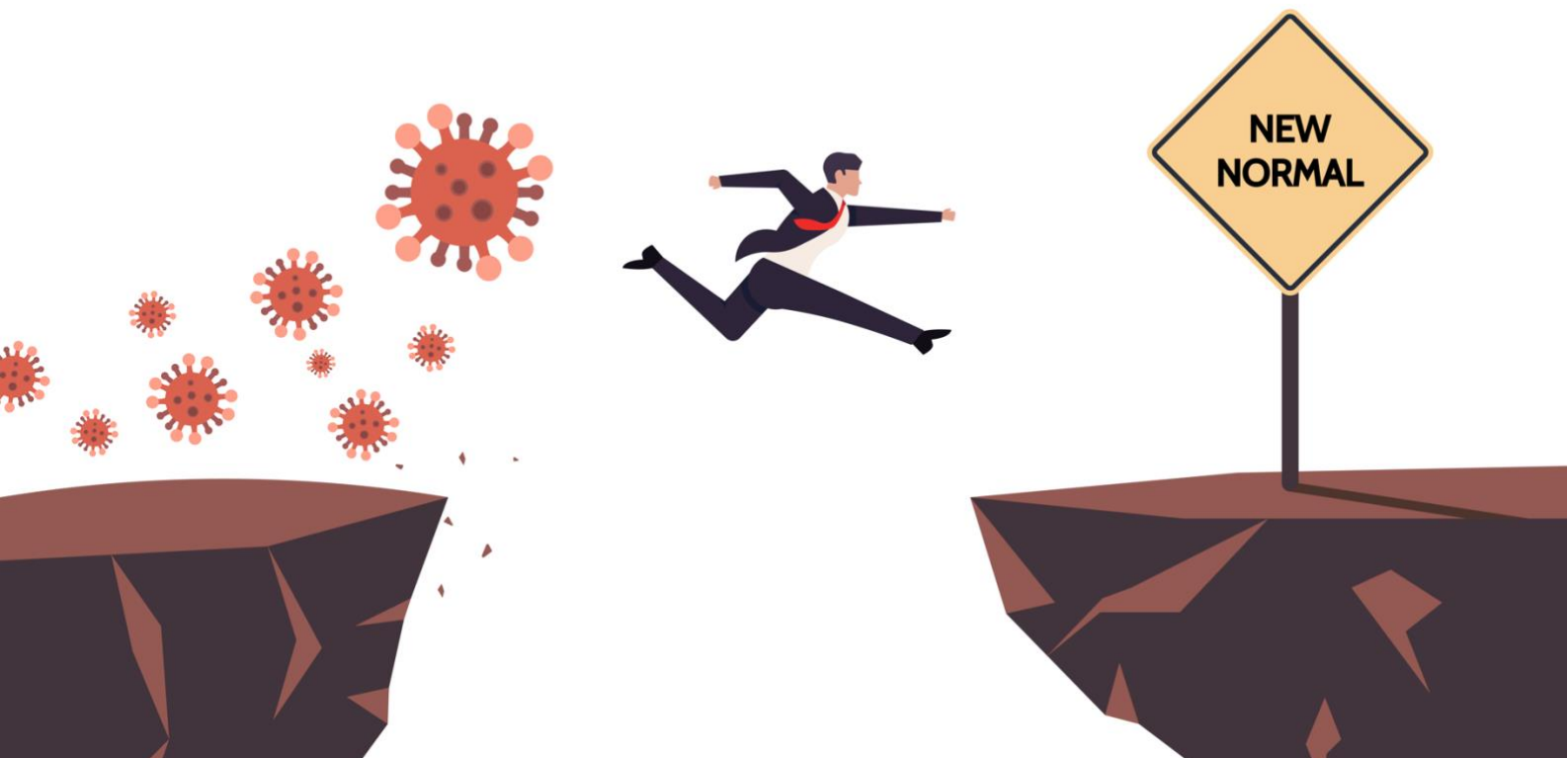# archlet

Sourcing Optimization

From Survive to Thrive
in the New Normal

White Paper

May 2020

Introduction

For many firms, the COVID-19 crisis has triggered a massive shock across their global supply chain. They must now re-think their entire value chain in light of the new normal.

