



The Chamber of Commerce
of Metropolitan Montreal

Artificial intelligence

A CORNERSTONE OF MONTRÉAL'S ECONOMIC DEVELOPMENT



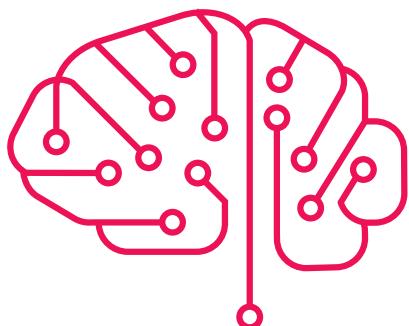
What is artificial intelligence and what are its applications?

Artificial intelligence (AI) is booming in Montréal. In fact, intelligent systems will transform our industries and lead us into the next industrial revolution.

What is AI?

There is no single definition, as AI is an evolving concept. In simple terms, AI systems are machines and software designed to reproduce and improve upon human capabilities. At the forefront of innovation, AI includes a number of emerging technologies, such as robotics and big data.

AI has 4 main areas of application



DESCRIPTIVE: What happened?

Application: image recognition

DIAGNOSTIC: Which part is working or malfunctioning?

Application: medical diagnostic tools

PREDICTIVE: What's going to happen?

Application: traffic planning

PRESCRIPTIVE: How do we prevent or reproduce an event?

Application: predictive maintenance

AI is already being used for many services and products



Health care:
diagnostic platform



Cybersecurity:
anomaly detection



Fintech:
robo-investment
advisors



Intelligent cars



Agri-food:
smart
farming



**Personalized
marketing:**
chatbots



Video games:
customized player
interaction



Virtual assistant

Become an AI pioneer in your sector

Montréal companies have everything to gain by positioning themselves as early adopters of AI, as these technologies will provide significant gains in productivity and revenue.

**AI can be used in every step
of the value chain**

1

PLAN

demand forecasting and planning + capacity
and resource utilization planning and more.

2

SOURCE

automated sourcing
and procurement.

3

MAKE

automated in-plant logistics and
warehousing.

4

DELIVER AND RETURN

inventory and factory/store
replenishment.

5

QUALITY ASSURANCE

scheduling and predictive disruption analysis + real-time data integration,
traceability and visibility.

6

TRAINING

How will AI transform our key industries?

AI is booming and will accelerate business growth in all sectors

TRANSPORTATION AND LOGISTICS

AI will lead to significant time gains in transportation and travel. Intelligent programming will also help us better control traffic and transform business models in transportation and logistics.

In the near future, AI will support the development of self-driving vehicles and sophisticated driving assistance systems.

3 high-potential applications

Autonomous trucking and deliveries

Traffic control and congestion reduction

Reinforced security



one million jobs

10% of our GDP

Creates value for:

Companies

Suppliers

Distributors

Customers

CANADIAN SUPPLY CHAIN

Digital technologies and AI are a game changer. The enormous volume of data generated by these advances can be used for demand planning, product customization, pricing, optimized production flows, automated operations, traceability, the circular economy, and more.

In the near future, AI tools such as automated algorithms will play a key role in human decision-making. Now is the time to act: Canada must take advantage of its position as a leader in technology and AI to strengthen our economy and translate our impressive scientific achievements in artificial intelligence into concrete benefits. To prepare for these major changes, Canada needs a state-of-the-art supply chain that is driven by AI.



RETAIL

Intelligent retail businesses will continue to develop personalized purchasing and innovate in marketing and loyalty strategies. For example, AI will allow companies to optimize the customer e-commerce experience.

In the near future, retailers can invest in AI capabilities to optimize inventory and order management and capitalize on augmented reality to create immersive purchasing experiences.



3 high-potential applications

Customized design and production

Inventory and delivery management

Forecasting of customer demand and orders

3 high-potential applications

Diagnostic imaging

Medical data analysis

Early disease detection

LIFE SCIENCES AND HEALTH TECHNOLOGIES (LSHT)

AI systems can analyze massive amounts of data to produce diagnoses and identify the best treatments.

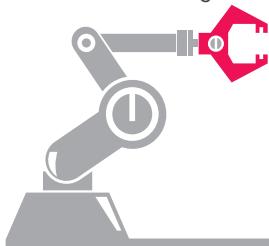
In the near future, AI combined with advances in genomics and big data will accelerate innovation in LSHT and will improve patient characterization and treatment thanks to the emergence of precision medicine.



MANUFACTURING

Here, advanced technologies meet Industry 4.0 to bring together artificial intelligence, the Internet of things, 3D printing, robotics and more. Companies can use AI to accelerate manufacturing innovation by automating processes to reduce their costs, shorten production times, and offer better-quality products with a high added value.

In the near future, AI will not only make human work more productive, but also significantly improve the performance of machines at the factory.



