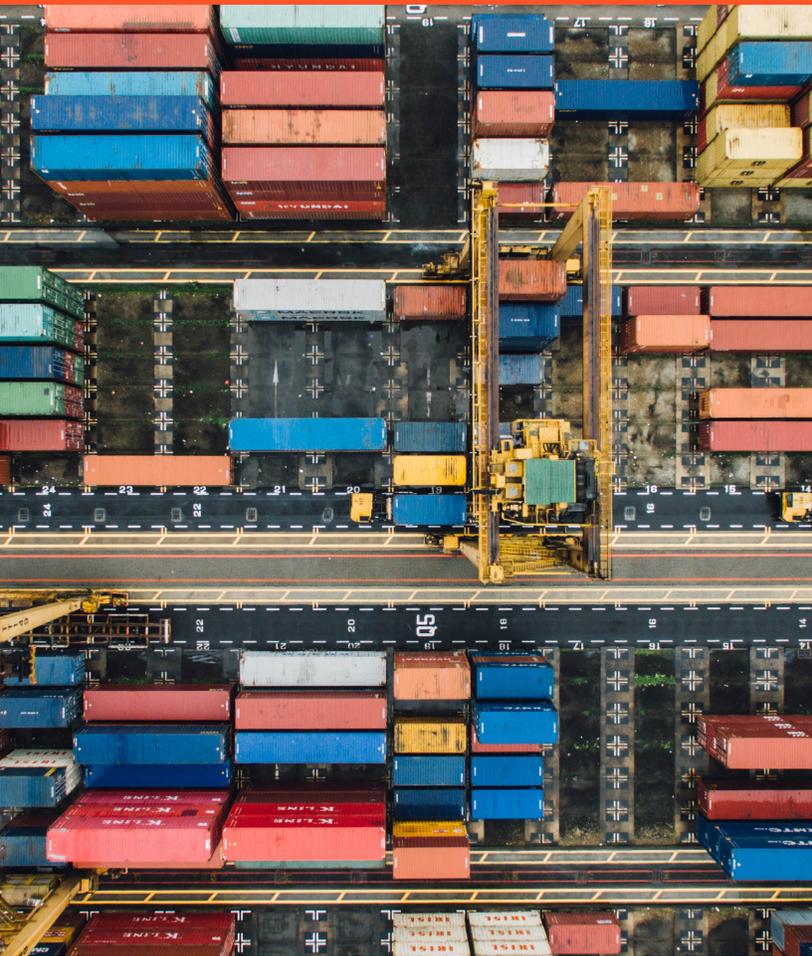


# AI in the Real World

Port of Montreal | Transportation & Logistics



**SCALE|AI**

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Written in collaboration with tech and business journalist Vawn Himmelsbach.

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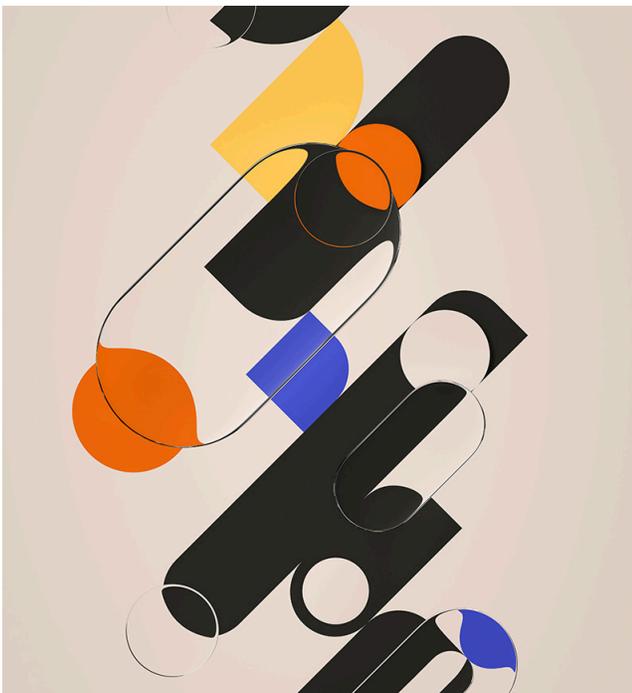
Jump ahead of the competition by making the most out of artificial intelligence now.

# The Competition Is One Step Ahead of You

This is something no CEO wants to hear.

Efficiency has always been a priority in the transportation and logistics sector, but since the start of the pandemic that need has increased tenfold. With supply chain disruptions, container shortages and inventory challenges, the industry has been plagued with challenges. Efficiency is now about resiliency.

