PART I

Introduction to Supply Chain Management

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CHAPTER 1

If Supply Chain Is the Answer, Then What's the Question?

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Flashpoints

A supply chain is the sequence of events that cover a product's entire life cycle, from conception to consumption.

A one-size-fits-all supply chain strategy is doomed to failure.

Although the modern concept of supply chain management dates back to the early 1980s, very few companies have fully embraced it.

Building a best-in-class supply chain requires money, time, talent, energy, focus, commitment and guts.

You Knew This Job Was Dangerous When You Took It

Imagine, if you will, a typical day in the life of a supply chain professional. Your boss comes into your office with one of those looks you've come to dread—furrowed brow, deep-set eyes, concerned scowl. He looks you straight in the eye and asks you why it costs so much to transport your company's products to your customers. You can tell by the expression on his face that he doesn't want to hear about rising fuel costs or industry consolidation. It's *your* job to worry about that stuff, not his. And right now, even though your budget projections say you'll have to spend at least 5 percent more on transportation this year than you did last year, your boss tells you in no uncertain terms that he expects you to keep the increase down to 2 percent or less. Preferably less.

At the water cooler, your director of sales gives you a sheepish smile and asks if you can arrange for an extra 1,000 widgets to be made and shipped to

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a big customer by the end of the week. Actually, she doesn't really ask you so much as *tell* you, since she's already promised the customer that it will happen. She leaves before you get the chance to ask if she's charging the customer double the normal price since it'll cost you at least twice normal rates to source the parts used to make the widgets from your offshore supplier, plus the cost of expedited delivery. On top of that, production will have to schedule an extra shift to get that many widgets made that quickly.

Later in the morning, while you're patting yourself on the back because you managed to find a domestic source for most of the widget parts, your boss asks you to shepherd your company's radio frequency identification (RFID) initiative. The Department of Defense (DoD), another big customer, wants your company to put RFID tags on every case of widgets that you ship to them. It's part of the DoD's efforts to keep better track of its inventory. That's great for the military, but your boss wants you to figure out how RFID is going to help your company, particularly since industry estimates say you could incur start-up costs of more than $1 million. Your boss waves off the list of questions that immediately come to your mind; he wants you to answer those questions yourself, provide him with regular updates on your progress, and map out an implementation plan that results in a decent return on investment within a year.

For all his many faults, though, your boss is a fair man, and recognizing the extra burdens he's been laying on you, he invites you to lunch. Before your salad arrives, he's already launched into a harangue about outsourcing. Your competitors have been getting to market faster and are spending less money to do it, and he's convinced it's because they've contracted their distribution to third-party logistics providers (3PLs). So when you get back to the office, he wants you to figure out which 3PL can do it better, faster, and cheaper for you. Your customer service levels, needless to say, cannot change in the slightest, unless of course they actually improve.

Oh, and one more thing, your boss adds as you get up to leave the restaurant: He wants you to schedule another trip to China (your seventh trip there in three years). It's time, he says, to get serious about this globalization stuff, and you can start by lining up another low-cost supplier for your widget parts.

Most of your afternoon is spent trying to mend some fences down in the information technology department. Your chief information officer has made it clear that absolutely nobody is going home today until somebody can figure out why the supply chain planning system still isn't fully integrated with the inventory management system—and why manufacturing keeps making 12-inch widgets when the sales plan calls for 18-inch versions. Toward the end of the afternoon, your plant manager asks for "a little bit of help" calculating what the plant's carbon footprint is. You get the unmistakable feeling that he wouldn't mind one bit if you figured it out for him.

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As you finally shut down your computer and get ready to call it a day, your head of human resources pops her head in your doorway and tells you she hasn't had a bit of luck yet finding a global trade expert, so it looks like you'll have to keep filling in for a while longer. Hearing the tail end of that conversation, your boss walks with you out to the parking lot and reminds you he still needs to see your contingency plan in the event of a work slowdown at a major West Coast port. Oh, and a big storm is developing in the South China Sea, and one of your key supplier's plants is right in the storm's path. Fortunately, you'll be able to monitor the situation from your home throughout the evening, thanks to modern technology and all the personal productivity gadgets your company has purchased for you.