External shocks have always been a catalyst for supply chain redesign, and innovation. Although business continuity plans exist, they may not be comprehensive enough or up to date – typically, in flourishing times they focus on increasing revenues and margins, and not on minimizing supply chain risks.

Today's crisis is forcing companies to scrutinize end-to-end supply chain transparency and to adjust their sourcing and supply chain strategies.

Many global corporates have been through this before – substantially changing their supply chain to ensure supply after a crisis. It can be a particularly challenging exercise for companies that rely heavily on single sourcing and may also lack visibility of suppliers beyond tier 1.

Hurricane Rita (2005)

Hurricane Rita caused oil-refining assets in affected regions of the US to shut down. This had an immediate impact on the consumer packaged-goods industry and production ground to a halt. The supply of the raw material that was needed to produce packaging was missing, so many buyers were forced to create new sourcing strategies and include alternative packaging designs in their bid sheets. This caused companies to switch from resin-based casings to packaging made of recycled paper or cardboard.
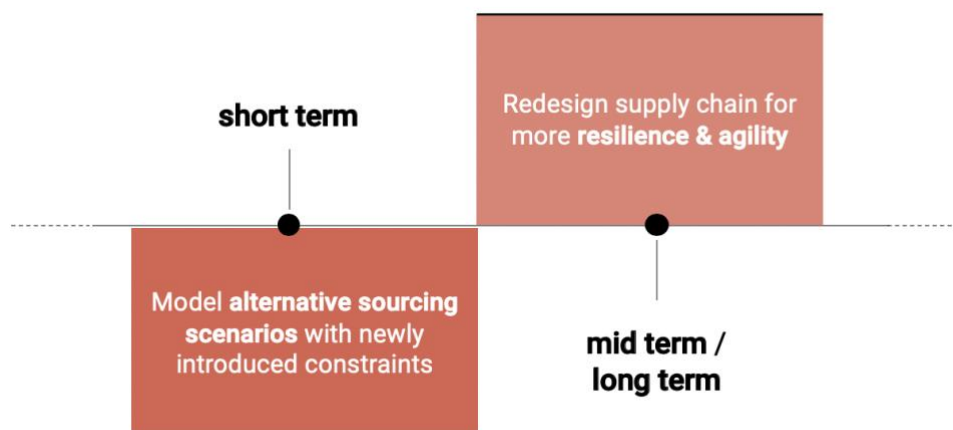
Sourcing Optimization For The New Reality

In contrast to past crisis situations, COVID-19 affects supply chains not only on local but on a global scale. Irrespective of this, crisis' have one thing in common: They introduce many new supply chain constraints.

In response to a crisis, companies are forced to manage these new supply chain constraints when conducting sourcing activities to rearrange supplier networks. This can make it difficult for procurement teams to make supplier decisions quickly and cost-effectively.

However, a sourcing optimization engine can lighten the load. It supports companies to evaluate different sourcing options, while also running comprehensive scenario analyses. By making use of mathematical optimization and advanced analytics, all additional boundary conditions can be considered, and alternative sourcing scenarios created within just a few clicks.

At Archlet, we have identified three approaches where sourcing optimization can help companies reach the new normal in the best possible way, by maximizing savings and minimizing risks. The steps are divided into short-term and mid-/long-term actions.

1. Model New Scenarios With New Constraints

The COVID-19 crisis introduces several additional constraints to be taken into consideration for any upcoming awarding decision.

