

FIRST ANALYTICS®

Product Vulnerability Assessment

AN ANALYTICS-BASED SERVICE FOR ASSESSING PRODUCT & PART LEVEL
SUPPLY CHAIN VULNERABILITIES



How Resilient is your Supply Chain?

Harvard Business Review

Global Supply Chains in a Post-Pandemic World

The challenge for companies will be to make their supply chains more resilient without weakening their competitiveness. To meet that challenge, managers should first understand their vulnerabilities and then consider a number of steps—some of which they should have taken long before the pandemic struck.

<https://hbr.org/2020/09/global-supply-chains-in-a-post-pandemic-world>

Businesses need a deeper understanding of supply chain vulnerabilities – and ways to fix them

- Resilient & responsive supply chains will be a competitive requirement in the future
- New tools utilizing advanced analytics can help identify vulnerabilities and identify remedies

CNBC

Big business bosses are warning that supply chain issues and inflation are here to stay

“It will be a really core competence of companies like us, making sure that you can manage these scarcities and issues on the supply chain, not only on the material but also on the logistics side.”

<https://www.cnbc.com/2021/11/10/big-business-bosses-are-warning-that-supply-chain-issues-and-inflation-are-here-to-stay.html>

Supply chain challenges will be ongoing – the pandemic was just the latest ‘wake up call’

- Companies and academics need to rethink supply chain fundamental assumptions
- Responsive supply chains of the future will not over-index on JIT and Lean



Which of your Products are Most Vulnerable?

CNBC

Glass bottle shortages put pressure on wine and spirits companies

“Some of the large distillers, even though they have multiyear contracts for millions of bottles, they’re finding in some instances that they have to pick and choose as to which bottle sizes they’re going to get,” Ozgo said. This could eventually lead to even tighter supplies of smaller-volume bottles down the line because the emphasis will likely go on the more popular sizes, the 750 milliliter and the 1.75 liter.

<https://www.cnbc.com/2021/11/23/glass-bottle-shortages-pressure-wine-and-spirits-companies.html>

Components upstream can impact several product lines

- Attributes regarding lead times, multi-sourcing, and contracted quantities can provide a start to vulnerability assessment
- Examination of distributions of performance metrics (expedited orders, lead time adherence, manufacturing adherence) provide additional context

MarketWatch

Sweet potato woes

The Wall Street Journal noted that supplies of food and household items are 4% to 11% lower than normal, as of Oct. 31. Turkeys were over 60% out of stock; cans of cranberry sauce are 20% out of stock and in decline; supplies of yams and sweet potatoes are a quarter out of stock and refrigerated pies will tie with turkeys as the holiday foods most out of stock this Thanksgiving.

<https://www.marketwatch.com/story/sweet-potato-woes-if-you-cant-find-your-holiday-ingredients-you-might-have-to-wing-it-11637355265>

High demand variation or highly seasonal product demand can add elevated risk to products

