



# ENSURING THE COMPETITIVE STRENGTH OF YOUR GLOBAL SUPPLY CHAIN— ALGORITHMICALLY.

A CLEARPRISM WHITE PAPER

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## EXECUTIVE SUMMARY:

Global supply chains are increasingly complex underpinned by an ever-increasing number of activities, locations and partners. Effective supply chains are only as strong as their weakest – most vulnerable – links. A changing competitive environment always creates pressures on and opportunities for different parts of such a chain. Insight into what potential pressures (and opportunities) may exist – and most critically, what to do about them - as a result of the ever-changing competitive environment becomes imperative to maintain and certain strengthen one’s supply chain.

Highly resilient and effective supply chain systems use algorithms and data to identify the “faint signals” of potential pressure and model the operational, technical and financial implications of these pressures on specific areas of a business – whether processes, capabilities, partner networks, technology spend and/or workforce. Major shocks cannot be predicted or prevented, but their impact can be mitigated in resilient and effective supply chain systems.

Strengthening the resilience and effectiveness of global supply chain involves answering four questions

1. What are the faint signals of external events that impact the supply chain?
2. What processes and capabilities are they likely to impact and how much?
3. What are the operational, financial and technology implications of these potential impacts?
4. What actions should be taken to ensure ongoing resilience and effectiveness of the global supply chain?

The traditional way to answer these questions tends to be based on human experience, excel, (with some regressions) and PowerPoint. However, the dynamic inter-connectedness of hundreds of activities, involving thousands of stakeholders, and impacted by millions of external events requires algorithmic methods and data to identify the ‘faint signals’ of potential very real impact on their supply chain. Such insight, as early as possible, is critical to turn these potential pressure points into competitive strengths.

Yet, and this cannot be over-emphasized: Insight is not enough. It is only Step 1 of a critical 3-step program. Step 2 requires being able to pinpoint specific areas impacted by these pressure points – on specific capabilities, technology investments, partner networks, workforce, capital spend, and so on. Once one has Step 2 under control, Step 3 can be taken – involving a range of options regarding what to do about these pressures, whether to mitigate their risks or transform them into opportunities.

Being able to get such insight on pressures and explore their implications **algorithmically** is imperative for today and tomorrow's market leaders. This is the essence of Algorithmic Strategy for global supply chain.

The CapSCM algorithmic platform from Cleareye.ai provides algorithmic insights – and focus - to manage the critical vulnerabilities of global supply chain systems.

## KEY OBJECTIVES UNDERLYING A GLOBAL SUPPLY CHAIN:

The objective: *To strengthen the resilience and effectiveness of one's global supply chain under different conditions. powered by an algorithmic platform enabling ongoing monitoring and clarity of operational, technical and financial implications of one's ever-changing competitive environment.*

Meeting this objective involves asking and answering four questions:

1. **Faint Signals:** what external activities might impact our global supply chain given changes in our competitive environment? Where:
  - o **Activities in our competitive environment** include macro-economic, political / regulatory, start-ups, and/or competitor moves
2. **Impacts on:** Which stages / processes & capabilities underlying the supply chain are they likely to impact, **and** how much is the potential economic and competitive impact?
3. **Implications of:** What are the operational, financial and technology implications of these potential impacts – with a specific focus on:
  - o The capabilities underlying these stages / processes
  - o The functional areas / departments impacted
  - o Technologies – specific ones used throughout
  - o Workforce engaged, and
  - o Partner network supporting our global supply chain.
4. **Recommendations:** What do we do about it to ensure the ongoing resilience and competitive effectiveness of our global supply chain?

These are common strategic supply chain questions. Answering them has material operational and resource allocation implications.

## BACKGROUND:

Global supply chains are increasingly complex underpinned by an ever-increasing number of activities, locations and partners. Effective supply chains are only as strong as their weakest – most vulnerable – links. A changing competitive environment

always creates pressures on and opportunities for different parts of such a chain. Such pressures, and opportunities, result from both external activities – e.g., start-ups, new technologies, regulations & tariffs, macro-economic behaviors, competitor moves – as well as internal decisions (e.g., the establishment of new partner relationships, capital re-allocation, product re-mix, etc.) Therefore, insight into what potential pressures (and opportunities) may exist – and most critically, what to do about them – as a result of the ever-changing competitive environment becomes imperative to maintain and certain strengthen one’s supply chain.

The question is: how do you do so?