Here are some examples:

Geographical constraints – avoid suppliers in certain countries for a specific time period due to high supply chain risks. Consider duties, VAT and tariffs of new countries

Liquidity constraints – payment term optimization and the impact of direct cash flow for example prefer suppliers with longer payment terms

Capacity constraints – consider capacity limitations of suppliers due to missing or delayed supply

Raw material restrictions – quickly enable suppliers to come up with alternative or innovative design choices to reduce, change or mix production materials

Logistics constraints – to reduce risk, use third-party logistics firms that will take liabilities, rather than individual transportation providers

Companies without advanced optimization capabilities might try to include the additionally introduced boundary conditions in Excel spreadsheets. This will entail buyers spending a lot of time trying to derive the best possible short-term adjustments within their existing supply base. But linear optimization solutions can remove the legwork: sourcing optimization allows companies to model new and alternative scenarios quickly while also considering the boundary conditions introduced by the crisis.

2. Redesign For Resilience

Having multiple sources spreads the risk of a disruption among the involved suppliers.

In the best-case scenario, the geographic region of the primary source differs from that of the secondary source. However, many companies often rely on one supplier for a specific product.

The 'single sourcing' decision is driven by know-how or costs – having two or more suppliers for the same product usually increases administrative efforts, quality monitoring activity requirements and total costs (for example, economies of scale effects are reduced due to the lower volumes allocated to each source).

Companies that redesign their supply chains to mitigate risk need to ask the following fundamental questions:

How do I best split demand across multiple supply options?
How do I minimize my supplier risks while still optimizing my spend?

Building these scenarios in Excel is an extremely time-consuming and error-prone exercise that often fails to convince management to change the 'as-is' state.

Using sourcing optimization, the optimal split between incumbents and additional sources can be determined with the help of algorithms. The buyer can quickly model risk-diversification scenarios and identify the cost impact compared with the 'as-is' allocations. In addition, supplier risk scores provided by third-party providers (such as Riskmethods or Resilience360 by DHL) can be incorporated in the scenario analysis.

See *Case Study* on page 9 for more details.

3. Redesign for Agility

The third approach also focuses on a long-term supply chain redesign. The objective is to move from a global supply chain set-up to a more local or regional one.

The time horizon of this approach is mainly driven by local or regional suppliers having to set up new capacity. As outlined in point 2 above, the same effects on cost (increase) and risk (decrease) apply. However, logistic costs in a nearshore scenario are lower than they are for international routes, which involve goods and materials crossing oceans and many more country borders.

Sourcing optimization solutions can help buyers to find the best new scenarios with local/regional suppliers, including the optimal logistics network and routes.

Outlook

James B. Rice, deputy director of the MIT Center for Transportation & Logistics, states in the Harvard Business Review[1] that optimization is a dynamic process, not a one-time process. Firms should regularly revisit and challenge their scenario choices and the strategies that underpin them.

McKinsey & Company[2] also highlights that companies should now start focusing on building smarter, more flexible and especially more resilient supply chains.

With sourcing optimization solutions like the Archlet App, buyers can easily create and assess new sourcing scenarios based on cost and non-cost components. And these solutions are getting smarter all the time, due to their underlying algorithms.

As outlined in the Archlet blog post, *Intelligent sourcing automation – what does it take?* (April 2020), even more financial savings can be achieved as process automation techniques are leveraged to make sourcing smarter, easier, and faster than ever before.

Interested in a conversation? Reach out to Archlet and schedule a demo.

[1] https://hbr.org/2020/02/prepare-your-supply-chain-for-coronavirus
[2] https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/how-consumer-goods-companies-can-prepare-for-the-next-normal?cid=eml-web

About Us

Our mission is to help you accelerate your sourcing process by replacing error-prone and time-consuming offer collection through email and analysis in Excel.

Powered by advanced analytics and data science, our algorithms scan through all available supplier offers, quickly identify the optimal sourcing strategy and proactively support you with data-backed negotiations.

Our company originated from top-ranked[3] ETH Zurich and we all have a background in data science. We offer a cloud-based advanced sourcing solution to large enterprise clients and SMEs.

