



Optimization: What Comes Next?

A White Paper by Sourcing Innovation

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Introduction

Strategic Sourcing Decision Optimization (SSDO) has come a long way since it first hit the scene in 2000 at the tail-end of the Y2K crisis. In the early days, costs were typically limited to landed cost analysis -- unit, transportation, and maybe a few import/export charges; constraints to simple capacity constraints across a few commodities and a few distribution centers; and category size was limited to the seven or eight figure range. Today, models support extended acquisition and utilization cost models, a plethora of constraints across hundreds of locations and thousands of lanes, and dozens of categories that collectively constitute nine or ten digits worth of spend. A few of today's leading providers regularly optimize huge models in the one hundred million to ten billion dollar range that contain tens of thousands of variables and hundreds of thousands of equations in a matter of hours -- a model size and solution time that seemed unreachable in the early days.

Moreover, companies at the forefront of the application of strategic sourcing decision optimization are still saving an average of 10%+ year-over-year across the categories they apply optimization to. They're building models beyond the wildest dreams of their predecessors, looking at cost (unit, transportation, import/export, waste, etc.) and non-cost factors (defect rate, delivery time, risk factors, sustainability ratings, etc.) simultaneously, and optimizing for preferential award splits (such as 20/30/50%) across suppliers, locations, etc. They are optimizing traditional direct categories, indirect categories, and even the sacred-cow categories of marketing, legal, and human resources (for temporary labour). For these organizations, strategic sourcing decision optimization still brings the **Midas Touch** to their categories.

Do these organizations want to do more? Could it get better? The answer is **YES**.

The reality is that, due to limited adoption (by only the cream of the crop of Supply Management organizations), and the relatively few vendors offering true strategic sourcing decision optimization (as there has never been more than seven vendors with true SSDO capabilities at any one time since the technology's inception), strategic sourcing decision optimization is still in its infancy. We have not even reached the optimization 2.0 plateau yet! For those organizations ambitious enough to embark on a next level sourcing optimization journey, the best is yet to come.

What will it take for a Supply Management organization to get to the next level of strategic sourcing decision optimization competency? Leadership, knowledge, modern technology, new methodologies, execution, and the **tenacity** to get it done.

Will every organization cross the chasm to reach the next level of sourcing optimization? Probably not, but those organizations that do reach the next level will return to the days where initial events on a category saved 30%! And they'll use the techniques described in this paper to do so. **Intrigued?**

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The Beginning of Optimization

In the 1990s, Procurement was focused entirely on unit cost and, before the appearance of sourcing technology, typically used the three-bids-and-a-buy methodology and bought from the supplier who delivered the lowest quote. This worked well when oil and transportation costs were low, but once these prices started to rise, the organization started to get burned when logistics had few choices for transportation because the supply/demand dynamic changed (as higher fuel costs drove some carriers out of business and forced others to focus on specific regions or routes where they could be profitable) and transportation costs started rising.

To try and contain these rapidly rising costs, Procurement shifted its focus from unit cost to landed cost, and asked suppliers to include shipping cost in their quote. However, Procurement still used the three-bids-and-a-buy methodology and awarded to the supplier with the lowest bid. Procurement was essentially treating a service function like a commodity buy.

While this appeared to contain costs for a while, especially when suppliers would quote based on the lowest shipping rates they could find, costs soon started to rise again. Suppliers, who realized that quoting low meant they would lose money on shipping before the contract was up, due to steadily increasing transportation costs, quickly started to increase their bids. In addition, because suppliers didn't want to get burned, they would pump up their margins beyond what they expected the maximum transportation cost would be, and buyers ended up paying the price.

So Procurement, under fire from Logistics for poor sourcing choices, and the C-Suite, for rising, instead of steady or falling, costs, goes back to unit bids but this time simultaneously requests transportation bids from the suppliers and 3PL carriers and then, with the help of Logistics, makes the award based on the lowest landed cost. This was better, but considering it was still using a modification of the three-bids-and-a-buy technique because Procurement still only asked three suppliers and three carriers for quotes on any given lane, because the organization still ran on paper¹, buyers still weren't getting the best deal, and, most importantly, the buyers didn't know it.