A broad range of supply chain solutions exist – from real-time sensor-based monitoring systems to fully-integrated demand to source production systems. These solutions are computationally-supported with real-time production and monitoring analytics to support near-to-real-time production activities. They, in short, take advantage of today’s current technical (digital) capabilities.

However, and ironically, the strategic questions of how to anticipate, respond and transform dynamic pressures on different parts of one’s supply chain tend not to. They tend to be answered in a traditional, static way, based on human experience, excel and powerpoint. The most successful groups take a different approach – recognizing that the dynamic inter-connectedness of hundreds of activities, involving thousands of stakeholders, and impacted by millions of external events requires algorithmic methods and data to identify the ‘faint signals’ of potential very real impact on their supply chain. Such insight, as early as possible, is critical to turn these potential pressure points into competitive strengths.

Even in these days of companies using predictive technologies to anticipate events, many supply chain groups use conventional techniques that rely on hindsight. Rolling with the punches might work for a leader in an industry but when leadership is under threat, every part of the enterprise, especially supply chain, needs to acquire the capability of looking around the corner to anticipate changes.

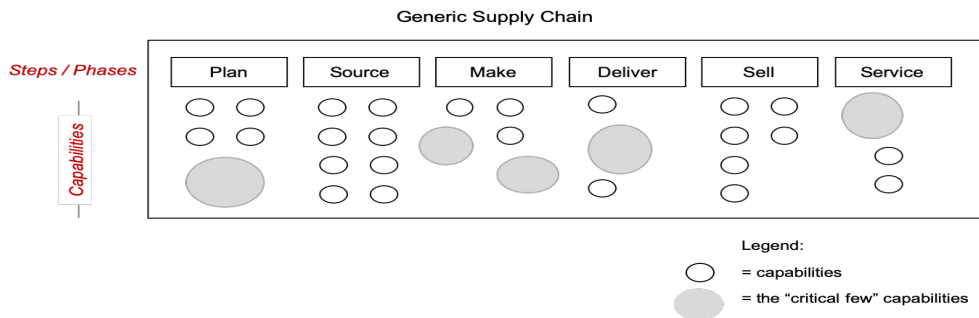
Having said this, major shocks from outside the supply chain might not be predicted. Who could have predicted Coronavirus, the trade war between South Korea and Japan, the Supermicro attack, etc.? However, having strong capabilities to detect/process faint signals and knowing the critical vulnerabilities and their impact on the supply chain strengthens the “organizational muscle” to identify patterns of potential impact.

Yet, and this cannot be over-emphasized: Insight is not enough. It is only Step 1 of a critical 3-step program. Step 2 requires being able to pinpoint specific areas of these pressure points – on specific capabilities, technology investments, partner networks, workforce, capital spend, and so on. Once one has Step 2 under control, Step 3 can be taken – involving a range of options regarding what to do about these pressures, whether to mitigate their risks or transform them into opportunities. Today’s leaders recognize that a “new way” needs to be taken to work through these steps quickly. This new way is actually a well trodden path – in other industries – only now coming in the business-to-business world in general and supply chain insight and execution specifically. This new way is based on algorithmic insight and predictive analytics.

## HOW STRATEGIC SUPPLY CHAIN QUESTIONS CAN BE ALGORITHMICALLY ANSWERED

All organizations – and processes – are composed of assets / capabilities. A global supply chain is no different. It consists of a certain number of phases each of which is made up of a number of activities and capabilities.

As is well known, of all the activities and capabilities underlying a global supply chain, only a few (we call it the critical 20%) drive the majority of economic value. It is these “critical few” that needs to be protected and enhanced while the remaining 80% need to be optimized.



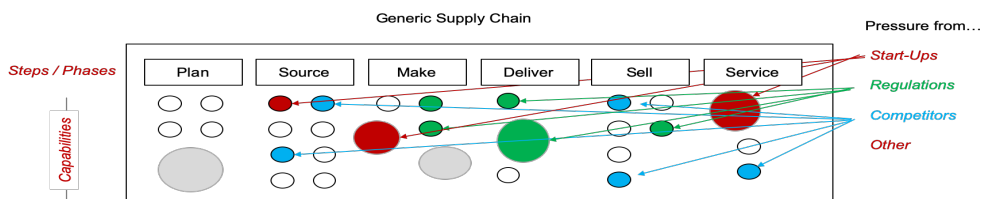
So, visibility into what makes up this “critical few” is important to ensure ongoing competitive strength and relevance.

And, here it gets particularly compelling.