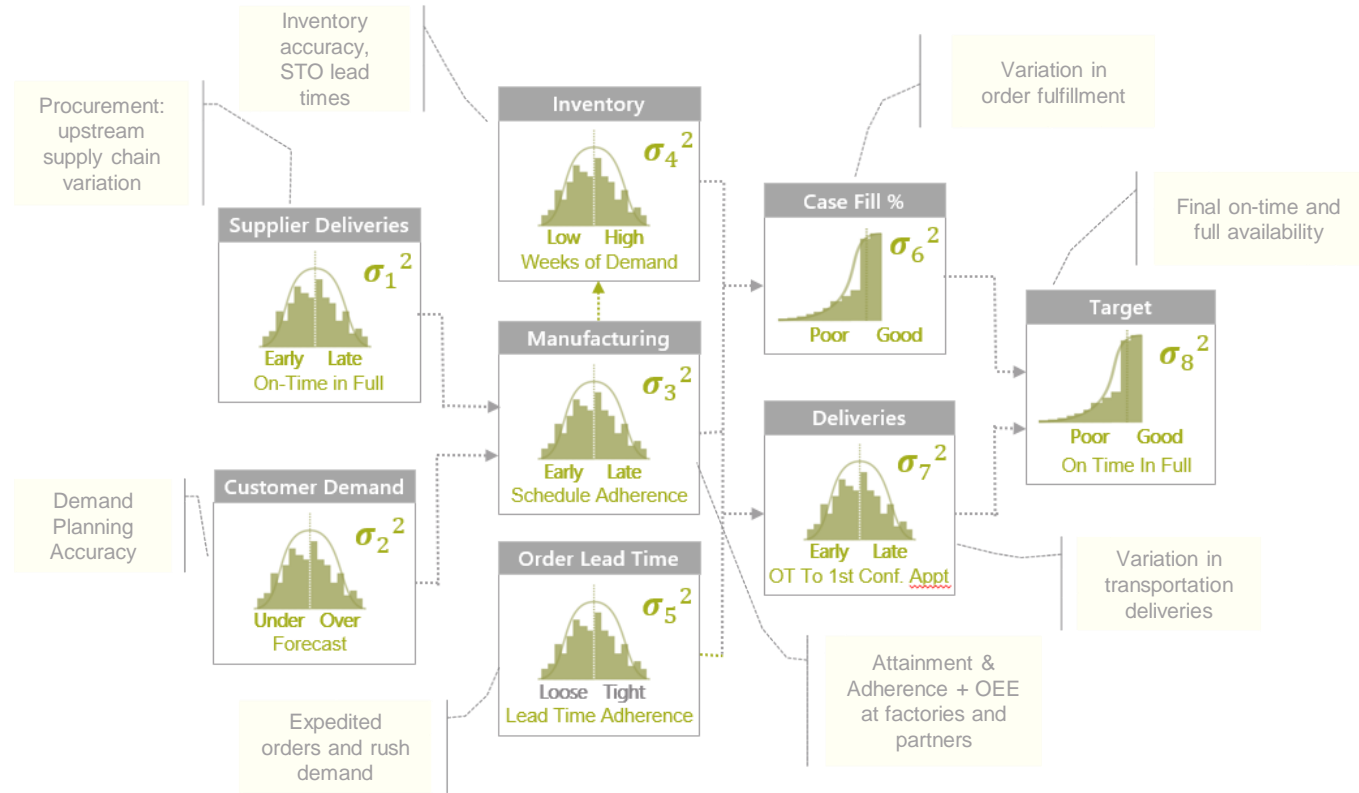
- Missing Autumn for pumpkin spiced products or inability to deliver cold weather related components in winter add additional levels of vulnerability to products
- Examination of seasonal demand or high coefficients of variations provide attribute values for SKU vulnerability.



Variation in Multi-Echelon Supply Chains

Assessing supply chain resilience through End to End (E2E) variation modeling

- Components, assemblies, and finished products have associated performance metrics through the E2E supply chain functions
- Combining data across functional silos identifies E2E sources of variation and vulnerabilities at a component level
- With data mining and statistical techniques, components can be classified using these performance metrics combined with attribute data