That's where artificial intelligence has a key role to play. AI isn't just about self-driving cars and intelligent drones; it's about optimizing routes and managing assets to make companies faster, more efficient and, of course, more resilient. It can also help to drive cost savings in the near- and long-term. Rather than buying more trucks or ships, or expanding ports of call, AI gives transportation and logistics companies the ability to do more with what they already have.



Route optimization is already in use by most transportation and logistics companies, but current software is typically based on operational research (designing and optimizing routes based on schedules and other factors) rather than machine learning, where machines 'learn' from data and even provide predictive capabilities. Incorporating AI can help to optimize fleets by eliminating bottlenecks, reducing empty runs and improving asset utilization, while resulting in a more fluid, more predictable supply chain that's easier to track. But to maximize these benefits, any AI solution should provide visibility for all stakeholders.

Whether you're a CEO or an IT manager, maintaining the status quo is no longer an option. If you're not already making the leap to AI, then you're already falling behind. That's because AI models are trained on new data and, over time, become more and more accurate. Those who choose not to invest now will be much less competitive than transportation and logistics companies that leverage their data and digital tools now.

But AI isn't just a technology strategy; it's a business strategy. And to be successful, the two must work in tandem. That's why leadership plays an essential role in driving AI strategy throughout the organization and IT leaders should have a seat at the table. If done correctly, transportation and logistics companies can reduce risk and costs, while gaining new flexibility to optimize routes and manage assets—setting them up to be more competitive and resilient in a challenging environment.

A handwritten signature in black ink, appearing to read 'Julien Billot', with a stylized, overlapping structure.

Julien Billot, CEO at Scale AI

# 5 Ways That AI Creates Business Value in Transportation & Logistics

## 01

→ Expand route optimization and asset management across networks, for all stakeholders

## 02

→ Optimize fleets to eliminate bottlenecks, reduce empty runs and improve asset utilization

## 03

→ Reduce cargo delays and overall dwell time while maximizing output to the port's logistics hub

## 04

→ Respond more quickly and accurately to fluctuating supply and demand

## 05

→ Create a more fluid, predictable supply chain that's easier to track

# AI Success Story

## An In-depth Look at the Port of Montreal

The Port of Montreal is the second largest port in Canada and the fifth largest container port on the Eastern Seaboard of North America, serving the Quebec, Ontario and U.S. markets. Overseen by the Montreal Port Authority (MPA), the Port of Montreal is a diversified trans-shipment centre that handles all types of goods: containerized and non-containerized cargo, liquid bulk and dry bulk. It's also an intermodal hub, featuring its own rail network directly dockside connected to Canada's two national rail networks, CP and CN. The MPA also operates a cruise terminal and port centre.

The Port of Montreal has been working with Scale AI, Canada's AI innovation supercluster, to build a 'smart' port that will navigate the movement of containers through a network driven by a complex web of information exchanges between numerous stakeholders.

By using AI and predictive analytical tools, they will be able to better synchronize all elements of the rail and marine supply chain and improve upstream visibility. But at the start of the pandemic, they shifted focus to deal with the immediate humanitarian needs of the time. Based on an algorithm that quickly identifies targeted cargo as soon as it leaves its port of origin, they came up with a logistics tool to help supply chain partners prioritize personal protective equipment (PPE) and medical supplies to fight COVID-19.

### THE CHALLENGE

"The challenge was simple: save lives," says Daniel Olivier, director of business intelligence and innovation with the MPA. "How can we save lives by accelerating critical cargo containers out to market and making



sure that frontline workers get access to PPE and medical supplies as soon as possible?"

At the start of the pandemic, every country in the world was suffering a deficit of PPE, such as disinfectant, masks, gowns and ventilators. Scale AI came out with a request for proposals on how AI could help with the COVID-19 crisis. The Port of Montreal was about to launch its rail optimization project when the RFP came out, and had already done an audit of its data to assess and evaluate its digital maturity to launch a large-scale AI project.

"So in a nutshell we were ready to go when the COVID crisis hit," says Olivier. "We dropped everything and decided to focus on the pandemic to help solve these issues. The Port of Montreal felt morally compelled to actually do something about the crisis."

The result is CargO2ai, a humanitarian logistics tool developed in the spring of 2020 through a partnership between the Port of Montreal, CargoM, Termont, MGTP, Scale AI and Ivado Labs to help supply chain partners prioritize PPE, medications and medical equipment, and to expedite their processing and delivery. CargO2ai uses AI to quickly identify and prioritize the critical cargo that Canadians need to avoid supply delays and stock shortages during precarious economic and public health situations.