¹ At this time, most Procurement organizations did not have the means to capture large volumes of bids from a large number of suppliers because it was not until the mid-noughts that primitive e-RFX and e-Auction solutions were affordable by the average mid-size or large organization. Until the mid-noughts, even primitive e-RFX and e-Auction solutions cost in the high six figure to low seven figure range once the license fees, hosting and/or data center fees, support fees, and internet fees were added in -- and only the Fortune 500 could afford such solutions. Moreover, many suppliers had limited or no internet access, so even those organizations with e-RFX/e-Auction solutions would not use these solutions to their full advantage because the buying team would still have to enter all of the bids manually from a fax sheet and then enter them all again into their analysis spreadsheets.

Until, of course, the suppliers and carriers, realizing that they were losing sales if their prices weren't competitive enough to provide the buyer with the lowest landed cost, started offering discounts if a buyer reached a certain volume or total spend. Since these discounts weren't always simple calculations, some buyers fell for them and a few suppliers were awarded business they shouldn't have been awarded because, even with the discounts, the suppliers still weren't the lowest cost option.

And, after a year or so, smart buyers, looking at year-over-year spending trends, figured this out. So suppliers and carriers upped their game and started offering complex discounts. Ten percent off product X if the organization bought 10,000 units of product Y. Tiered discounts on combined spend across two or more items. And so on. All of a sudden, even with the aid of logistics and dedicated data analysts, buyers couldn't figure out the lowest costs with their spread-sheets and simple modeling tools no matter how much time they had. Buyers needed a better way.

Best-in-Class Optimization Today

That better way came in the year 2000 when a number of companies hit the marketplace offering first generation strategic sourcing decision optimization solutions. Progressive buyers could take a leap of faith and analyze multiple supplier bids, multiple carrier bids, multiple route options, multiple dependent delivery lanes, and multiple, tiered, discounts in a single sourcing event and identify savings even in tight categories. Furthermore, these buyers could analyze an entire category of related commodities from the same suppliers at the same time. And, in a matter of days (for a large model), or hours, for a smaller one, a buying organization could determine the lowest cost solution.

If the lowest-cost solution was not acceptable because it was awarding too much to a new supplier, over-relying on an untrusted carrier, or failing to split award across multiple suppliers to mitigate risk and conform with corporate acquisition policies, then the buyer could add capacity or limit constraints and run the model again.

While big models would take a few hours (or more), buyers could queue up multiple different (what-if) scenarios, leave the system running over night (or all weekend), and in less than a week arrive at the optimal award to the organization, much to the dismay of the suppliers and carriers hoping to maintain high margins. And often these buyers, after the first optimization on a category, would save 10%, 20%, and even 30% or more. An average buyer would declare victory and call it a day.

However, smart buyers soon realized that this level of return was not sustainable without continued effort. Just like subsequent auctions on a category failed to deliver a return, because the first auction squeezed all the fat out of the supplier margin, subsequent optimizations were not going to return additional savings if nothing changed, unless prices dropped considerably, which rarely happened.

These smart buyers started asking for multiple options from their suppliers and carriers. Specifically, alternate ship-from locations, packaging options, more bundle (discount) options, alternate delivery time-frames and windows, equipment types etc. to find new and additional opportunities for savings each time the category was sourced and the model was run.

In addition, these buyers also started to examine a few non-cost factors such as the lowest cost buy that was expected to meet the quality requirements (which was defined as a maximum expected defect rate), carbon production targets, or maximum delivery time on a rush order. And a few progressive buyers even considered supply chain re-design and looked at optimizing distribution center and warehouse locations. The smartest buyers are starting to push the envelope of what traditional TCO (Total Cost of Ownership) models can handle.

Have We Reached the Peak?

As a result of their efforts to be best-in-class with strategic sourcing decision optimization technology, many organizations are still seeing 10% to 30%+ savings the first time they source a new category with optimization, and an average annual return of 10%+ across events is still the norm when these buyers make it a point to consider more options in subsequent events. Considering this is typically a better return than any other Supply Management tool is delivering to the organization, one might be tempted to think that best-in-class organizations have reached the peak of what strategic sourcing decision optimization has to offer.

This viewpoint is not even close to the truth. First of all, there isn't a single organization out there that is maximizing the potential of strategic sourcing decision optimization even on the categories it is currently applying optimization to. Looking at quality requirements, carbon production targets, and maximum delivery times is a good start -- but what about more complex non-cost factors such as CSR (Corporate Sustainability Rating), co-marketing potential, or co-design? And what about more complex considerations such as geographic award splitting to mitigate risk, limiting new supplier introductions to minimize up-front switching costs, or supporting existing suppliers whilst simultaneously optimizing local distribution network storage vs. third party distribution network storage?

