INSIGHT PAPER:

# Toppling 2 Major Misconceptions in Predictive Logistics

Growing Challenges

Shippers, carriers, terminal operators, freight forwarders and 3PLs spend millions of dollars and resources each year guessing important operational metrics such as booking allocations or container ETAs. But forecasting capabilities remain archaic and projections are inaccurate. Look no further than the costs associated with repositioning empty containers. The total cost to the shipping industry? $15-$20 billion annually, according to Boston Consulting Group (BCG).

The fundamental challenge is the complexity of global trade, which relies on a chain of interdependencies with anywhere from 5 to 25 parties playing a role across 20+ milestones in the supply chain. Each handoff and decision is based on a prediction of outcomes and every event has an effect on every other. Orchestration requires better predictions. Accurate predictions require greater intelligence. Yet despite mountains of data available in today's global supply chain, the ability to harness this data and efficiently execute global logistics remains challenging.

USABLE DATA & PREDICTIONS AVAILABLE via API

PREDICTION & SIMULATION

CLEAN STRUCTURE

SUPPLY CHAIN DATA
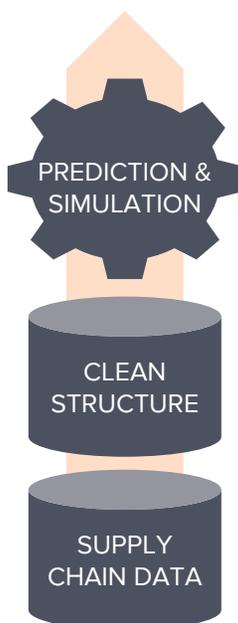
Can artificial intelligence be the answer? Can machine learning really help predict the future?

The good news for carriers, forwarders, shippers and terminals is that the short answer is, "*Yes, there is a clear path.*" But the road there requires a shift in mindset.

By utilizing the already-captured data from all touchpoints in and around the supply chain, running simulations and applying industry-tailored machine learning, enterprises can finally make use of their own data and generate intelligence to help drive true profitability. For example, **predictions such as *final inland destination container arrival* can be ~50% more accurate than traditional methods. Booking cancellation predictions can be over 90% accurate.**

3 Barriers to Predictive Logistics

Today, three barriers remain in global supply chain analytics:

1. Ultra-complexity: Global trade is overwhelmingly complex, with an interdependent end-to-end supply chain -- from purchase order through final delivery, and from raw materials to retail store. A typical shipment can involve anywhere from 5-25 different parties and handoffs. And managing this all efficiently depends on how accurately you can predict and plan. But because of the complexity and interdependency, orchestrating the movement of goods, containers and equipment - and the decisions that surround them - remains challenging. The number of moving parts in today's supply chain is unmanageable and predicting how parties will behave or shipments will move is simply too complex for the human brain.

2. Innovation barriers: There has been technology innovation in areas such as cloud, analytics and big data. Yet until today, true predictive logistics has remained elusive. Data is dirty, inaccessible, and siloed away in antiquated systems. Further, existing tools and technologies are inadequate at organizing disparate data, making intelligent sense of it, and allowing this valuable data to be adequately analyzed and made actionable.

3. An analog approach in a digital world: While the shipping industry has historically driven profitability by adding scale -- think mega-ships, mergers, alliances, and padding with buffer -- the day has finally come where throwing more resources at the problem is no longer sufficient. It can even have a negative impact (think: over-capacity). And it's the same in logistics planning: more analysts spending more of their days manually forecasting doesn't increase the predictive accuracy or intelligence needed in today's global trade environment. Manual forecasting is a job left over from an analog world, before digital transformation allowed data to be unlocked and harnessed by industry-tailored machine learning and AI.

Toppling Misconception #1:
The Data Problem isn't What You Think

For a community and ecosystem that has been slow to adopt innovative technologies for the last three decades, there is now a surprising attraction to data-centric strategies. We hear phrases like *data is the new oil* as companies seek to capture more data and put it to use. This is sound thinking, as the digitization of business continues to present new ways to capture data from trading partners and customers. The industry acknowledges that the current way of doing business is not sufficient. In a world of interdependencies and intertwined relationships, we rely on an astounding amount of guesswork and approximations to forecast and plan. But contrary to common theory, the underlying issue is not a need for more data.

Yes, more data can certainly be beneficial. Sourcing it from third-party sources is interesting and it can help improve your understanding of the supply chain. But the misconception is that you must look beyond your four walls to gain intelligent insights. Multiple data touch-points and IoT-sourced data offers exciting opportunities but in the shipping industry, there's value within the data you already hold. This data can provide proactive, predictive analytics. External data feeds are great add-ons, but you can obtain intelligent insights from existing, in-house data if you have the systems to make sense of it.