As the competitive environment changes (which is always!), two things happen:

1. There is always pressure from external activities – e.g., competitor moves, regulations, macro-economic conditions start-ups, whatever – on different parts of your global chain.

Visibility into what these pressures are and what parts of your chain they are likely to impact, by how much, is critical for understand their potential impacts on cash flow, processes, technology, partner / supplier networks, workforce and capital allocation (among other perspectives).



2. There is a “decay rate” of competitive relevance on the critical few capabilities as a result of these pressures. In parallel, there will be the emergence of “a critical few capabilities” – a “new 20%” – underlying the competitive strengthen of your process.

Visibility into:

- a. What these “decay” and “adoption rates” are

- b. What (and who) are driving them, and
- c. What to do about them...

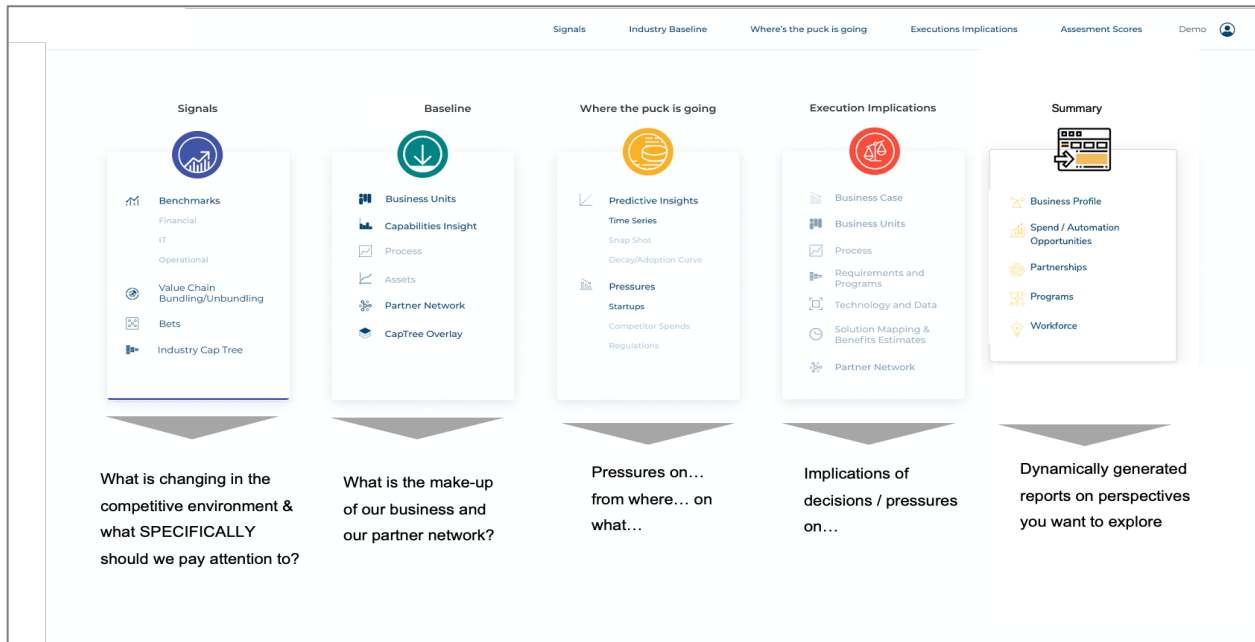
... is critical to stay ahead of the ever-changing shifts in the competitive environment.

And being able to do so *algorithmically* is imperative for today and tomorrow’s market leaders.

*And that is what we provide – algorithmically-driven strategic and operational insight to answer the critical 4 questions underlying a global supply chain strategy & execution program.*

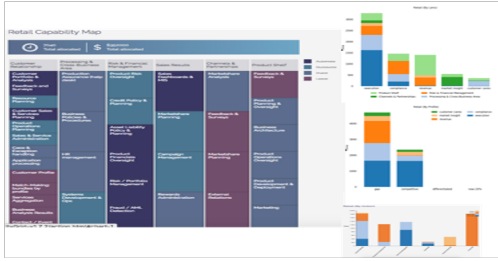
## OUR PLATFORM—POWERED BY NLP, MACHINE LEARNING AND VISUALIZATION

Figure 1 below displays the set of functionalities that makes up our algorithmic-based platform we call CapSCM. Following figures provide examples of some of the models and types of insights delivered.