The MPA acts like a landlord and a rail coordinator, while the two terminal operators—which operate four international terminals—are its partners on the ground, handling cargo, supported by two railways and the trucking community. Another critical partner is CargoM, a logistics cluster that rallies the major stakeholders in Montreal’s logistics industry.

“We had to work as an ecosystem to make sure that all partners understand the solution and play their part in fast-tracking those containers,” says Olivier. “There’s no point in us fast-tracking a rail container if it’s going to leave Montreal, end up in Toronto and then sit in Toronto for days and days before it actually moves onwards to Edmonton or Calgary or Vancouver, so all the players have to play their part.”



### Phase 01 → Using AI to Identify Critical Cargo

The first phase of CargO2ai involved using AI to identify critical cargo containers on vessels that call at the Port of Montreal. Prior to arrival, each vessel will send a cargo manifest, which includes millions of lines of data, from transport document numbers and consignors/consignees to marks, numbers, descriptions and quantities.

At the start of the pandemic, the Canada Border Services Agency published a list of critical cargo and their harmonized system (HS) codes — a numerical code and text description of each item.

**But with millions of lines of data in each cargo manifest, it’s impossible for a human to go through each line to find specific items; it’s like finding a needle in a haystack.**

“That’s where the magic of AI comes in,” says Olivier. The CargO2ai algorithm was built around the HS codes provided by the Canada Border Services Agency. “Our algorithm uses Natural Language Processing to recognize text and look for keywords and numerical codes in the cargo manifest. And we came up with a very, very aggressive timeline to implement this algorithm.”

After submitting a project proposal to Scale AI and successfully obtaining funds, CargO2ai was up and running within 10 weeks and fully functional by July 2020. This allows the Port of Montreal to identify critical cargo before any vessel arrives at the port. “The project was record-breaking fast,” says Olivier. “It was so fast that we decided to develop a second phase to the project.”

## Phase 02 → Using AI for Track-and-Trace

The second phase of the project was rolled out between July 2020 and May 2021, which involved developing a track-and-trace dashboard that follows a container from the time it's offloaded from a vessel to the time it's loaded onto a railcar or truck. This dashboard allows the Port of Montreal to measure container dwell time — a critical metric for measuring performance. While Phase 1 focused on PPE, Phase 2 was expanded to include COVID-19 medication and medical supplies.

“The objective was to reduce container dwell times for critical cargo by 50 per cent — and we've achieved that,” says Olivier. Once containers are offloaded from a vessel, the port's rail management software flags any containers with critical supplies, so they're loaded onto the next available train. If they're heading out by truck, terminal operators send out a notification to truck drivers that they need to deliver a high priority container.

But the technology doesn't eliminate the need for people.

**Human validation is required to ensure they're not moving, for example, Darth Vader masks instead of KN95 masks.**

This allows the algorithm to 'learn' and continuously improve.

The algorithm is flexible so they're able to add more keywords and cargo codes as needed. “Today it's the COVID-19 crisis; tomorrow it could be flour or toilet paper. So if that's the case, we can fast-track flour or toilet paper,” says Olivier.

“The solution was built to be modular and scalable so we can basically apply the algorithm to other types of cargo. The next natural next step would be hazardous materials.”

## THE RESULTS

CargO2ai is a logistics tool with a humanitarian calling, which has contributed to the collective effort to fight the pandemic. “There are no fees involved so nobody is making money from fast-tracking these containers — it's strictly done on a humanitarian level,” says Olivier.

So far, the Port of Montreal and its partners have processed 5,800 critical-cargo containers — and counting — for humanitarian purposes. And they've been recognized for their efforts, winning The Lighthouse Award in Information Technology for CargO2ai at the 2021 American Association of Port Authorities (AAPA) Annual Awards.

There's no going back to the status quo; the project has improved communications between all stakeholders, which will have positive impacts going forward. “I used to receive the cargo manifest 24 or 48 hours out. Now I get it up to 10 days out — in some cases as early as the vessel leaving Europe,” says Olivier.

“We've been able to significantly improve the timeliness of the reception of the data,” he says. “And the more upstream the data, the better for us from a planning perspective to make sure our railcars are ready, the trucks are ready, the labour is available. Understanding your data and having a better data pipeline are all benefits going forward.”

