

Why Mastering Complexity in the Value Chain Matters to Procurement (Part 2)

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In [part one of this series](#), I introduced the topic of complexity and its relevance to current market conditions, to supply chains and to procurement. But, the topic of complexity itself is, well, complex! So I'm going to try to simplify it while also broadening it and making it a key weapon in the procurement and supply chain arsenal.

The Topic of Complexity is Not New

Complexity theory and chaos theory are two huge bodies of knowledge that were heavily developed and discussed in the late 1980's and 1990's. I won't get into those topics here, even though I severely geeked out on those topics back in college. If you want to delve into those, you should read James Gleick's book [Chaos](#) and Mitchell Waldrop's book [Complexity](#). But for procurement practitioners, you can go back further to 1983 and how complexity is applied to supply markets. Look no further than the x-axis of the [esteemed Kraljic matrix](#). Complexity in this context is used by most procurement practitioners to model supply market category complexity in a way that can be used to strategize how to best engage suppliers (e.g., in negotiations). Keep in mind that Kraljic's context for complexity is focused on "negotiation complexity" in a Porter-esque five forces sort of way.

Yet complexity is much more, and in fairness, on the Kraljic matrix, the description of complexity includes "the pace of technological advance." Not only is technology massively advancing in the physical sciences, but the recent information technology advances related to mobile, cloud, social, IoT and cognitive computing are [digitally disrupting value chains](#) and supply markets that are getting ripped apart and recombined in new and unpredictable ways. New IT tools and techniques are needed to manage this new landscape, namely the new classes of predictive analytics that help find nuggets of insights from an overwhelming set of big data sources. This is why [procurement needs to get savvy on this topic](#) and why we're dedicating so much attention to it in our upcoming [March conference on Procurement Technology](#).

[Supply market categories are strongly multivariate](#) and complex in their own right, so it's important to formally manage this complexity using new sets of techniques and tools in the sourcing process, as my colleague Peter Smith addressed well in his [paper on complex sourcing](#). Market-informed sourcing techniques that use combinatorial optimization software basically allow you to expressively model requirements, capabilities, constraints, scenarios and optimal allocation of businesses. The techniques enabled by the technology are actually [akin to corporate strategy](#) and strategy deployment (also known as "hoshin planning"). In essence, the technology enables a more powerful set of techniques to extract supply market value not available before — it's not just automating an existing manual process.

Using Complexity Management as a Mega Capability

So, complexity reduction is about two things:

- reducing unneeded complexity, and
- better coping with existing complexity

that can't be eliminated, and that you don't want to eliminate because it provides a strategic advantage. The beauty is that not only can procurement organizations generate many opportunities by reducing complexity in the source-to-pay process ([even in P2P](#)) and within the inbound supply chain (e.g., reducing unneeded supply base complexity through supplier consolidation, broader category management, and supply network optimization), but it also dovetails with existing continuous improvement efforts (Lean and Six Sigma) and "discontinuous improvement" efforts such as mega corporate simplification programmes.

Complexity management is so powerful because it can unite a broad set of methodologies, techniques and tools that are understandable and relevant to procurement's stakeholders:

- Supply network redesign for supply chain
- Value engineering and product portfolio simplification in product development (and value engineering to reduce purchase part counts)
- Service-oriented cloud architectures in IT to help reduce technology complexity
- Master data management to simplify, harmonize and manage data
- Using Lean and Six Sigma for processes and also for data

Keep in mind that many companies have pursued these initiatives individually, but using complexity management as an umbrella strategy has been pursued at many organizations such as **Toyota**, [IBM](#), **Motorola**, **Campbell's Soup** and others. It's also been an active area for consulting organizations to engage their clients. For example, [Deloitte](#) really took the leadership position in complexity reduction in manufacturing with its "[complexity masters](#)" research, but [KPMG](#) has also done [great work](#), as have [Bain](#), [GEP](#) and others. And if you want to dive into academic research, I highly recommend this [piece of excellent research](#) from USC that takes an inventory of previous supply chain complexity frameworks.

In the next installment of this series, we'll introduce the Seven V's framework, highlight some case studies and explore the elements that are relevant for procurement and supply chain organizations.