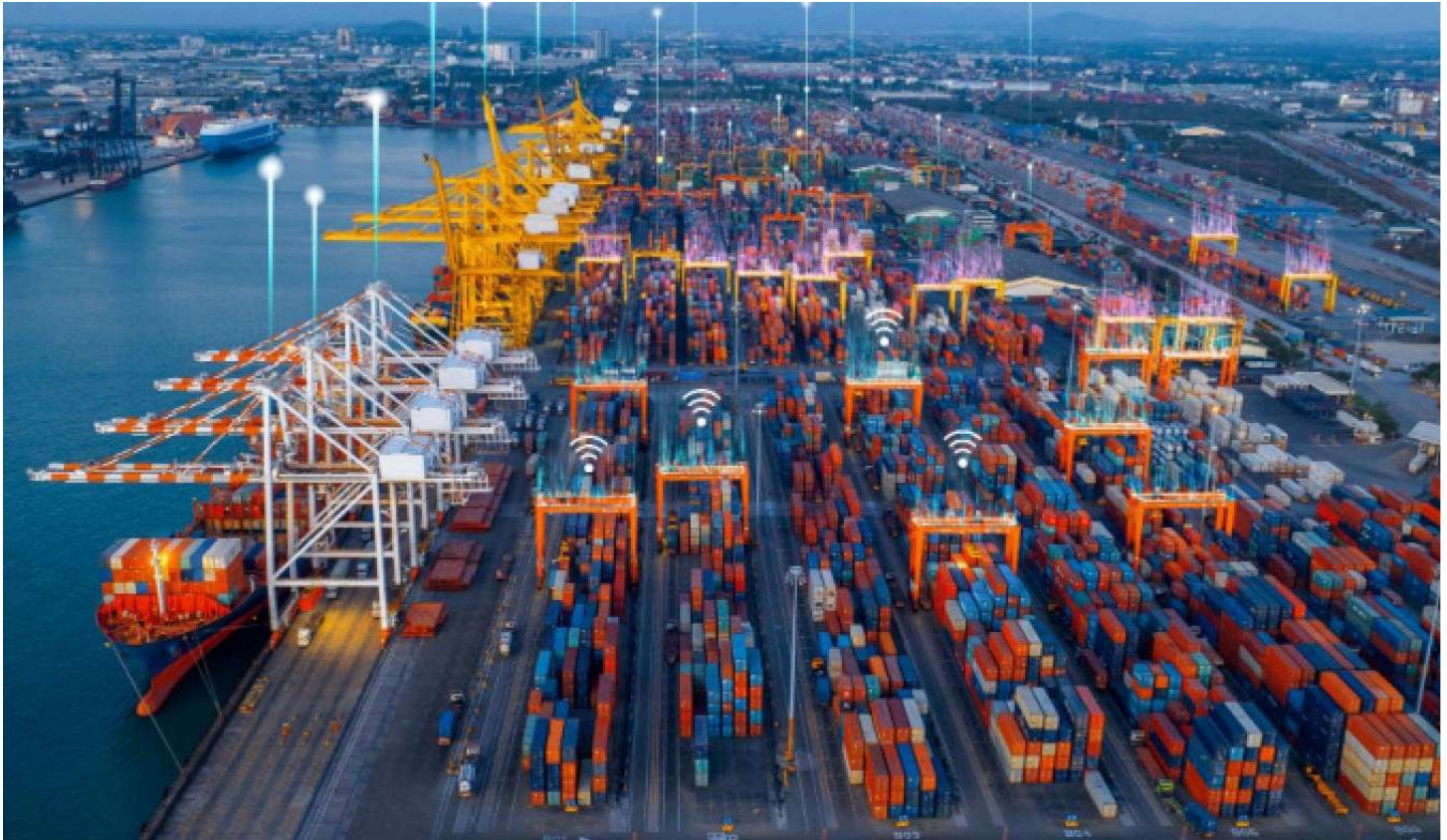


# Logistics' complicated structure requires equally complex approach to AI usage



*Global supply chains are managed through a mix of processes, a collection that doesn't fit neatly into any specific AI bucket. Photo credit: GreenOak / Shutterstock.com.*

**Eric Johnson, Senior Technology Editor | Feb 14, 2024, 7:58 AM EST**

The proliferation of artificial intelligence (AI) in logistics over the past year, predominantly around so-called generative AI, has led to a misunderstanding about the breadth of AI fields and whether generative AI is even applicable to many longstanding logistics challenges.

AI is so much more than generative AI, which is based on something known as large language models (LLMs), incorporating concepts such computer vision, machine learning, robotics, natural language processing and deep learning.

Global supply chains are managed through a mix of processes, a collection that doesn't fit neatly into any one of those AI buckets. Rather, organizations need to think

of the application of AI as they would any other complex management problem: requiring the use of multiple types of tools.