For the C-suite, the project has demonstrated corporate responsibility while improving supply chain velocity. Managers were able to increase the discipline of their data exchange. Ultimately, this will help all stakeholders reduce cargo delays and overall dwell time while maximizing output to the port's logistics hub.

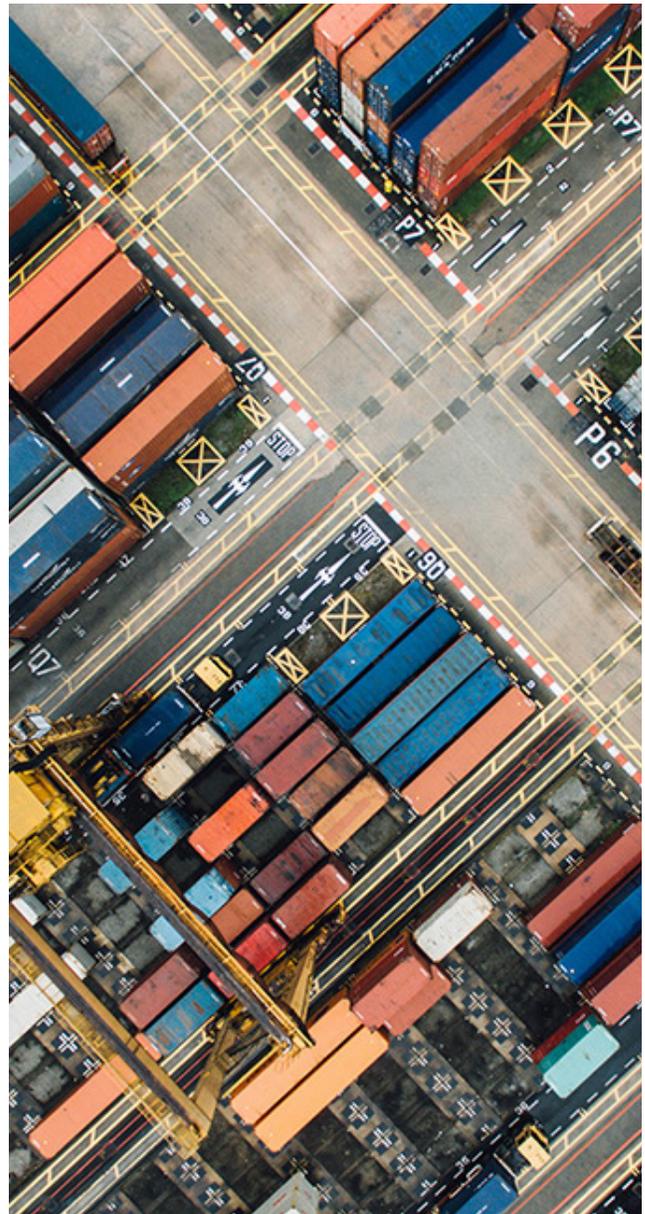
## WHAT'S NEXT

“Everything we’re applying here has future commercial potential, so we were willing to invest in a solution that would increase fluidity of the supply chain — because fluidity is the name of the game in terms of port competitiveness,” says Olivier.

**“Ports compete on fluidity, on how long your container stays on the dock. It’s as simple as that. Ports with lower dwell times are most competitive, especially for imports.”**

While this project was developed for the Port of Montreal, it’s exportable under the funding principles of Scale AI, which provides for the sharing of algorithms based on Natural Language Processing and open source technology. Trucking companies, freight forwarders, shipping lines, charterers and operators are invited to use the system to its full potential.

“All stakeholders and the C-suite take pride in saying that they’re able to contribute to this humanitarian effort,” says Olivier. “I’ve never said this very often in my career, but this is a project that isn’t financially driven. It’s morally driven. That being said, our partners also see the potential commercially, so they can see beyond the immediate COVID need.”



