Foreword

What makes a supply chain great? As supply chains are made of people, a frequent answer is *great leadership* is what it takes. Indeed...but *great* is vague. More specifically, what sort of qualities and competencies should a company seek to foster among its supply chain management? The 20th century answer to this question has primarily been reliable, diligent, energetic if not charismatic leaders, capable of organizing the work of thousands of workers, and literally creating the *mass production* supply chains as we know them today.

Yet, with the advent of the barcode reader, supply chains had, by the end of the 20th century, already outgrown the *direct* capabilities of the human mind, even the most talented ones. There are too many SKUs, too many suppliers, too many clients, too many channels to expect management to sort it all out through sheer willpower. Instead of *directly* controlling fine-grained supply chain decisions, companies transitioned toward *indirect* management through software.

In this respect, supply chain management has been lagging behind. Factories have been heavily automated for over two decades—a few verticals such as textiles aside. Warehouses are getting there and will be almost exclusively automated by the end of the 2020s. Transportation still faces the *last mile* problem that resists automation, but within one decade—two at most—autonomous vehicles will be commonplace and deliver the last major productivity gains to be ever observed in supply chains. Beyond this point, blue collar jobs will have almost completely disappeared from supply chains.

Yet, software-driven supply chain management takes a fairly distinctive skill set compared to people-driven supply chain management. Being great at software takes a *hacker* mindset that emphasizes tinkering with programs or machines, experimenting for fun and profit, and treating reverse engineering as much as a learning opportunity as a way to hack your way into a better system. This hacker mindset wasn't part of the recipe for 20th century leadership, and yet, I firmly believe it will be the cornerstone of 21st century leadership.

In this book *Inventory Optimization: Models and Simulations*, Nicolas Vandeput hacks his way through the maze of quantitative supply chain optimizations. This book illustrates how the quantitative optimization of 21st century supply chains should be crafted and executed. This book is based on many years of experience, earned the hard way from the supply chain trenches of large companies.

With usually no more than 10 lines of Python, Nicolas Vandeput revisits classic models and turns mathematical models into actionable pieces of software. Doing so, Nicolas demystifies the discourse of (most?) large software vendors in supply chain who—under the guise of Big Data/AI/Demand Sensing (pick your buzzword)—end up delivering *less* than what Nicolas achieves with highly accessible tools, be it Excel or Python.

Also, after revising the classics, the last five chapters, starting from “Beyond Normality,” venture into hard problems that do not have nice, closed-form, analytical solutions. Yet, once again, the book delivers the hands-on demonstration that even tough problems can be brute-forced to some extent with histograms, kernels or Monte Carlo algorithms.

The optimization of the 21st century supply chain will be driven by hackers. Hackers share insights, but more importantly, they share *code* as well. Nicolas Vandeput is at the forefront of a new and better way of doing supply chains, and thanks to a richly illustrated book, where every single situation gets its own illustrating code snippet, *so could you*.

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