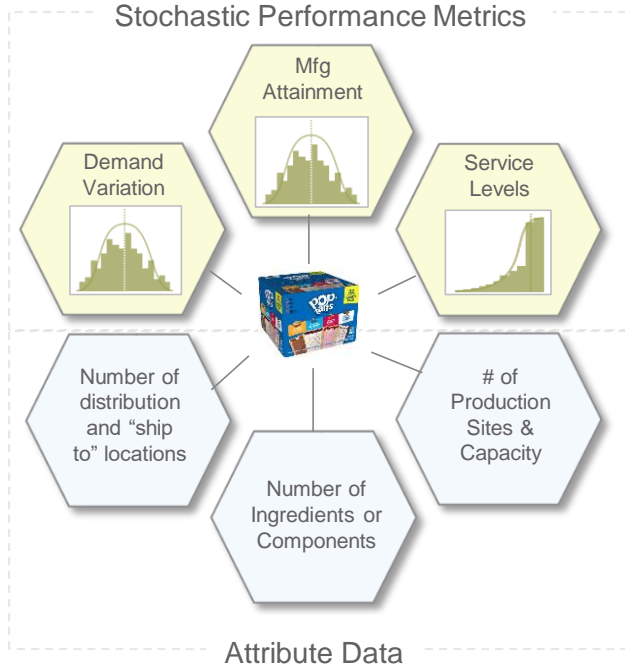


A Parts or Product Level Vulnerability Assessment

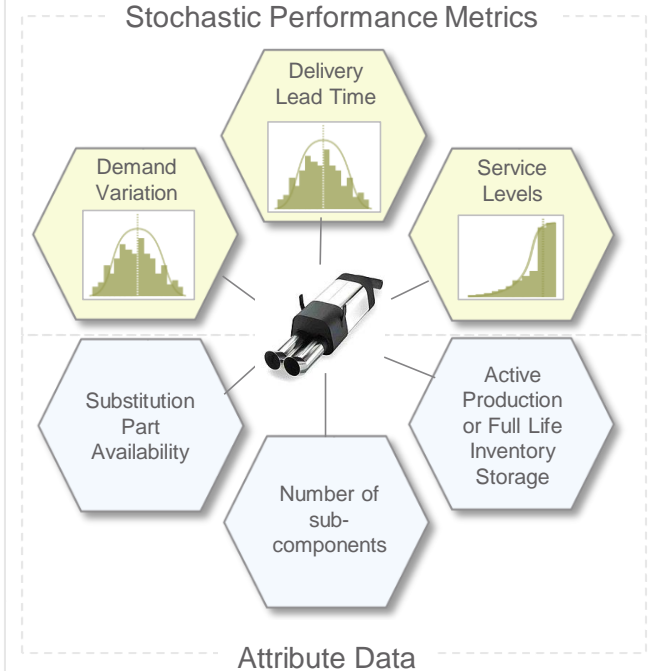
Assessing individual product or component vulnerabilities with our assessment 'engine'

- Whether your industry is focused on FMCPG, durable goods, or service parts and assemblies, a common data mining approach is utilized
- We have a standard data format for the intake of your attribute and performance data to populate our models
- The output analytics include standard reports as well as interactive data visualizations for ad-hoc analysis and filtering.

Fast Moving Consumer Packaged Goods



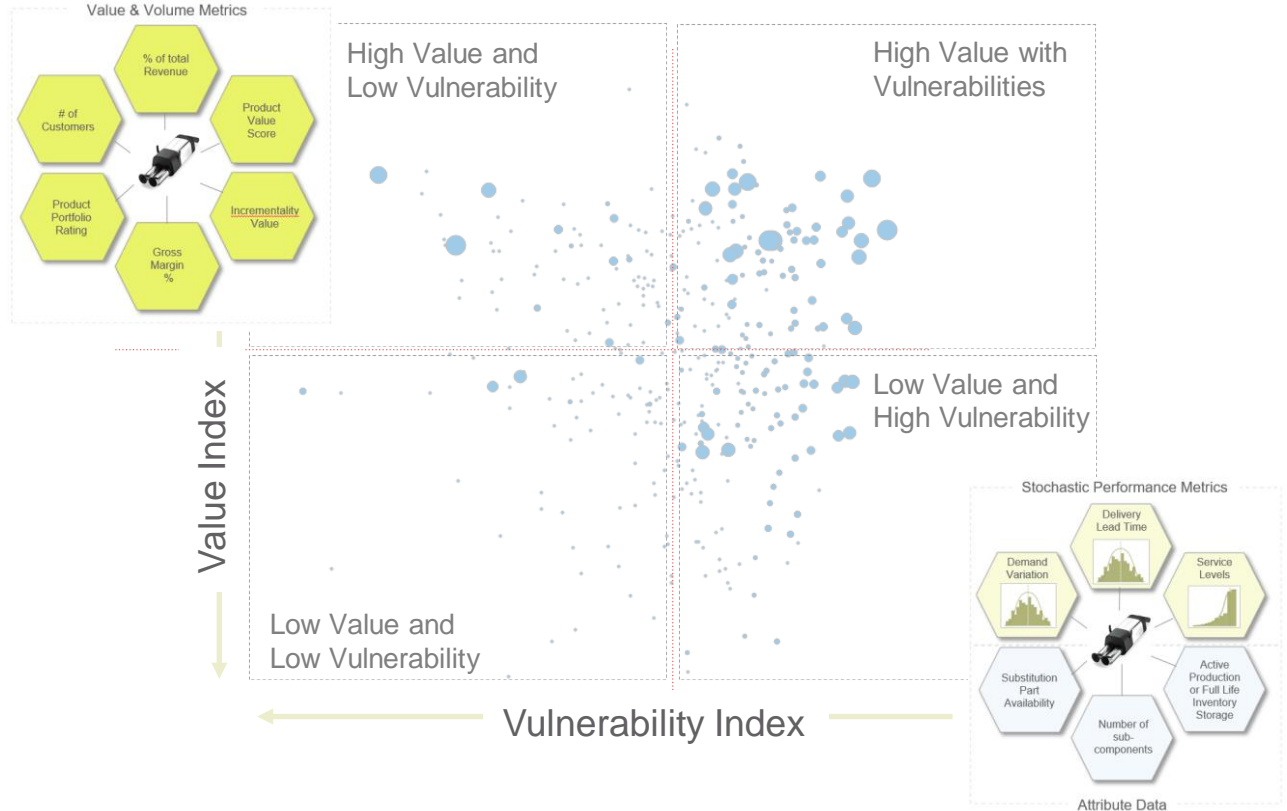
Service Parts, Assemblies, Durable Goods