While a few organizations might be including a few of these options in their sourcing events, no organization is looking at all of these options simultaneously. But this isn't the peak. This is just a bigger and better version of what we have now. Despite the huge ROI that will be uncovered when the average organization goes whole hog into current optimization capabilities, applies all of the costing and constraint capability, and expands the number of categories that get the optimization treatment, the best is yet to come.

The Best Is Yet to Come

Strategic sourcing decision optimization may have reached a plateau in an average organization, but the peak is still a long ways off. Most organizations, including those that are best in class, have only begun to explore what optimization has to offer and, in reality, despite the value optimization has, and continues to deliver, the technology is still in its infancy.

Once organizations stop treating optimization as just another tool in the sourcing arsenal and start treating it as the next generation of analysis, which is what optimization really is, a whole new plateau, thousands of meters above the current plateau, will be reached.

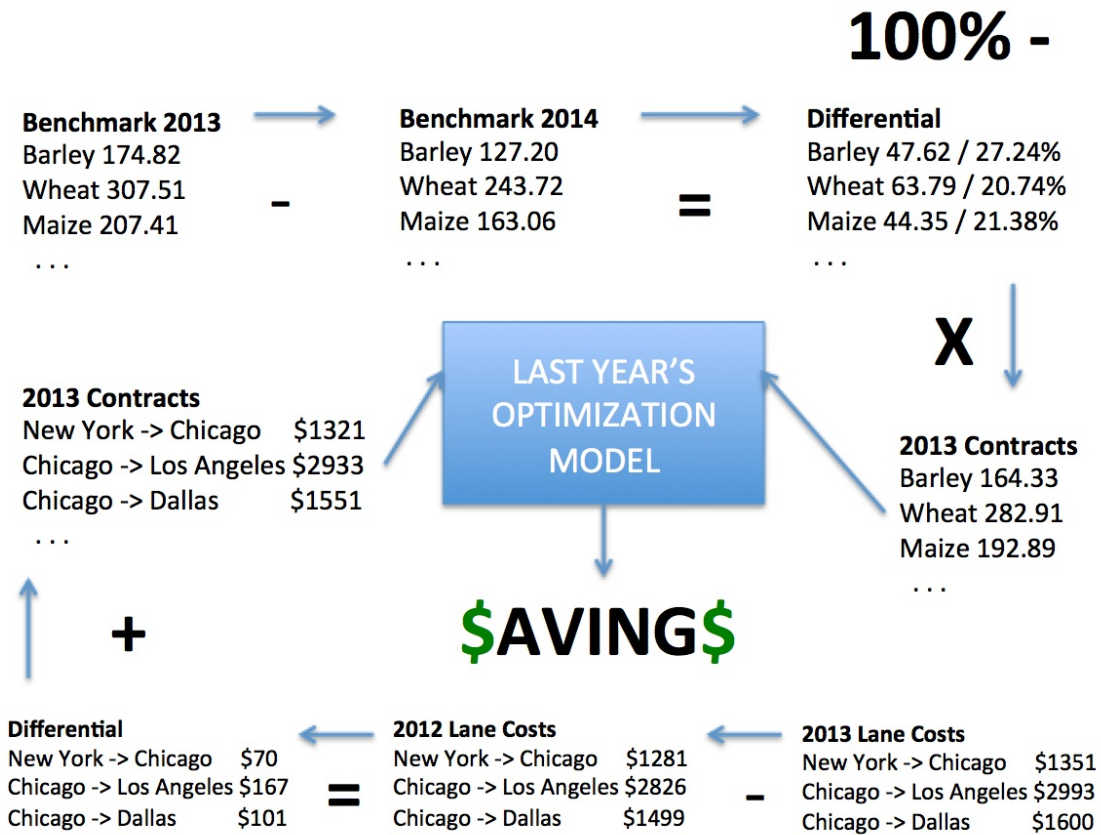
So how does an organization reach the next plateau?

After it insures it has a modern, best-in-class, flexible, powerful optimization solution from an innovative and supportive provider, an organization begins to apply the six simple techniques outlined in this section in a deliberate and methodical manner until its competency with, and results from, optimization takes it to a new level of organizational maturity, cost control, and value-generation.