## Baseline - Global Supply Chain Process

### Supply Chain Process & Underlying Capabilities



#### What it provides

- Depiction of process in terms of phases & functional areas involved – "sets of capabilities"
- Different colors reflect different perspectives "into" the capabilities that make up the process – e.g.,
  - Competitive Parity – are you ahead or behind competitors
  - Focus – e.g., do these capabilities drive revenue, customer support, compliance, inventory turns... or what
  - Spend – e.g., what % of these areas are addressable,

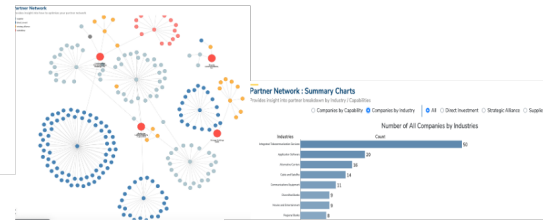
#### Why it matters

- **Establishes baseline** of what you have – necessary as you explore 'what ifs' regarding different programs / capital allocation ideas...

#### Questions answered

1. What is the supply chain and its underlying capabilities?
2. Which ones drive more "value"?
3. What is our partner network & what capabilities do they bring to which parts of the process?
4. What opportunities exist to optimize our partner network? Where? How?

### Partner Network



#### What it provides

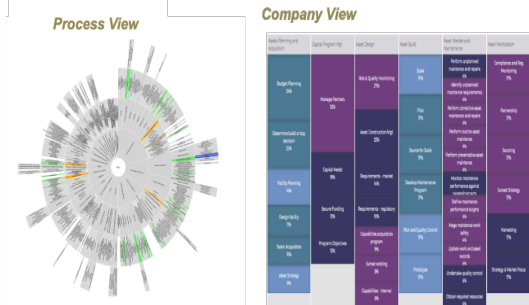
- Insight into partner network and their / its capability profile
- Depiction of which partners we use where, to do what

#### Why it matters

- **Identifies capabilities at risk** / under pressure / new ones to focus on
- **Identifies partners / areas for leverage**
- **Optimizes network**

## Signals – two examples

### Pressures on...



#### What it provides

- Depiction of where start-ups, regulations and competitor spend are putting pressure on SPECIFIC capabilities of your companies

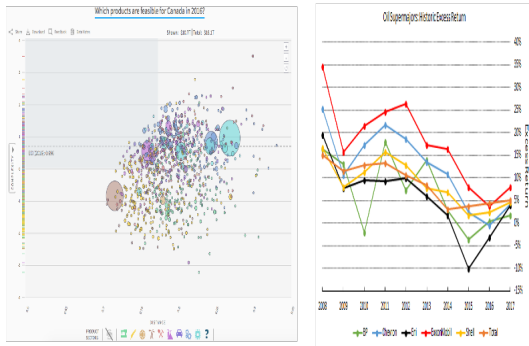
#### Why it matters

- Identifies – by #, time and \$ - which parts of your business are 'under pressure' by start-ups, competitors and regulations

#### Questions answered:

1. Which parts of our process – and partner network – are "under pressure" from start-ups, competitors, regulations?

### Outliers



#### What it provides

- Depiction of asset / capabilities outliers – potential new or declining value

#### Why it matters

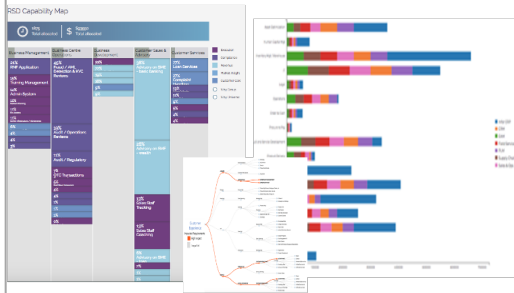
- Provides **focus** on potential new assets / capabilities to exploit
- Provides **quick competitive insight** into what's different

2. What are the operational, financial and technology implications of these pressures?



## Execution Implications – two examples

### Functional Areas / Requirements / Processes / Partner Network



#### What it provides

- Insight into what parts of the business (process : applications : data) are impacted by solutions / programs / investments

#### Why it matters

- Reduces execution risk

#### Questions answered

What are the implications of our investments / programs / recommendations on:

- Balance Sheet
- Business Unit Focus and Structure
- Business Processes
- Workforce deployment and enablement
- IT: Applications & Data
- Partner Network(s)

### Technology Stack : TCO



#### What it provides

- Insight into how our systems interact / depend on each other
- Visualization of system / application TCO, and how they are impacted by assets / solutions / programs