“We’ll look back and say ChatGPT kicked off a lot of conversations from within its own sub-domain,” said Alan Holland, CEO of Keelvar, which uses AI to develop freight sourcing bots for enterprise shippers. “But many companies are trying to apply [generative AI] extremely widely, in areas where it may not make sense. But they’re learning, and they’ll pull back and find areas where it does make sense.”

That experimentation will ultimately lead to companies realizing that other forms of AI need to be assembled like a puzzle.

“What we have today are rapidly developing subfields of AI that are appropriate for the tasks you are doing,” Holland said. “In sourcing, it’s about, who do we want to invite and what are we going to buy? What big mechanism are we going to use? What feedback are we going to include? And it involves different subfields in the big diagram of AI that you need to piece together to build an intelligent system.”

## A sequencing challenge

Holland’s contention is that most challenges faced by white collar workers are essentially workflow problems involving the sequencing of multiple tasks.

“You’re completing one task, and the output is the input to the next task,” he said. “And depending on what they’re seeing along the way, the human worker is diverting that workflow.”

Generative AI might work well in specific processes but may fall down when aimed at “solving a more quantitative problem, or one involving planning or reasoning, where you might need to look at another field within AI,” said Holland.

“Planning out your day is a different intelligence problem than working out a path from A to B, so all the subfields of artificial intelligence tend to break down a problem in different ways,” he said. “The part of your brain that processes language isn’t used to reason about how you should plan, so it’s not appropriate to use generative AI to generate business plans because it doesn’t have the logic or reasoning of that world.”

Gaurav Bajaj, CEO of Solvo.ai, which provides pricing optimization software for forwarders, said many problems in logistics need contextual AI models that are reliant on deeper industry-specific datasets than LLMs have access to.

“When you move into operations, that’s where you need to move away from LLMs and look at contextual models specific to those use cases, which are trained on the data,”

he said.

## Context needed

A contextual model refers to the data that describes “how you mathematically define a problem,” Bajaj said. So if a forwarder wants to improve its pricing efficacy, the mathematical definition is tied to what problem it is trying to solve, whether that’s widening its profit margin or increasing the number of rate requests it receives. The problem with LLMs, in that context, is that the data is usually too sparse to inform the model for that business problem, Bajaj said.

“People want context for a decision they see an AI model making,” he said. “Hopefully, over time, as people get more comfortable with AI, they won’t need to see the reasoning under the hood, but until then, it’s important to enable human-machine interaction where the contextualization is quite key.”

The desire to understand how AI works, not just if it works, belies most people’s rudimentary understanding of AI as a monolithic tool when there are more, and less, sophisticated versions of it underpinning even commonly used tools.

“[Estimated time of arrival] forecasting is a good example,” said John Motley, CEO of logistics software provider LOG-NET. “You can have ETA forecasting based on second grade math using a simple average. Or you might use linear regressions [where a data point is estimated based on its relationship to a set of variables], which is at a sort of high school level. And then you get into exponential smoothing,” where each data point in a time series is not weighted evenly but rather is given exponentially decreasing weight over time.

“That’s a non-linear approach and a really sophisticated way to calculate ETAs,” Motley said.

LOG-NET's product allows shipper and logistics companies to manage a wide range of connected processes, from generation of the purchase order to managing production in the factory to translating a fulfilled order into a logistics booking with an air or ocean carrier. That relies on a “quilt” of AI applications.

“For the vendor [container] booking process, you need to forecast when they will release the goods, and are they normally on time,” Motley said. “I need to make a carrier booking, so I need to ingest that data about the order being on time and in full. I need to pass that information to my warehouse that’s doing consolidation, or to my carrier to make sure there’s space. All of those things require discreet forms of AI.”

## Pricing nuance

For Solvo, the ambition is narrower, but still requires the use of multiple forms of AI.

“Setting the right price has been a challenge for forwarders,” Bajaj said. “Everyone understands the cost-plus model where we calculate the cost and put in a 10% margin and offer that price to the customer.”

The actual margins a forwarder retains may be closer to 3% to 4% when “gross margin is converted into EBITDA [earnings before interest, taxes, depreciation and amortization],” he said, “and that creates an existential crisis” when the market rates are as low as they’ve been the past year.

Solvo has focused on helping its forwarder clients understand its customers’ “propensity to pay” and combining that with the direction the market is going. Ultimately, the goal is to thread the needle between protecting margins while retaining customers.

Holland said that type of intelligent system approach will only grow as AI-enabled software matures and people become more comfortable using it.

“The difference between intelligent systems and ordinary systems is [that] the software is changing as it learns more,” Holland said. “We’re rapidly moving to an environment where old static software systems that are installed and used in a routine fashion are disappearing, to be replaced by intelligent systems, where you come into work and it’s better each day.”

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