Benchmarks Will Re-Define Re-Sourcing

Today, benchmarks are used to determine how well an organization has performed to date. While constant measurement is important, it doesn't really add value. Tomorrow, benchmarks will be used in conjunction with optimization to not only measure progress, but to help the analyst determine the most appropriate method for re-sourcing an existing category that will be the most likely method for delivering additional savings going forward.

Tomorrow, before a category is re-sourced, an optimization will be re-run on market-adjusted historical data to compute a **market baseline**, which is the proper definition of a benchmark, that will be used to determine a if there is a potential savings opportunity using strategic sourcing decision optimization. If there isn't, then a better approach will be defined for the category.



Specifically, the current market pricing for the commodities, as defined by the benchmark, will be compared to current organizational pricing and the differential will be used to adjust all of the historical prices for a baseline optimization. In addition, the distribution model will be updated as appropriate (with new lanes, new carriers, and new temporary storage options added) and current rate tables will be included. If this baseline optimization indicates a reasonable savings opportunity, then the category will be re-sourced using a multi-round negotiation process backed by strategic sourcing decision optimization.

If, on the other hand, this baseline indicates that costs are likely to rise (significantly), either because the core commodity costs have significantly increased and/or transportation and/or interim storage costs have increased, then the organization knows that it should change the sourcing approach and instead try for a contract extension at current, or only slightly increased, rates.

Alternatively, if costs have risen slightly but transportation and/or interim storage costs have stayed flat, then, unless there are new suppliers that could change the sourcing equation, the organization knows that it's best bet is probably to just put the category out to auction (to current and pre-qualified suppliers) and let the suppliers get as aggressive as possible for the organization's business.

Automated Optimization Will Identify New Sourcing Opportunities

Not only will benchmarks be used to determine the best methodology to re-source a category, but they will also be used to identify the best time to re-source a category and even the best categories to add to the strategic sourcing project list.

The use of benchmarks to determine whether or not a category should be (re)sourced with optimization will not be limited to categories previously sourced using (multi-round) strategic sourcing decision optimization or those categories where the sourcing team has selected decision optimization as the category strategy, but will be used on all categories selected for sourcing to determine the best approach to be applied to the category.

In other words, before any category is sourced, a model will be constructed using the known supply base, benchmark-adjusted historical pricing, delivery options, and current transportation rate tables to determine if there is a reasonable savings opportunity using strategic sourcing decision optimization, or if the category is better suited to reverse auction or contract extension with incumbents.

If there is no historical data, potential pricing data will be constructed using retail quotes and differentials against current benchmarks. If it is not feasible to construct such a model, the organization will simply assume average market price from each potential location, with minor adjustments for relative currency strength and projected currency trends. (There could still be a huge opportunity if transportation costs are highly variable across locations.) So the method is always applicable, even though confidence in the last case will be less than confidence in the first case.

Then the organization will apply this methodology to all categories that are not currently under management, due to manpower limitations, but which are large enough where even a 3% to 5% savings would be significant enough to warrant the manpower effort that would be required to put the category under management.