A Parts or Product Level Vulnerability Assessment

Assessing risk and impact through addition of value components

- Mining the provided data provides a risk assessment vulnerability assessment as one component
- Coupling value elements of revenue, margin, and product value allows a more thorough segmentation of SKUs
- The resulting segmentation differentiates SKUs by risk and value and provides appropriate recommended actions and 'SKU scorecards'



Our Methods

We combine human content analysis and insights with automated analytics

- Analytics alone provide one view of vulnerability, but human content analysis through the Delphi method and questionnaires collected during workshops add additional attributes for our models
- Parameterizations in the resulting tools (dashboards) allow for indexing higher on human content analysis or data analytics for different views of the same underlying model data.

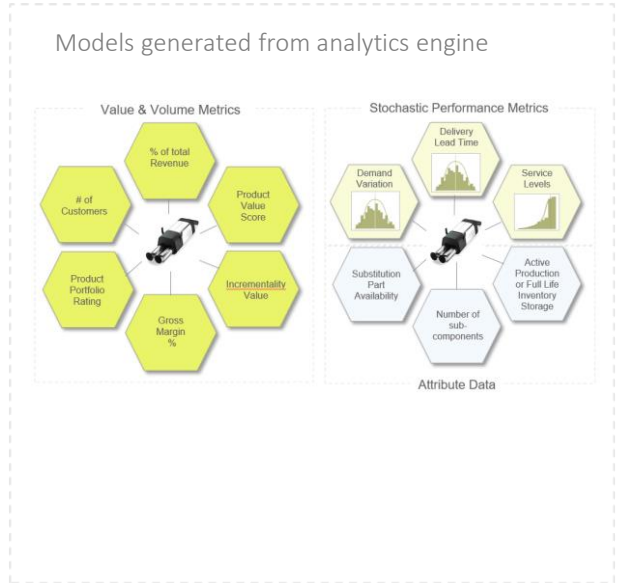
Survey Results from Workshop



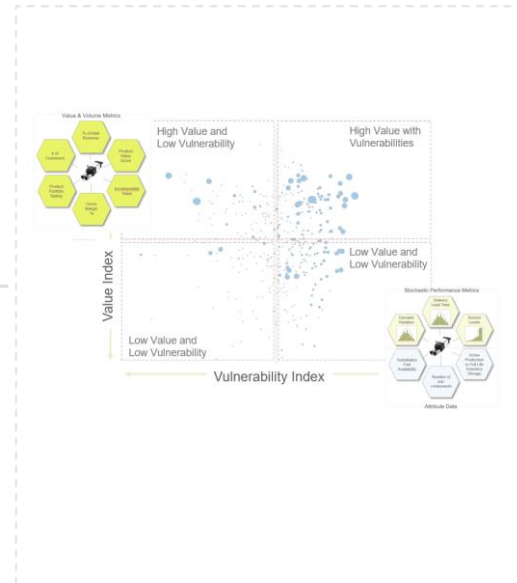
Data Extracts Provided by Customer



Analytics Engine & Assessment Libraries



Assessment Dashboard & Reports



Our Approach



Objectives

- Assess through a workshop and guided questionnaire general supply chain concepts and metrics for your business (how you define value, criticality)
- Collect and collate data from your systems for a product level 'meta-model'
- Create assessment dashboard & scenario tool highlighting high level supply chain vulnerabilities & recommendations



Activities

- Workshop and guided questionnaire
- Data collection through standard forms and uploads
- Data ingestion, model application, configuration
- Analysis of results, validation & verification
- Review of results – wrap-up workshop & deliverables



Deliverables

Supply Chain assessment questionnaire results

Meta-data model of SKU or parts level attribute data and distribution analysis of key metrics

Dashboard of supply chain vulnerabilities and potential remedies

Output result of data quality assessment, key findings, outliers, and suggested actions

Ongoing access to analysis tool of vulnerabilities based on 'stress testing' scenarios