#### Why it matters

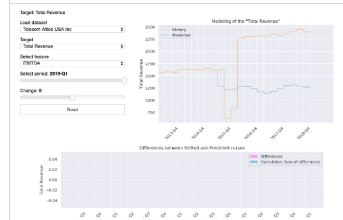
- Reduces risk in terms of execution efforts – e.g., if we touch system A, make sure we understand the implications on other systems it interacts with
- Clarifies impact on application stack, and consequently resource allocation as well as execution planning

## Where the Puck is Going - Predictive Models

### The 300 Predictive Model

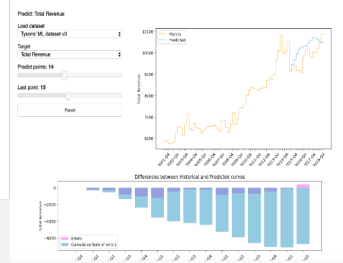
#### Prediction and target modeling

In this dashboard, for a given company's database, we can model the current (2018) by changing features. To see the same as a scenario test, the play with features' values to see if their scenarios. How the target reacts to our changes.



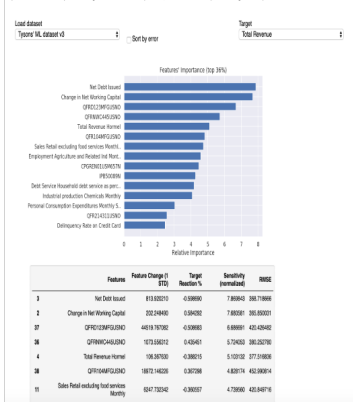
#### Prediction

In this dashboard, for a given company's database, we can play with the length of the prediction. How many periods ahead we can predict the target from the feature. Some time there are changes when a shifting point for the history and when in the prediction to update the predicted and the current. This course is a validation part to compare how good the prediction is.



#### Features' Importance / Sensitivity Report

In this dashboard for a given database, we calculate and show the Features' Importance diagram. It is also called the Sensitivity Report. Features are columns in the dataset. The model uses features to predict the target. The target here is the company's Total Revenue. The feature importance tells us how much each feature plays in the dataset being the predictor power into the predictor of the target. Or you can say how much every feature impacts the predicted value! This report shed a light into the features' importance, how each feature impacts the target and helps to reduce irrelevant data in the dataset.



#### What it provides

- Predictive insights into economic performance over 1-3 years as measured by:

- Revenue growth
- Net Income
- EBIDTA
- Cost of Capital
- ...

- Insight into the critical capabilities that **have driven** and are **likely to drive** financial measures – e.g., Revenue, EBIDTA... - under different conditions

#### Why it matters

- Isolates critical capabilities that move different economic needles under different conditions

#### Questions answered

What are potential economic implications under different conditions... &... what are the critical capabilities driving them?

Each of the models above are in service of creating visibility into your global supply chain from different perspectives.



Such visibility into the activities, areas of potential impact, and implications of them strengthens your capability both to anticipate and to adapt to the ever-changing competitive environment.

## **CLEAR EYE'S CAPSCM PLATFORM—SUMMARY: ENABLING AND ALGORITHMICALLY-DRIVEN SUPPLY CHAIN STRATEGY**

The objective of a global supply chain strategic is straightforward: *To strengthen the resilience and effectiveness of one's global supply chain under different conditions.*

Doing so requires into what might impact that chain, where, how much, with insight into the implications of those impacts on cash flow, process, partners, technology and workforce. Given our ever-changing competitive environment, being able to get the visibility into:

1. Different types / sources of pressure
2. Implications of these pressures from different perspectives on your business and partner network
3. With insight into financial and resource allocation implications, and arguably, most importantly,
4. Insights into what you might do both to anticipate and redress them.

The CapSCM platform provides is a set of visualizations and algorithmic insights into emerging sources of pressures, their implications and the critical areas to remediate / get ahead of them on an ongoing manner, with the data accumulated enriching the database(s) and algorithmic insights as the platform gets smarter and smarter the more it's used.

The platform provides, at its essence, 3 capabilities to support the 4 key questions underlying a global supply chain strategy:

1. Dashboard – and insight into what impacts what, where and by who much (visibility)
2. Monitoring – of faint signals *\*before\** they hit you, and
3. Operational execution planning capability to mitigate / manage such risks and their implications.

Below is the high level method to the madness of setting up and deploying the CapSCM platform.