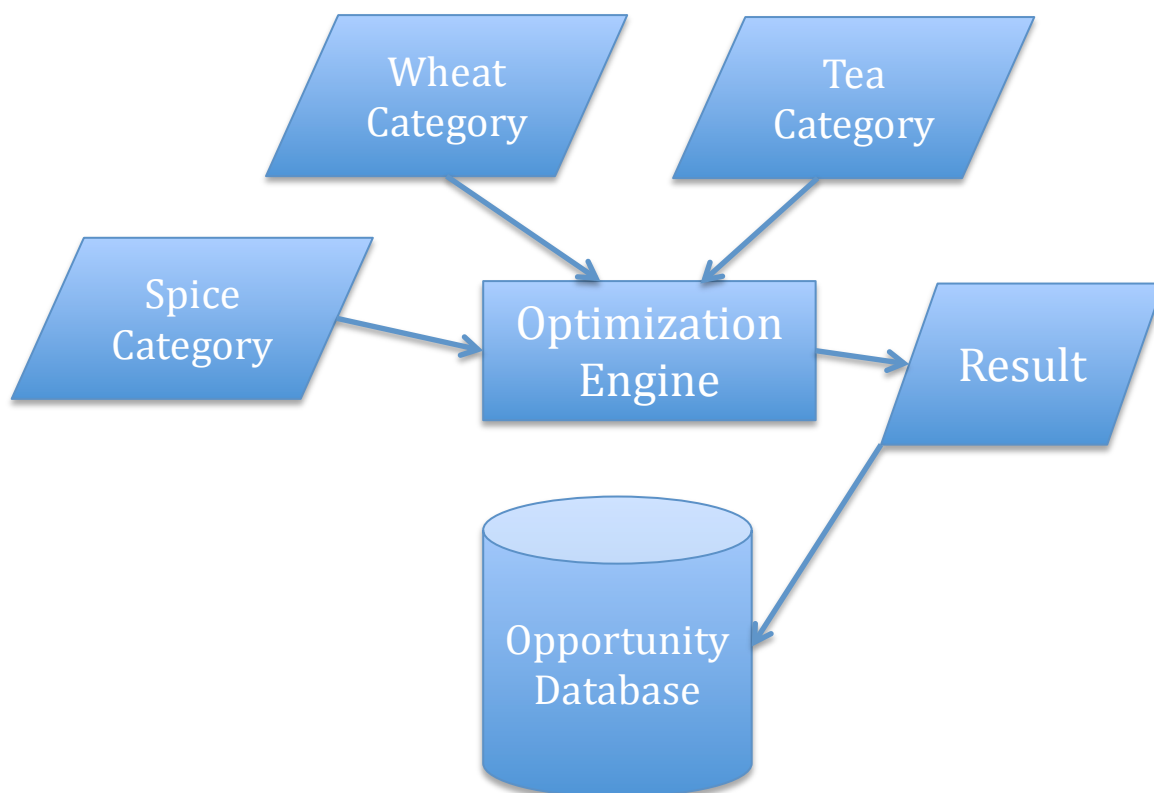
The organization will then automate the methodology and run it against all categories not currently under management on a monthly basis to detect if market conditions change enough to make it worthwhile to add the category to the sourcing pool. (If the organization does not expect to do better than it is currently doing by way of spot-buys or department-based acquisitions, then there is no point bringing the category under management if doing so would prevent the organization from pursuing more worthwhile savings or value generation opportunities.)

Finally, the organization will automate the analysis for all categories under management to automatically determine if market conditions change significantly such that it would be worthwhile for the organization to either negotiate extending the contract (if prices start to increase rapidly and the trend is expected to continue) or to renegotiate (or even break) the current contract (if prices drop considerably).

Optimization-Backed Multi-Category Events will Become the Norm

Today, best-in-class organizations source at the category level, and the leading consultancies all preach category management. The reasoning is that by sourcing at the category level, more opportunities for savings can be identified due to commonalities in supply base, overlaps in transportation requirements, and volume leverage opportunities. Furthermore, since there will be commonalities between the commodities being sourced, the overall complexity of the sourcing event will not exceed the capability of the team, and the tools they use, to manage the event and complete it in a reasonable time-frame.

But tomorrow, best-in-class organizations will source at the multi- or meta-category level where loosely related categories, that contain similar raw materials, are sourced from an overlapping supply base, or share special characteristics (such as cold storage or hazardous material transportation requirements). By “taking it up a notch”, the organization will find new opportunities that cannot be identified by single category optimization alone.