Our customers, coming from different industries, report financial savings of 5-15% compared to previous sourcing events. You can test our sourcing optimization solution in a pilot project before moving into a yearly license.

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[3] https://www.timeshighereducation.com/world-university-rankings/eth-zurich

Case Study: Technology Behind Sourcing Optimization

Initial Situation:
A mechanical engineering company wanted to illustrate the impact on costs and risks if all parts of their newly developed product were sourced from at least two suppliers.

In addition, the company intended to exclusively consider production plants in countries less affected by COVID-19. Therefore, the TCO[4] calculation had to be adjusted to incorporate the duties, VAT and tariffs of the newly introduced sourcing countries.

In total, the company needed to source 5 different parts for 2 production plants and had 4 suppliers providing quotes for a total of 10 line items[5].

What is the best possible sourcing scenario?

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[4] TCO = Total Cost of Ownership; Describes a financial estimate to help buyers determine direct & indirect costs
[5] Line Item = One item on an order; regardless of quantity

Problem:

Traditionally, the company would award suppliers based on the results from either the 'single sourcing' or the 'best price' scenario. These two scenarios can be easily illustrated in a spreadsheet. However, the company wanted to consider the new constraints described in the *Initial Situation* above and their Excel file quickly reached its limitations.

The buyer would need to check **1'048'576** combinations to be completely certain that the selected sourcing scenario is the best choice in any case.

Mathematical explanation

This problem describes a combinatorial complexity. Most likely, the majority of readers might have guessed that the possible options are 6 x 2 x 4 and equal the number 48.

However, as this is an exponential problem, even in this simple setup, a buyer would need to compare 4^{10} possibilities – resulting in 1'048'576 options. With every additional line item, the options increase rapidly. For example, for 12 line items (6 different products and 2 production sites), the number skyrockets to 16'777'216 = 4^{12}.
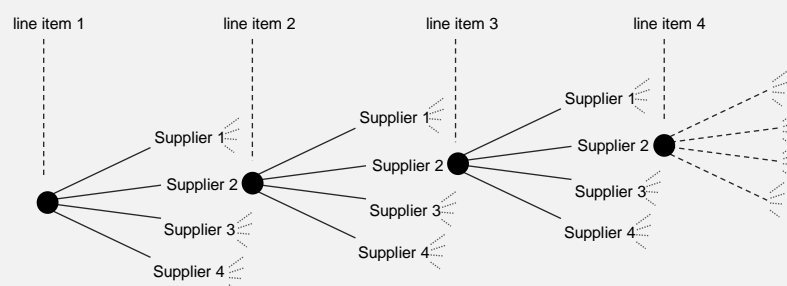
Graphical explanation

For each line item the buyer needs to decide who to work with. There are always four options to choose from, ranging from Supplier 1 to 4.

Once a supplier is selected, the same procedure has to be applied to the other line items.

But, every decision made by the buyer needs to be verified based on the previously defined boundary conditions and constraints cannot be violated.

With the help of a large decision tree, this problem can be illustrated graphically. The drawing below indicates one possible decision route along the branches of the tree.

Solution:
With the help of the Archlet sourcing optimization tool, the buyer was able to create all desired sourcing scenarios within a few clicks.

Here are some examples of created scenarios:

Single Sourcing Scenario – award only 1 supplier for all line items

Best Price Scenario – always consider the cheapest supplier per line item, the number of suppliers increases, risk score climbs due to supplier changes on line item level and the non-consideration of geographic location of suppliers

Scenario 1 – take two suppliers per line item and calculate the optimal split of demand (for example 40% to supplier 1 and 60% to supplier 2)

Scenario 2 – consider production sites in countries with low impact by COVID-19, constraints from Scenario 1 are still in place, risk score drops to minimum.

Screenshot of the Scenario Overview page of the Archlet App. Schedule Demo *here* for more details.

The Archlet App is easy to use, does not require any set up time and also needs much less training than other sourcing optimization tools. Hence value generation starts right away.