3 high-potential applications

Enhanced monitoring
and processes that self-correct

Supply chain optimization

On-demand production

3 high-potential applications

Personalized financial planning

Fraud detection

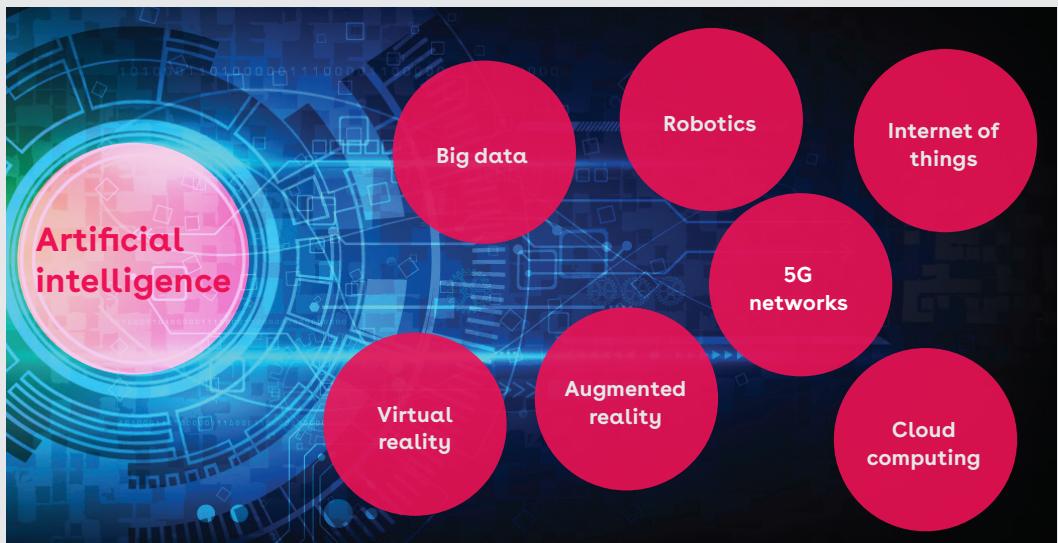
Process automation

FINANCIAL SERVICES

AI supports the deployment of financial technologies that can anticipate market risk and also help companies fine-tune their services. AI lets these businesses effectively assess the needs and profile of their clients to develop personalized investment strategies at a lower cost.



AI advances are supported by different types of technological innovation



AI methods

OPERATIONS RESEARCH

Operations research is a discipline related to optimization and decision support that uses mathematical methods to determine the fastest paths and optimal use of resources to reach a goal. This area of application aims to find solutions when other approaches are unworkable, for example, due to data complexity or volume.

Montréal is a world-class hub of expertise in this area thanks to the Canada Excellence Research Chair in Data Science for Real-Time Decision-Making held by Professor Andrea Lodi at Université de Montréal.

DEEP LEARNING

In the future, machines will hone these capabilities thanks to deep learning. This AI method is based on how the human brain functions and consists of processing information with several artificial "neuronal" layers.

Montréal has become the world's epicentre of deep learning thanks to Professor Yoshua Bengio and his team of international experts at the Montreal Institute for Learning Algorithms (MILA).

MACHINE LEARNING

With the development of technologies that support AI, computers can now learn by themselves. This is called machine learning in which computers identify patterns in raw data through algorithms that learn by example.

DATA MINING

Data exploration and extraction through data mining involves statistical and unsupervised methods of machine learning. Data mining is used to extract knowledge or information from large amounts of data to solve complex problems.

A major economic sector on the world stage

AI will drive world economic growth over the next decade. This value will be created through innovations that increase productivity, lead to more effective and personalized products, and create new business models.

Prediction of IA impacts by 2030



14%

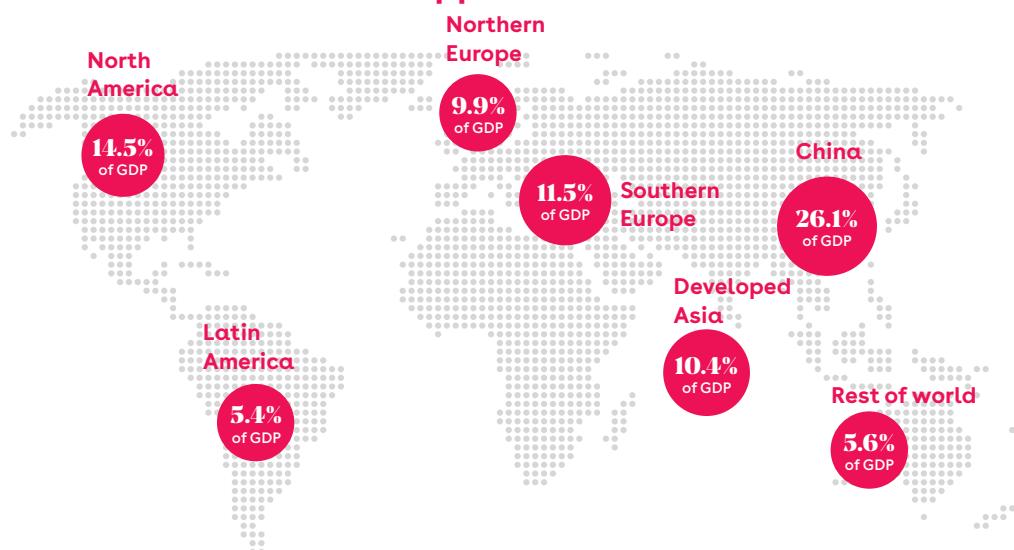
increase in world GDP

For a total of **\$15.7 trillion*** in wealth creation, including a:

\$9.1 trillion*
gain from increased demand

\$6.6 trillion*
gain from increased productivity

AI will drive economic growth and international business opportunities



* USD

Source: PwC, 2017.



Montréal: a global AI hub

Why is AI expanding so quickly in Montréal?

Our unique strengths have created a first-rate AI ecosystem

Montréal is where technology meets creativity

Critical mass of technical companies and talent:

91,000 people work in ICT
at 5,000 organizations

Hotbed of creative industries:

One of the world's top 5 cities
for video game development

Montréal is where academics drive innovation

11 universities and a world-class research ecosystem:

Very high concentration
of AI scientists
in the world

Top Canadian city
for university
R&D

9,000 students
in AI and
big data

Montréal has a world-class reputation

Record wave of investment in AI and big data:

19% foreign investment
in 2016

Arrival of world leaders
in the industry



Main partner for the initiative

*This document was developed
in partnership with PwC*



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