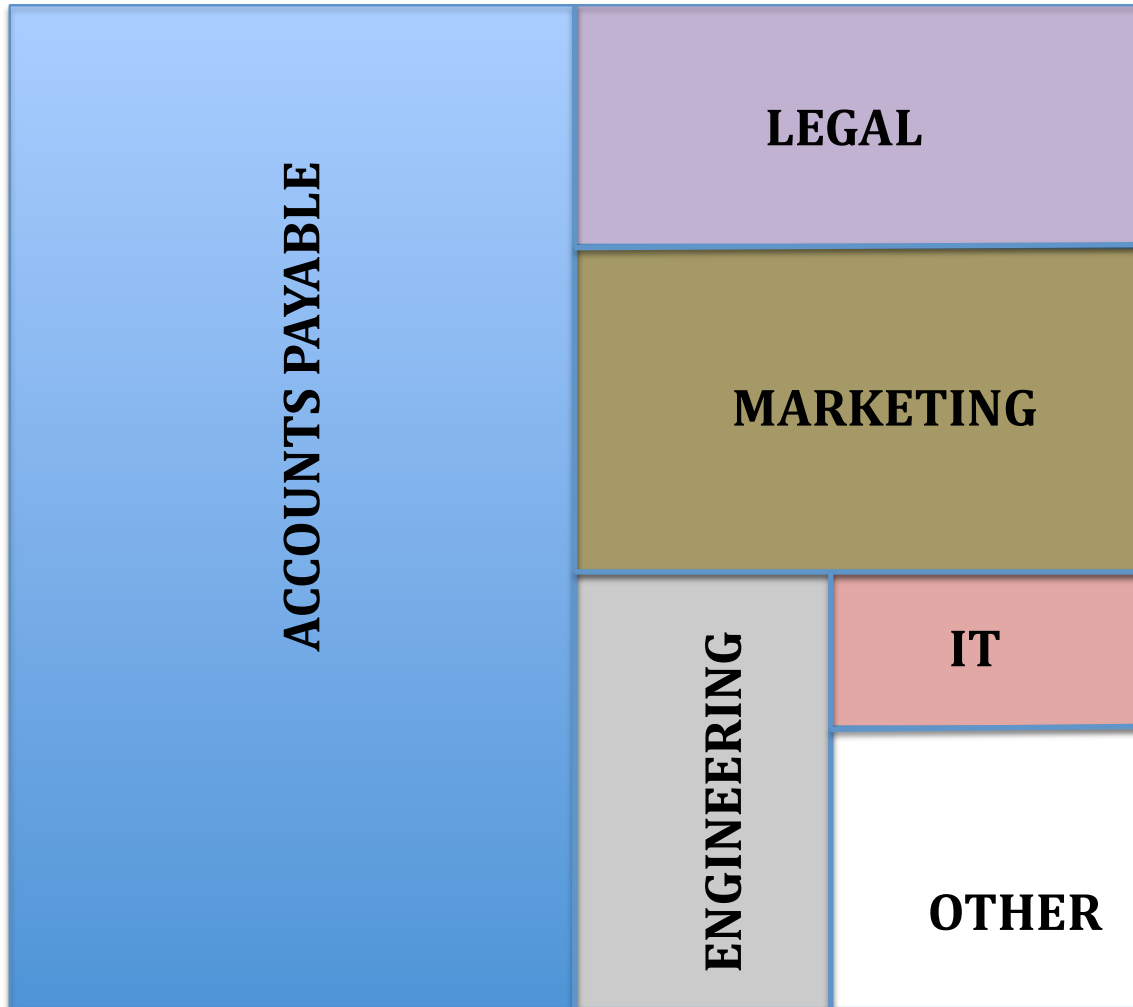


Stratified Optimization will Identify New Opportunities

Today, when an organization is doing its benchmarking, it's typically looking at the average price paid month-over-month, quarter-over-quarter, and year-over-year. This is fine if the organization is still buying the same product or service from the same suppliers and applying it to the same need. However, if the organization switched components or services, smart modelers don't compare year-over-year, they compare year-over-market and optimize for the new component or service.

However, the smart modelers won't stop there. Just like archaeologists realized that there was more to be learned by looking at deposits in layers, as each layer typically corresponds to a different time period, smart modelers will recognize that there are often discrepancies in spend by geography, department, or target market and will run local and global analysis to determine if there are any significant variations in spend that might indicate a potential savings opportunity by looking at the category in a different way.

For example, maybe the organization is centralizing its temporary labour contract through a national organization but perhaps 80% of temporary labour is for seasonal packaging and shipping support at its three distribution centers. In this situation, it might be better to not centrally manage the buy because a local temp agency in each region that contains a distribution center might be willing to provide temporary labour about 30% cheaper than a national temp agency. This would likely more than make up for any slight increase that might occur in other temporary labour categories due to reduced volume, and a quick analysis would reveal whether or not that is true.



Also, a departmental analysis of spend might reveal that certain departments are using more than their fair share of a certain product or service, and a further investigation by the sourcing team might uncover opportunities for cost control by working with the department to reduce demand.