# AI Success Story In Numbers

2nd → Largest port in Canada

5th → Largest container port on the Eastern Seaboard of North America

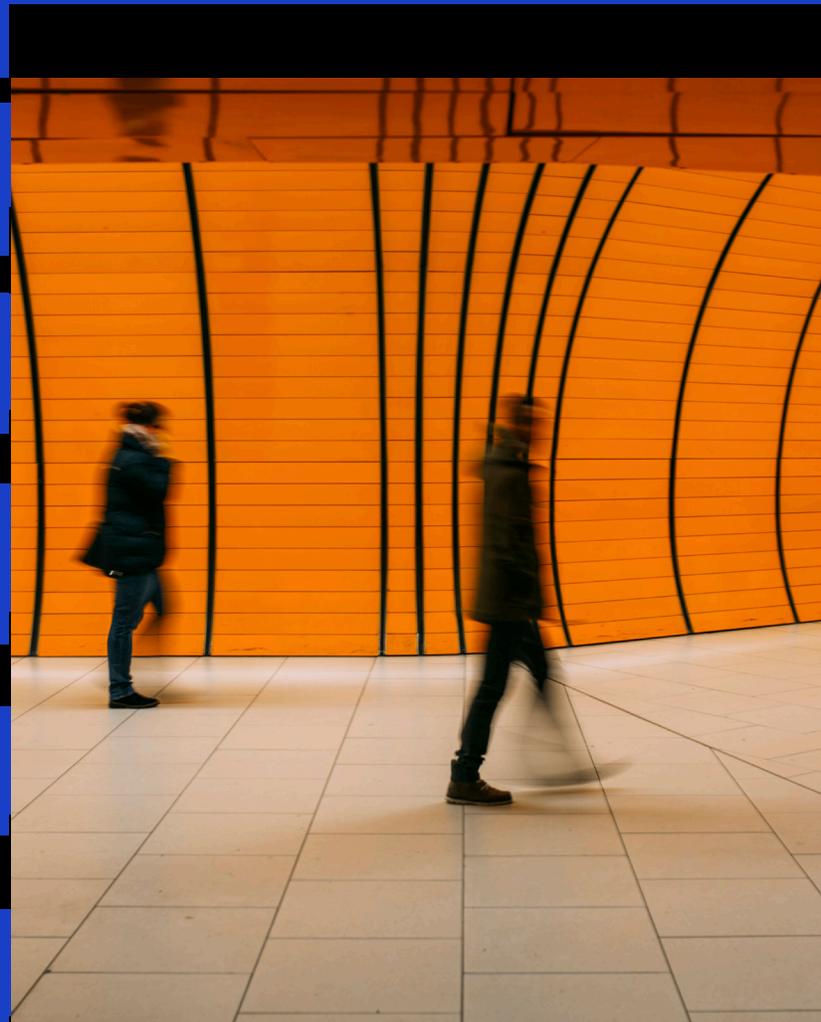
10 → Number of weeks it took to get CargO2ai up and running

50% → Achieved goal to reduce container dwell time by this much

5,200 → Number of critical-cargo containers processed for humanitarian purposes so far

# Introducing Canadian Supercluster Scale AI

Scale AI is one of Canada's five innovation superclusters, created to advance the Canadian AI innovation ecosystem. Scale AI offers funding, expert guidance and a community of like-minded peers, and invests in companies across a range of industries that are deploying AI to enhance their supply chain—with \$200 million of collective investment, and counting.



Scale AI has made a significant investment in the Port of Montreal, which serves as an example of how an increasing number of Canadian companies are using the power of AI to boost productivity, strengthen competitiveness and secure long-term growth. With CargO2ai, Scale AI funded 100 per cent of Phase 1 and 50 per cent of Phase 2 — funds which contributed to the development of the algorithm.

**“It shows that AI is relevant to fundamental issues including humanitarian efforts,”**

says Olivier. “We have a very strong ecosystem of AI in Montreal. We have strong institutions. We have talent. And now we have dedicated funding, and that’s really a game changer. We certainly couldn’t have done this kind of project without Scale AI.”



**“Surrounding yourself with the right people is more than a strategy, it’s the key to success for companies looking to integrate AI into their business.”**

→ Isabelle Turcotte, CMO at Scale AI

### Scale AI’s funding



Depending on membership type, Scale AI connects its members with financial, technical and educational resources, as well as peer support, focused on artificial intelligence and intellectual property expertise, all engineered to help them scale their organization, their partnerships and their potential.



“You can’t speed up the training of your algorithm. So it’s important to start as soon as you can because every day that you lose, you’re losing ground.”

→ Clement Bourgogne, VP Strategic Programs at Scale AI

Since its inception



More than

**303**<sup>M\$</sup>

in investments

More than

**300**

projects across Canada



# Get Started With Your AI Project



# Timeline



## YOU ARE HERE

First, you must gather information on the project submission process. In order to do so, you can:

- Sign up for a Scale AI membership
- Register to one of our weekly webinars hosted by a Scale AI investment director
- Join networking events to find potential partners
- Download our submission guide



## PROJECT SUBMISSION FORM

Then, fill out the project submission form on our website. You can contact us at any time if you need help at this stage.



