three parts. Part I briefly introduces supply chain management with examples of best-in-class supply chains in various industries and proven methods for measuring the performance of a supply chain. Part II presents the traditional core processes of supply chain management and discusses the best practices being followed by specific trend-setting companies within the global marketplace. Finally, Part III reveals the strategies, solutions, and technologies used by leading companies to design their extended enterprises, including up-to-the minute tips on going green and lean in your supply chain.

Get your company on the supply chain “best practices” track and achieve supply chain excellence with the world-class guidance found in Supply Chain Management Best Practices, Second Edition.

DAVID BLANCHARD is an award-winning journalist and the Editorial Director and Associate Publisher of Penton Media’s Supply Chain Group. He has served as editor-in-chief of several Penton magazines, including IndustryWeek, the leading publication for manufacturing professionals, Logistics Today, and Supply Chain Technology News. He has also launched and edited numerous print and online publications covering the supply chain, transportation, manufacturing, and computer industries. He is a frequent speaker at major supply chain industry events. He lives in a suburb of Cleveland, Ohio.
Supply Chain Management
Best Practices
Supply Chain Management
Best Practices

Second Edition

DAVID BLANCHARD

WILEY
John Wiley & Sons, Inc.
To Nancy, Julia, and Grace
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Preface to the
Second Edition

As noted in the first edition, when you give a book a title like *Supply Chain Management Best Practices*, there’s not much mystery in what it’s going to be about. Throughout its 18 chapters, this book will identify some of the best supply chains in the world, describe in detail what it means to have a “best-in-class” supply chain, and offer suggestions—in the form of best practices—on how to build a world-class supply chain.

This book is largely told through the experiences of supply chain practitioners and experts. The companies and the people referred to in this book are real, as are their accomplishments (and, in some cases, their failures). What sets this book apart from other supply chain books is that I have taken a journalist’s approach to the subject rather than an academic’s or a consultant’s. As the editorial director of Penton Media’s supply chain group of publications, I’ve had access to supply chain professionals at companies of all sizes, in dozens of different industries. So in writing this book, I have set out to tell the story of supply chain management through the eyes of the people who know it best.

In the United States alone, companies spend more than $1 trillion every year on transportation, warehousing, distribution, and associated inventory management. The responsibility for managing that spending falls squarely on the shoulders of supply chain professionals. Their roles may differ from company to company, but their goals are generally the same: develop and position their companies’ supply chains so that they can compete and win in today’s global marketplace. Many of these professionals work for companies that consider supply chain management and its many subdivisions (e.g., planning, purchasing, logistics, trade management) as little more than necessary evils and cost centers. Yet it’s an inescapable fact that many of the biggest and best-run companies got to where they are thanks to their adoption of best practices to manage their world-class supply chains.

This book, then, is designed to help you figure out how you can get your own company on the “best practices” track. It will explain why there is
so much interest in supply chain management today by offering numerous examples of companies that have found success by focusing on specific processes within their supply chains. Through anecdotes, interviews, case studies, research, and analysis, the book will explore the development of supply chain management by looking at some of the people and the businesses largely responsible for its momentum.

For most of the three years since the first edition was published, I was editor-in-chief of *IndustryWeek*, the leading magazine for manufacturing management, and in that role I had the opportunity to visit manufacturing plants, distribution centers, major ports, third-party logistics operations, and various government offices throughout North America, Europe, and Asia. In preparing this second edition, I have added a significant amount of new material and additional best practices to each chapter, with the goal of producing as timely and relevant a book as possible. This current edition also includes two entirely new chapters devoted to perhaps the two hottest buzzwords in supply chain and manufacturing circles today: green and lean.

The book is organized into three sections. Part I opens with a brief introduction to supply chain management (Chapter 1), looks at examples of some best-in-class supply chains in a number of different industries (Chapter 2), and discusses ways to measure the performance of a supply chain (Chapter 3). (For those readers who are interested in an entire book devoted to supply chain basics, I recommend Michael Hugos’s *Essentials of Supply Chain Management, Second Edition*, also published by John Wiley & Sons.)

Part II presents the traditional core processes of supply chain management. Chapters 4 through 11 follow the progression of plan, source, make, deliver, and return and related points in between, and discuss in detail the best practices being followed by specific trendsetting companies.

Part III looks at best practices in strategic areas that have become increasingly important to supply chain management since the turn of the millennium: outsourcing (Chapter 12), collaboration (Chapter 13), security (Chapter 14), radio frequency identification (Chapter 15), green supply chains (Chapter 16), and continuous improvement and lean management (Chapter 17). Finally, Chapter 18 focuses on the ultimate best practice: hiring and developing best-in-class supply chain personnel.
The genesis for writing this book came largely from a need to clean up my office. I've been writing about supply chain management for a long time, dating back to the days when nobody even used the words “supply chain,” and being a pack rat, I have several filing cabinets' worth of notes, interview transcripts, research studies, surveys, press kits, and article clippings, as well as several shelves stuffed with reference books. One day, staring at my daunting collection of supply chain stuff, the thought occurred to me: “Surely, there’s got to be a book somewhere in all of this.” And indeed there was, eventually.

I mention this to dispel the myth that every book emerges fully formed from the divinely inspired mind of the author. Nothing could be further from the truth. This book evolved by fits and starts from the writing and editing I’ve done over two decades, most particularly the decade I’ve spent as chief editor or editorial director of Penton Media’s supply chain group of publications, including *Supply Chain Technology News*, *Logistics Today*, *Material Handling Management*, and *IndustryWeek*.

This book also references the reporting of many fine journalists who have worked with me and for me, and many of the insights on the following pages originated with them (and are duly noted throughout the book). In alphabetical order, I’d like to acknowledge and publicly thank Mary Aichlmayr, Dan Jacobs, Jill Jusko, Jonathan Katz, Brad Kenney, Jennifer Kuhel, Roger Morton, Traci Purdum, Helen Richardson, Adrienne Selko, Sarah Sphar, John Teresko, Perry Trunick, and Nick Zubko for their contributions.

It’s always good to thank your bosses, so thanks to those I’ve worked for at Penton since the late 1990s, namely Newt Barrett, Dave Madonia, Teri Mollison, Ron Lowy, Steve Minter, and John DiPaola. And special thanks to Bob Rosenbaum, not only because he had the good sense to hire me, but because he showed me that it was possible to write a supply chain book in the evenings and on weekends without completely losing your mind.

Not to single anybody out, but I also have to thank Nick Lester, Dick Green, Craig Shutt, Andy Horn, Steve Kane, and Paul Beard—just because.
I’m especially indebted to all the supply chain professionals who shared their experiences and insights with me. And of course, this book wouldn’t have been possible without the good graces of the fine folks at John Wiley & Sons, particularly Tim Burgard.

Finally, thanks to my friends and family, who supported me enormously throughout the writing process and offered endless encouragement. Special thanks go to my parents, Jack and Dottie Blanchard, for their lifelong support; to my daughters, Julia and Grace, for being the greatest kids a dad could ever want, who never complained about seeing only the back of my head on some weekends, and who celebrated with me every time I’d finish another chapter; and most of all, to Nancy, my wife and soulmate. WEATSIA!
Supply Chain Management
Best Practices
PART I

Introduction to Supply Chain Management
CHAPTER 1

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

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
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.
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.

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
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.”

### 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,
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. 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.

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:

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).
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