For example, a departmental analysis might reveal (as depicted above) that, after installing an e-Invoicing solution, Accounts Payable (AP) is now using more paper, not less. An investigation might reveal that most suppliers are not using the e-Invoice capability of the system and instead of sending invoices in cXML, are simply sending their invoices as scanned PDFs that cannot be parsed by the system. As a result, Accounts Payable (AP) has to key in all of the invoice data before an invoice can be sent for approval and paid. Since the AP clerks only have one monitor, and they need the full screen to enter the data, they have to print out all of the invoices before they can re-enter them. Solution: upgrade all the AP clerks to a dual monitor system for a low one-time cost and watch paper spend plummet.

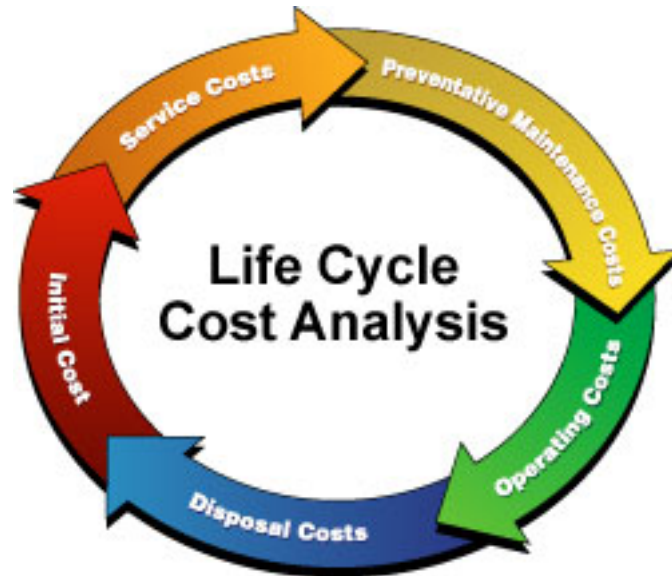
Optimization Will Allow True Life-Cycle Sourcing

Even though most optimization platforms claim true TCO (Total Cost of Ownership) support and most top organizations claim to be doing TCO modeling in their sourcing events, most organizations are only modeling the total costs associated with sourcing/acquisition and production, in other words, T-CAP. As a result, they are capping their return from optimization because they are not looking at future costs associated with distribution, sale, and, most importantly return.

If a sourcing organization truly wants to minimize costs, they need to look at both inbound and outbound transportation costs and whether there are any savings opportunities with selecting certain carriers for inbound goods. If a carrier gets a lot of inbound business, can that be leverage for outbound business and vice versa? In addition, every few years Supply Management should analyze its distribution network and determine if a different network configuration would allow for lower overall inbound costs from suppliers and outbound costs to customers (distribution center)s.

In addition, an organization also has to take warranty, return, and reclamation costs into account. If an organization is expecting an 8% defect and return rate, how much will it cost to replace the item and return the defected item to the supplier for credit? This cost needs to be factored into the award as well. It won't be the same for each supplier. Some suppliers will require (expedited) return within 30 days, other suppliers will require more paperwork, and another group of suppliers won't credit the organization for ninety (90) days, which means the organization will be losing potential interest or revenue generating ability on its cash while the cash is locked up in the supplier's bank account.

And then there are environmental regulations that might be forcing the organization to take back its products that contain (potentially) hazardous materials or restricted substances, and safely recycle or dispose of those products. This is also a cost that has to be considered, which may not be the same for all suppliers if the product has to be sent back to the supplier for reclamation or disposal.



Optimization Will Take Cost Out of the Supply Chain

An organization's view of the supply chain is a limited view from a fixed point in traditional 4-dimensional space. Such a view is not the complete picture, especially since an organization's view is limited beyond its first tier supplier, which blocks its view of what lies beyond the same way a mountain blocks your view of the horizon, and its direct customer, for the same reason.

This would be fine if the organization was the only source of inefficiency and wasted spend in the supply chain, or maybe even if every organization in the supply chain was also (properly) applying strategic sourcing decision optimization to find and remove inefficiency, but this is not reality. (Furthermore, even if every organization in the supply chain applied optimization to its sourcing activities, there would still be inefficiency.)

A progressive sourcing organization will not only do multi-category optimizations, but also analyze across "should-cost" models for (custom) manufactured products to identify situations where the supplier's production cost could be reduced if the organization bought a raw material, such as steel, on behalf of its supplier.

