

Seeing through the DATA



Contrary to what many believe, artificial intelligence won't automate supply chains anytime soon. It does make possible planning decisions that are far better informed than previously possible.

Although the inner workings of artificial intelligence (AI) are horrendously complex, the technology can be described from a business perspective as a utility for making low-cost predictions. This argument forms the central thesis of *Prediction Machines*, the influential 2018 book by Canadian entrepreneurs and business professors Ajay Agrawal, Joshua Gans, and Avi Goldfarb.

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“When we're talking about AI, it's the scope and speed of prediction that's unique here,” says Sheldon Fernandez, CEO of Waterloo, Ontario-based AI

startup DarwinAI. “It can look at a lot of data and make predictions that we never would come up with on our own, and it can do them very, very quickly. So that's the benefit in a nutshell.”

Predictions, of course, vary widely depending on context. The AI “brain” in an autonomous vehicle might predict that a shape spotted by a camera represents a safety hazard. A medical app might identify a dark spot on an MRI image as a health threat for a patient. A supply chain AI can single out a numerical trend pointing to an impending parts shortage.

“At its heart, we have to think of AI as

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just a new set of statistical models,” says Clement Bourgogne, COO and vice-president of strategic programs at Scale AI, a government-sponsored supercluster supporting the integration of AI in Canadian supply chains. “What AI does is help make predictions in a more detailed and accurate way than our current or previous statistical models.”

In supply chain applications, these models learn to discern patterns in massive amounts of unstructured data – text, numerical, graphic, video, audio – from sources such as government websites, corporate information services, media publications, and social media platforms. This provides a far greater scope than was previously possible.

“With demand planning, business optimization, and supply chain decisions, there are still a lot of people pulling data manually and plugging it into apps to build their decisions,” says Warren Shiau, research vice-president at IDC Canada. “So they decide what their reliable sources are, and stick with them – that’s human nature and it can de-optimize decisions in times of uncertainty. AI can change that by looking for and pulling data from anywhere and any new source that’s relevant to the decisions being made, and constantly running new analysis searching for best outcomes.”

“A lot of people usually just think from an internal data perspective,” says Dr. Alexander Wong, University of Waterloo engineering professor, Canada Research Chair in the area of artificial intelligence, and a founding member of the Waterloo Artificial Intelligence Institute. “But a lot of times when you build models just on your local perspective, if there’s any kind of large fluctuations due to external factors, you really can’t take care of them properly.”

A world upended

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“Basing our 2020 plans on 2019 did not serve us well,” says Shari Diaz, innovation, strategy, and operations director, IBM Sterling, based in Columbus, Ohio, “and

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we’re in big trouble if we plan 2021 based on 2020. We need to be able to take stock of what’s happening right now in the world.”

“Most companies rely on historical sales,” says Bourgogne. “But those predictions don’t account for special events, weather factors, or major global events that could influence demand. AI is able to capture this information from other sources and integrate it using very strong statistical models that are not based on gut feeling or what ‘makes sense’ to somebody. It’s based purely on statistical analysis, which is what makes it so powerful.”

Seeing an accurate picture

Not all AI predictions rely on external information – vision systems and AI are becoming a powerful combination for understanding the status of physical goods within a facility.

“We’re seeing huge interest in computer vision AI for a wide variety of tasks,”

says Wong. “One for which there is huge interest is inventory management. We’re finding that in many situations there’s a big discrepancy between what people have and what’s on their spreadsheets. So we might get a red flag at some point that we’re running out of a part.”

Another area is inbound quality inspection of parts, which leverages AI’s unique ability to spot anomalies that signify a significant variation from the norm. “If a particular component is faulty, then whatever you assemble will have an inherent flaw,” says Wong. “So having automated systems that will inspect your incoming components becomes a very great time and money saver.”

Canada is an AI powerhouse

Canada is now recognized as a global leader in advanced AI. DarwinAI, for example, is providing complex supply chain solutions for Lockheed Martin, Honeywell Aerospace, and other large corporations. Missing from its customer list, for a large part, are Canadian manufacturers.

Scale AI is working to change attitudes, and is sponsoring a variety of projects in areas such as demand forecasting for aircraft parts, supply chain forecasting for drug distribution, and fleet management.

“We have identified, just in the first year, more than 100 startups applying AI for supply chain,” says Bourgogne. “What’s missing is the market to adopt these technologies. So there needs to be a shift in mindset where you’re willing to partner with less established players. If you do that the payoff can be tremendous.”

A common misconception is that artificial intelligence is an all-or-nothing proposition that takes an enormous investment. “You’ve got to start small,” says Diaz. “You’ve got to scope these projects very distinctly, do a business value assessment, and everybody’s got to know going in what you expect to get out of it.”

Another myth is that the bar of entry for AI is too high for all but the largest companies. “Smaller companies can move quicker on this than very large manufacturers,” says Fernandez, “so that could very quickly turn into a competitive advantage for them.” ■