True Predictive Logistics requires a different approach. It requires digging beneath the surface of the supply chain to examine the underpinnings of global trade behaviors and flows. Doing so allows granular examination of the historic patterns and performance between each node in the supply network. By running thousands of simulations to calculate probabilities for every trade event, predictive logistics can deliver insights that are tremendously more accurate than traditional methods.

Data already comes in from multiple feeds: 315s, booking events, POs, etc. Organizing all of that data, sequencing it, and storing it in a relational database is foundational. This starts with mapping out the relationships of the network and matching those nodes to specific events.

This is easier said than done. The state of information in the global supply chain is a barrier. Put frankly, data is dirty and fragmented. It comes in different formats and languages, out of sequence and missing facts, which prevents intermingling and analysis. A prerequisite to deep foundation-level data analysis is exhaustive data cleansing to harmonize information and place it into context that is actionable. Properly sequencing data, removing duplications and triangulating to fill in blanks are essential steps prior to feeding an industry-tailored simulation and machine learning engine. But it can be done.

Toppling Misconception #2:
Not all Machine Learning is Created Equal

There is a misconception that machine learning is a magic bullet to solve all problems -- that it is a box you can buy, plug in, and deploy, and that the mere presence of machine learning technology makes for a sophisticated solution. However, this isn't exactly true. First, understand that machine learning is not an algorithm or even a set of algorithms, but actually a computing approach where computers hold the ability to learn without being explicitly programmed. It's easiest to think about machine learning having two premises: 1) rather than looking at prescribed relationships between data, the computer uses all the data to test and discover relationships and patterns of data on its own and 2) that with every new piece of data, the computer learns and gets 'smarter'.

In addition to there not being just one machine learning algorithm that solves all problems, the reality is that the effectiveness of using machine learning to solve complex problems lies in how you apply and customize the set of machine learning algorithms to a particular problem given your deep expertise. This is precisely why knowledge of only machine learning doesn't cut it. You have to have deep knowledge about the problem at hand.

The best way to apply machine learning to improve logistics is actually to run machine learning models on every single behavioral event (e.g. booking) and movement event in the entire supply chain, end-to-end. At every event type it should be determined which type of machine learning model to use (there are many). Then, each machine learning algorithm should be customized for that scenario based on deep industry expertise. And if only machine learning is being used, then the solution may likely still fall short. There is a whole set of data science techniques to consider and, more importantly, a proprietary simulation engine is needed to find the most probabilistic models before a supply chain professional would want to execute.

In short, machine learning is the proper type of technology to use to solve complex problems in highly dynamic environments like the supply chain. But more important than the talk or mere presence of machine learning and AI is how well these techniques are applied, how industry expertise is infused, and how a fundamentally different approach is used.

4 Building Blocks for Success

Despite prevalence of one-dimensional insights from BI and visibility tools, and broad claims around artificial intelligence and machine learning, it is important to recognize that the critical need to mine, model, simulate and predict global logistics in real time requires four fundamental elements:

1. Understand the Data: Robust data ingestion capabilities are needed to ingest and cleanly structure data from multiple sources

2. AI / ML: Machine learning offers a fundamentally different approach to interpreting data, recognizing complex patterns between parties and events, and dynamically generating highly accurate predictions

3. Simulation: An engine for running what-if scenarios and analyzing all events and outcomes is essential. Machine learning, alone, is often insufficient.

4. Industry-Expertise: To apply this advanced technology, a set of industry-tailored solutions are needed to empower ocean carriers, freight forwarders, 3PLs, terminal operators and shippers to get the predictions they need to make optimal business decisions. Beware that AI is not simply a box you can buy, plug-in, and have work without it having been crafted for the nuances of this specific industry.

Without these foundational elements, the supply chain will continue to rely on manual processes, spreadsheets, pivot tables and guesswork. Predictions and forecasts will continue to be painfully wrong and so too will the operational decisions they depend on. However, it has been proven that when global trade data is run through a powerful data intelligence platform, the value and impact is unparalleled. Predictive Logistics is revolutionary for the industry.

www.clearmetal.com
info@clearmetal.com
+1-415-857-4390

About ClearMetal

ClearMetal is the premier provider of AI-based Predictive Logistics. We deploy data science and AI to unlock efficiencies for global trade. Developed by top software engineers from Stanford University and Silicon Valley, ClearMetal's Intelligence Platform predicts nearly all events in freight booking and transport.

ClearMetal enables asset allocation and trade management decisions that deliver unparalleled profitability gains for carriers, forwarders, 3PLs, terminal operators and shippers.

" ClearMetal places the power of artificial intelligence and machine learning into our hands, providing unprecedented visibility and predictive intelligence. Actionable data insights are an opportunity to offer truly differentiated services to shipper and carrier partners. "

-- Jörg Twachtmann, Head of Global Ocean Freight at Panalpina