At the end of the day, after you've kissed your spouse goodnight and laid your head on your pillow, you drift off to sleep secure in the knowledge that the distance between you and your supply chain is no further than the BlackBerry recharging on your nightstand.

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The Big Picture

Admittedly, the preceding example represents a rather extreme and time-compressed scenario, but on any given day, a supply chain manager has to deal with numerous situations quite similar to those just described, with the expectation that costs will be minimized, disruptions will be avoided, and the profitability of the company will be enhanced. No pressure, right?

Maybe we're getting ahead of ourselves, though, so let's start at the beginning: What exactly is a supply chain? There are plenty of definitions for the term, and we'll look at a couple of them, but this question gets asked so often because the answer tends to change depending on who's doing the telling. It's like that old fable about the blind men who stumble on an elephant and try to tell each other what the elephant is like: The man holding the elephant's leg thinks the animal looks like a tree; the man holding the tail thinks an elephant resembles a rope; a third man who grabbed a tusk thinks the whole animal must look like a spear. Each of their answers is partly right, but anybody who has actually seen an elephant smiles at the story because they know these blind men are missing the big picture.

The funny thing is, those kinds of faulty assumptions are made all the time about supply chains. Since computer maker Dell's supply chain is based on a make-to-order model, for instance, it has been suggested that Dell's direct model is the best model for *all* high-tech companies or, for that matter, for *any company in any industry*. However, while rival computer maker Hewlett-Packard's sourcing processes might look a lot like Dell's, its transportation networks will be completely different from beef producer ConAgra's, which relies on refrigerated vehicles. So, the idea that "one

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supply chain strategy fits all" is as wrong-headed as thinking an elephant looks like a tree.

A *supply chain*, boiled down to its basic elements, is the sequence of events and processes that take a product from dirt to dirt, in some cases literally. It encompasses a series of activities that people have engaged in since the dawn of commerce. Consider the supply chain General Mills manages for every box of cornflakes it sells: A farmer plants a certain number of corn seeds, cultivates and harvests a crop, sells the corn to a processing facility, where it is baked into cornflakes, then is packaged, warehoused to a distributor, transported to a retail store, put on a store shelf, sold to a consumer, and ultimately eaten. If the cornflakes are not sold by the expiration date on the box, then they are removed from the retailer's shelf and disposed of.

A supply chain, in other words, extends from the original supplier or source (the farmer and the seed) to the ultimate customer (the consumer who eats the cornflakes). So whether you're talking about an Intel semiconductor that begins its life as a grain of sand or a Ford Explorer that ends its life in a junkyard where its remaining usable components (tires, seat belts, bumpers) are sold as parts, everything that happens in between those dirt-to-dirt milestones encompasses some aspect of the supply chain.

The Supply Chain Council, an organization that develops industry benchmarks and metrics, came up with a way to summarize the concept of supply chain management in just five words: *plan*, *source*, *make*, *deliver*, and *return*. While it's difficult to find a consensus in any field, let alone a field that intersects with so many disparate disciplines, that five-word definition has been accepted as the basic description of what a supply chain looks like and what its core functions are. (The Supply Chain Operations Reference, or SCOR, model is discussed in Chapter 3.)

For those who like a little sizzle with their steak, another industry group, the Council of Supply Chain Management Professionals (CSCMP), is a bit more descriptive with its definition: "Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities." That includes coordinating and collaborating with channel partners, including suppliers, intermediaries, third parties, and customers. In short: "Supply chain management integrates supply and demand management within and across companies."[1]

The Supply Chain's Back Story

As noted, the concept of working with suppliers and customers is as old as commerce itself, but the modern idea of a "supply chain" is fairly recent,

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probably dating back no farther than the late 1950s to the pioneering research conducted by Jay Forrester and his colleagues at the Massachusetts Institute of Technology. A half century ago, Forrester began studying supply pipelines and channel interrelationships between suppliers and customers, and he identified a phenomenon that later came to be known as the *bullwhip effect*.