It will also optimize should-cost models for high-spend categories and identify opportunities where, accounting for a reasonable margin, the current/incumbent supplier's lowest bid should be significantly lower than it actually is and then, using its should-cost modeling and optimization capability, work with that supplier to determine the source of the cost overrun and, if necessary, even work with the supplier to conduct an optimization-based sourcing event to bring down key cost factors. This is how leading organizations will use optimization, in conjunction with benchmarking and should cost models, to take cost out of their supply chain.

Optimization is the Plan

Today, sourcing analysts use spend and market analysis to analyze a category and then decide if they are going to approach the category using traditional negotiation, a real-time reverse auction, or multi-round negotiation with strategic sourcing decision optimization.

However, as the previous section should have made clear, this is the wrong way to do it. Optimization should be used in *every* category analysis to determine what the best approach for sourcing the category is. Optimization is not the strategy, it is the plan, and the planning tool. Leading organizations will use optimization to determine the best way to approach every category and conduct a successful cost savings or value generation sourcing event every time.

Summary

In the beginning, back in 1935	He said let there be math There was math
Man didn't know about linear solvers And all that jive	Let there be tableau There was tableau
The vendor made the bids The buyer had no clue	Let there be pivots There were pivots
No one knew what they was gonna do But George Dantzig had the news	Let there be simplex There was simplex Let there be ... Optimization!

Strategic Sourcing Decision Optimization has not only come a long way over the past fourteen years, but it has brought Supply Management a long way with it.

Before optimization, Supply Management's only option for significant cost reduction was a reverse e-auction where suppliers were forced to compete against each other in real-time and price reductions were required for a new vendor to win the bid. This worked well in the late 90s when supply exceeded demand, there was lots of fat in supplier margins, and foreign companies who wanted a bigger piece of the Global 3000 budget were willing to get aggressive to win the business. But once demand caught up to supply, or the tables turned and demand exceeded supply, the fat was taken out of the margin, foreign companies had their fill of loss-leader business, and, more importantly, raw material costs started rising, reverse e-auctions didn't work so well. Not only did savings essentially disappear, with 3% being a successful auction, but in many categories, costs increased!

Strategic Sourcing Decision Optimization (SSDO) changed everything. Not only did it provide organizations with a new advanced technology platform for identifying savings, but it provided companies with a way to identify savings that didn't involve squeezing supplier margins to the point where it was unprofitable for the supplier to win the organization's business. It was a huge win for the early adopters because not only did it identify significant cost savings, as early adopters often saw 20% to 30%+ savings on a category the first time it was sourced using optimization, but it didn't put the supplier's business, and the organization's primary source of supply, in jeopardy.

Furthermore, unlike reverse e-Auctions, companies that effectively used strategic sourcing decision optimization platforms saw additional savings the next time they sourced the category as the platform allowed them to consider more sourcing options, more lanes, alternate production options, cost benefits from value-adds, and so on -- options that could not be considered otherwise. On average, these organizations are still seeing a double digit savings (of 10% or more) year-over-year with the repeated application of SSDO to appropriate categories.

These leading organizations are doing great, and may not see the need to do better, but the reality is that even the leading organizations, many of whom are still using first generation strategic sourcing decision optimization platforms, have only implemented the basics of strategic sourcing decision optimization. Modern platforms enable more extensive events, more analysis, and more ways of looking at optimization as not just a sourcing tool, but a sourcing planning tool -- which really changes the nature of the game.

Not only will next generation sourcing technology allow a leading organization to continue to identify savings in categories where costs are continually rising for the competition, but it will allow the organization to identify new opportunities for the application of optimization, including those applications it never thought possible.

An organization won't be limited to tackling one hundred million plus categories to find ten million worth of cost reductions -- by using optimization to identify the right categories, the organization will be able to identify a set of categories in the million to tens of million dollar range that can collectively contribute at least ten million in savings when properly sourced. Taking optimization to the next level will effectively provide leading organizations with a new dawn.

About Trade Extensions:

Trade Extensions was founded in 2000 by a team of recognized leaders in the field of advanced optimization algorithms with leading competence in algorithm design, microeconomics and advanced electronic markets. In early 2001, the company conducted the world's first online combinatorial auction with direct feedback to bidders. In 2007, the company merged with Freight Traders, a UK-based logistics sourcing solution provider and 2008 saw Trade Extensions established its first U.S. office in Houston. Trade Extensions now has offices across Europe and the U.S. and its sourcing platform is used by leading companies as diverse as P&G, Cargill, Coca-Cola, Dow Chemicals, and Kimberly-Clark.