## DETAILED PROJECT PROPOSAL

After you have received the initial eligibility confirmation from Scale AI, you can start working on your detailed project proposal submission.



## PROJECT AGREEMENT

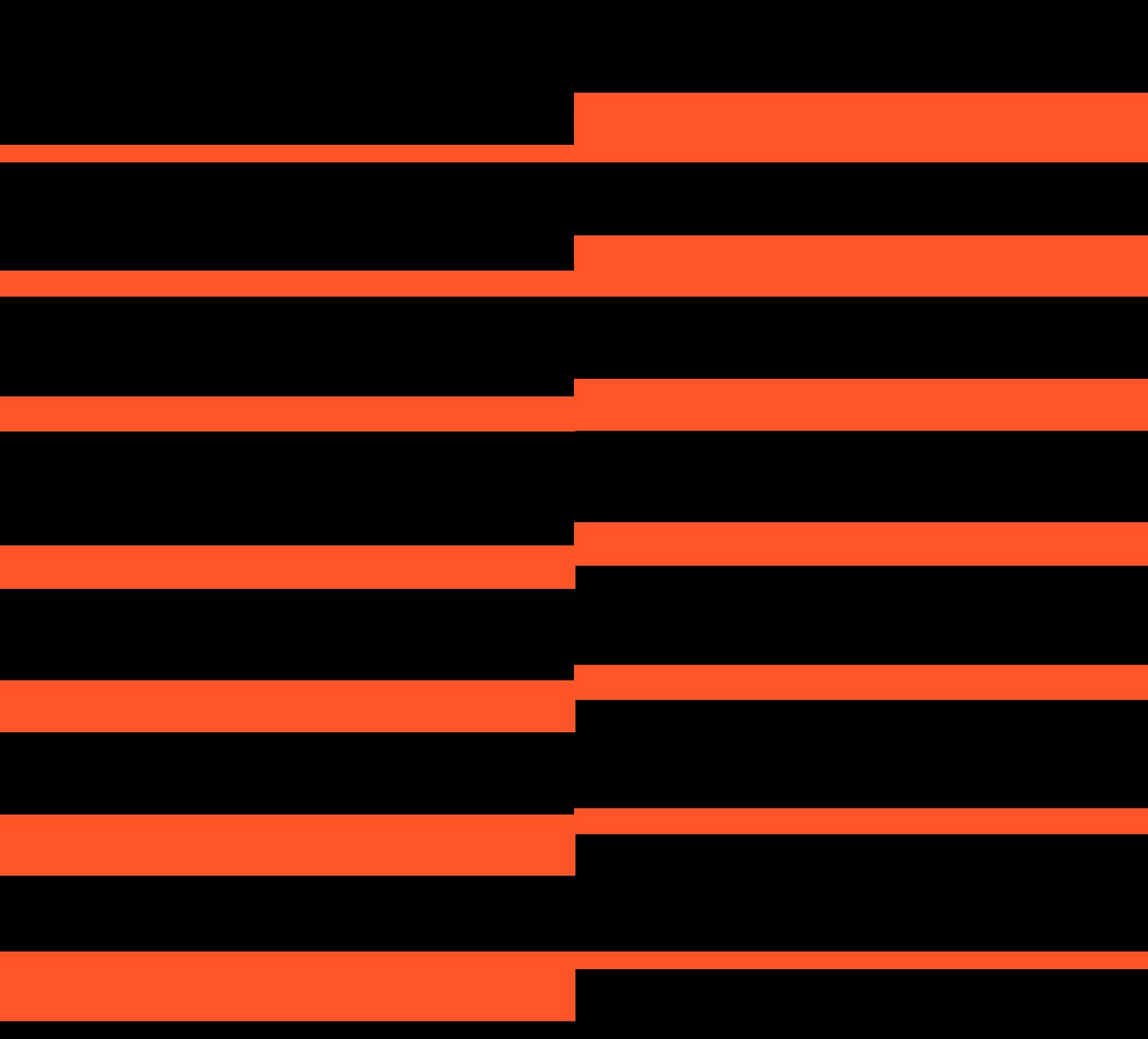
Once the Scale AI Board ratifies your project, you can gather resources and collaborate to gear up for the launch.



## LAUNCH

Your AI project is well implemented in your day-to-day operations and you can reveal the latest news to your peers.





## Reach Out ↓

For any question regarding project submissions: [question@scaleai.ca](mailto:question@scaleai.ca)