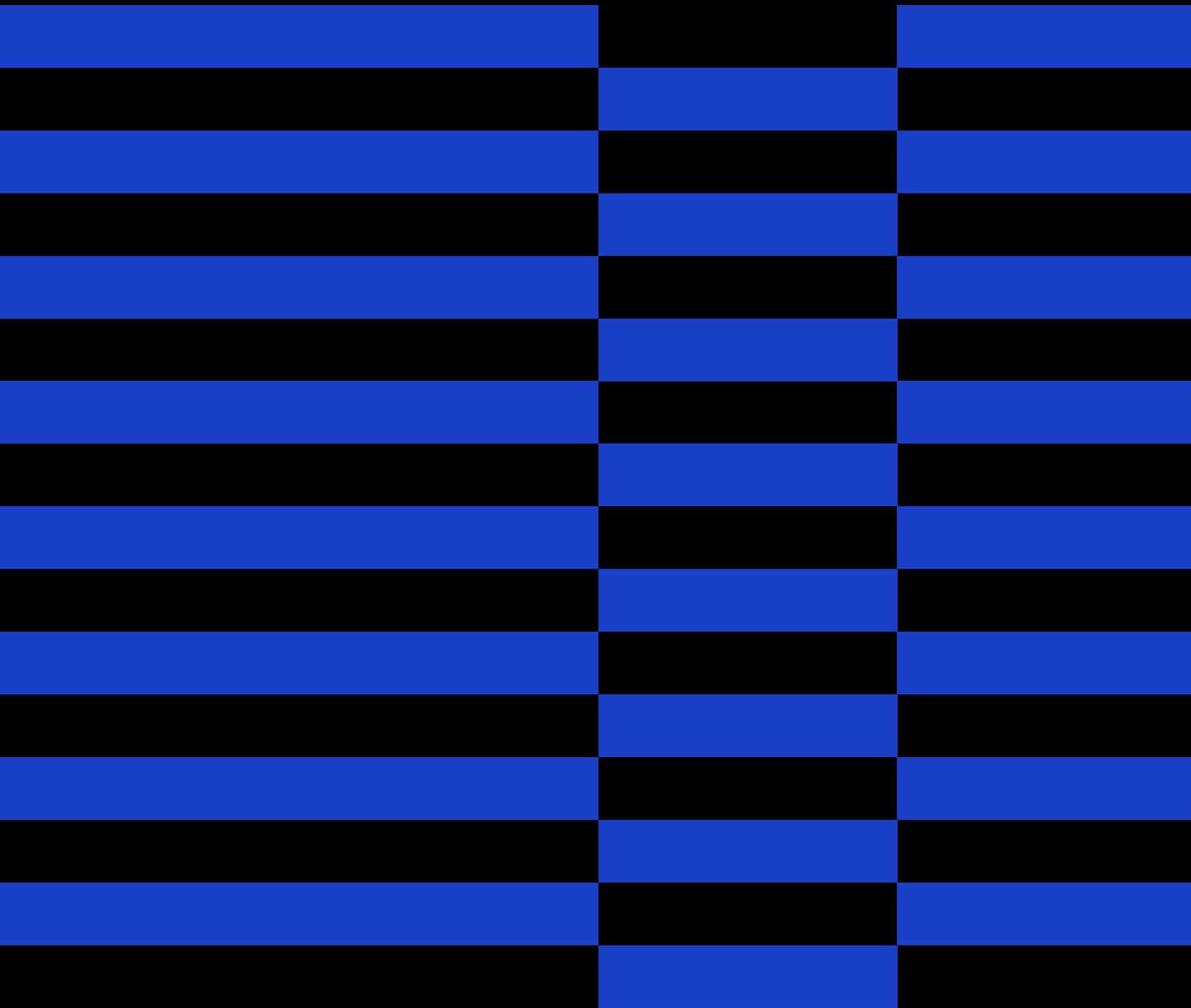
We will accomplish this by first creating an ecosystem that links universities, SMEs, AI product providers and corporations. Once established, the ecosystem will continue to grow and evolve, improving the talent pool available on the market, both in AI technologies and supply chain activities.

By concentrating our efforts on SMEs and startups, we will be able to accelerate their growth both within Canada and internationally. By helping companies create AI solutions for supply chain, we will enable development efforts that will allow them to productize their solutions to create profitable business opportunities.

Finally, by supporting industries such as retail, manufacturing, transport and logistics, and infrastructure and construction, to integrate AI in their supply chain operations, will allow for significant gains in productivity and efficiency.

Now is the time.

Canada, as a trading nation, must seize the opportunity of AI introduction in supply chain. As a business-led consortium, **Scale AI** is deeply committed to driving economic growth and contributing to the development of an innovative, competitive, diverse and inclusive Canadian economy.



**SCALE | AI**