Forrester noticed that inventories in a company's pipeline (i.e., supply chain) tend to fluctuate the further they are from the ultimate end user.[2] The idea of the bullwhip effect remained largely a curiosity until the 1990s, when computers were fast enough, powerful enough, and affordable enough that researchers could not only gain an understanding of the bullwhip effect, but also design software programs that could circumvent it. Supply chain management as a discipline basically evolved out of Forrester's quest to understand and ultimately control these increases in demand fluctuations. Although he didn't use the exact words "supply chain" to describe his findings, "Forrester and his group should really get the credit for supply chain management," asserts Edward Marien, longtime director of supply chain management programs at the University of Wisconsin.[3]

At some point in the early 1980s, the concepts of transportation, distribution, and materials management began to merge into a single, all-encompassing term: *supply chain management*. The term apparently first appeared in print in 1982, and is attributed to Keith Oliver, a consultant with Booz Allen. In any event, in 1985, Harvard professor Michael Porter's influential book, *Competitive Advantage*, illustrated how a company could become more profitable by strategically analyzing the five primary processes on which its supply chain framework is built:[4]

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1. *Inbound logistics*. These are the activities associated with receiving, storing, and disseminating inputs to the product (material handling, warehousing, inventory control, transportation scheduling, and returns to suppliers).
2. *Operations*. This refers to the activities associated with transforming inputs into the final product form (machining, packaging, assembly, equipment maintenance, testing, printing, and facility operations).
3. *Outbound logistics*. These are the activities associated with collecting, storing, and physically distributing the product to buyers (finished goods warehousing, material handling, freight delivery, order processing, and scheduling).
4. *Sales and marketing*. Within a supply chain context, these are the activities that induce buyers to purchase a product and enable them to buy it (advertising, promotions, sales force, quoting, channel selection, channel relations, and pricing).

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5. *Service*. This refers to the activities associated with providing service to enhance or maintain the value of the product (installation, repair, training, parts supply, and product adjustment).[5]

Like Forrester before him, Porter saw that companies could significantly improve their operations by focusing on interrelationships among business units. These interrelationships, he wrote, are "tangible opportunities to reduce costs or enhance differentiation in virtually any activity in the value chain. Moreover, the pursuit of interrelationships by some competitors is compelling others to follow suit or risk losing their competitive position." As a result, according to Porter, it is critically important for companies to focus on horizontal strategy—a coordinated set of goals and policies across distinct but interrelated business units. This horizontal strategy, which is a succinct way of describing supply chain management, represents the essence of corporate strategy.[6]

Although their work was separated by more than two decades, both Forrester and Porter saw that a vertical strategy—the idea of compartmentalizing every department and group into unconnected silos—was counterproductive to a company's long-term growth and health. Curiously, two decades after Porter's work, one of the popular buzzwords of the day—unsiloing—refers to the concept of managers cooperating across departments and functions, sharing resources, and cross-selling products to promote the entire company's bottom line.[7]

The terms may change throughout the years, but the underlying goal of supply chain management has remained constant:

- Articulate exactly what a company's supply chain looks like and what it encompasses.
- Identify specific bottlenecks that are slowing down the movement of information, goods, and services.
- Put the right processes in place to get the right products delivered to the right place on time.
- Empower the right people so they can accomplish all of the above.

Roadblocks on the Supply Chain Path

Although the concept of supply chain management entered the public consciousness nearly 30 years ago, to date only a very small percentage of companies have fully embraced the idea. Even though many of the best-known manufacturing and retail companies in the world are as celebrated for their supply chains as they are for their brands, relatively few companies even attempt full-scale supply chain projects, and of those that do, many

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are stymied by various roadblocks that make them question whether the end result will be worth the aggravation.

Consulting firm Accenture teamed up with Stanford University and global business school INSEAD to try to figure out why that should be.[8] Of the companies they studied, it turns out that more than half encountered unexpected problems in the course of their supply chain transformations. Exacerbating the situation is the fact that these problems aren't easily solved:

- *Technology implementations didn't work as promised*. The supply chain movement faced a moment of crisis when the Internet bubble burst, taking many supply chain technology vendors (and even more vaporware companies) with it. Companies that should have known better assumed that establishing a Web site was a ticket to instant riches, and they embraced the Internet with a giddy "gold rush" fervor. They spent millions on ill-advised end-to-end projects that had no timeline for deliverable payback, and they got badly burned in the process. To this day, many companies still remain extremely cautious about investing in any kind of supply chain solution.
- *Projects cost too much and never came close to meeting service targets*. This problem predates the supply chain. The list of unfinished and underimplemented enterprise resource planning projects is a lengthy one, and unfortunately there are plenty of similarly out-of-control supply chain projects to add to that list. Many of these enterprise-wide initiatives end up being a bottomless money pit of costs with no end in sight and no discernible benefits.
- *Supply chain projects were inconsistent with a company's current business strategy*. The unfortunate reality is that many companies don't have a well-defined business strategy. Trying to plug a supply chain initiative into an uncertain and continually shifting corporate plan can wear out even the most patient project managers.
- *It was too difficult to manage change internally and externally*. For a supply chain project to succeed, employees first need to be convinced that sharing product and transactional data between their own divisions is a good thing. Too often, companies will fail in their attempts at collaborating with key supply chain partners because their own internal groups don't cooperate with each other. You have to be able to trust your own people before you can hope to collaborate with other companies.

The Accenture study, incidentally, looked at companies that ultimately found a way to successfully launch and complete their supply chain initiatives. You can well imagine that at companies that have had far worse luck with their projects, many managers close and lock their doors behind

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them every time they see a supply chain project leader walking toward their offices.

Separating the Good from the Best

There's no getting around it: Supply chain management is just plain difficult. No single company has all the answers, and what's more, most companies ask virtually the same questions. So why are some companies celebrated for their supply chain successes, while other companies seem to be stuck in a rut? What distinguishes a best-in-class supply chain from every other supply chain?

As this book will illustrate, every top-performing company—no matter what industry it competes in—has aggressively attacked its inventory problems, committed resources to improving its customer service levels, and partnered with its key suppliers to take control of its supply chain. Every single one of them.

Top-performing supply chains, quite frankly, do things a little differently than everyone else. According to Debra Hofman, an analyst with AMR Research Inc., best-in-class companies share these three traits:

1. *They aim for balance*. These companies may not be the very best in every category, but they are consistently good enough in all areas that they add up to be best-in-class.
2. *They increase demand visibility*. Having a high level of forecast accuracy is the key to reaching perfect order fulfillment, which is the holy grail of customer service.
3. *They isolate high costs*. The best companies know where they hold their costs and why, so that's where they focus their best practices and technology investments.[9]

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Karen Butner, global supply chain management leader for the IBM Institute for Business Value, boils it all down to one common factor: "Top supply chains all have the ability to respond quickly to shifts in demand with innovative products and services."[10]

When it comes to best practices, supply chain success requires commitment at the highest corporate levels. It should surely come as no surprise that the chief executive officer (CEO) of the biggest company in the world (Mike Duke of Wal-Mart) used to manage the company's logistics department, which is where the retail giant's strategic edge begins. Booz Allen, the consulting firm that first popularized the term *supply chain management*, reports that companies with CEO-level support for their supply chain projects have nearly twice the annual savings in customer service costs as

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companies where the responsibility is lower in the organization. In a survey of senior executives, Booz Allen concludes, "Without guidance and oversight from the CEO and the company's full leadership team, the supply chain's performance often does not live up to expectations."[11]

Best practices don't just happen by throwing a lot of money at your supply chain problems. Improvements come through strategies that identify and track key supply chain processes early and often. As J. Paul Dittmann, director of the University of Tennessee's Office of Corporate Partnership, has observed, very few companies actually have a documented supply chain strategy.[12] "Such a strategy," he suggests, "starts with assessing the future needs of their customers. The strategy development process then determines the new supply chain capabilities the company will need in the future to meet its customers' needs. Unfortunately, most supply chain organizations are so consumed with the daily battles of cutting cost, managing inventory, and delivering good customer service that they don't plan properly for the future, sometimes with disastrous results." Indeed, whenever companies experience the first hint of trouble, whether it's the onset of an economic recession or a new competitor that seemingly sprang up overnight, the supply chain strategy is shelved, where it often sits collecting dust for many years.

In short, building and maintaining an end-to-end supply chain organization takes money, but it also takes time, talent, energy, focus, commitment from senior management, and a lot of guts to pull it off successfully. However, those are the qualities that the best-run companies in the world share, and it's why they're on top. As Dittmann says, "Supply chain is the frontier of competition." In the next chapter, we'll look at specific examples of how some well-known companies in a number of different industries are managing their best-in-class supply chains.

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