

DAVID BLANCHARD

SUPPLY CHAIN MANAGEMENT BEST PRACTICES

THIRD EDITION



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Table of Contents

[Cover](#)

[Title Page](#)

[Copyright](#)

[Dedication](#)

[Preface](#)

[Acknowledgments](#)

[PART 1: Introduction to Supply Chain Management](#)

[CHAPTER 1: If Supply Chain Is the Answer, Then
What's the Question?](#)

[You Knew This Job Was Dangerous When You
Took It](#)

[The Big Picture](#)

[The Supply Chain's Back Story](#)

[Roadblocks on the Supply Chain Path](#)

[Separating the Good from the Best](#)

[Notes](#)

[CHAPTER 2: Anatomy of a Supply Chain](#)

[Aerospace: Changing the Game, for Better or
Worse](#)

[Consumer-Packaged Goods: The Moment of
Truth](#)

[Food and Beverage: Cutting Out the Middleman](#)

[Healthcare: Driving Out Waste](#)

[Industrial Products: Diversity in the Supply
Chain](#)

[Oil and Gas: Managing the Managers](#)

[Pharmaceuticals: Innovation in Real Time](#)

[Retail: It's Amazon's World—We're Just Shopping in It](#)

[Notes](#)

[CHAPTER 3: Supply Chain Metrics](#)

[How to Prevent a Supply Chain Heart Attack](#)

[What Makes a Supply Chain Leader?](#)

[Measure Satisfaction](#)

[Everybody's Talking About Benchmarking](#)

[Do the Right Things](#)

[Setting Your Sights High](#)

[Supply Chain Checkup](#)

[Learn the SCOR](#)

[SCM for Dummies](#)

[Follow the Roadmap](#)

[Make It All Meaningful](#)

[Focusing on the Customer](#)

[Notes](#)

[PART 2: Traditional Core Processes of Supply Chain Management](#)

[CHAPTER 4: Planning and Forecasting](#)

[A Bias Against Good Plans](#)

[From Soup to S&OP](#)

[No Time Like the Real Time](#)

[End-to-End Integration](#)

[Analyze This](#)

[A Happy Ending](#)

[Notes](#)

[CHAPTER 5: Procurement](#)

[A Formula for Success](#)

[Managing the Changes](#)

[Keep Your Friends Close and Your Suppliers Closer](#)

[Looking Backward to See Forward](#)

[Ensuring a Healthy Supply Chain](#)

[It Seemed Like a Good Idea at the Time](#)

[An Online Car Wreck](#)

[A Rating Service for Buyers and Sellers](#)

[Sustainable Sourcing Pays Off](#)

[Closing the Loop](#)

[Notes](#)

[CHAPTER 6: Manufacturing](#)

[The Toyota Way](#)

[Nearly Perfect](#)

[Leaning into Quality](#)

[Don't Settle for Occasional Improvement](#)

[The Value of Teamwork](#)

[Leaning in the Right Direction](#)

[Smart Manufacturing, Smarter Supply Chains](#)

[Supply Chain in 3D](#)

[Collaborating on Product Designs](#)

[The Future of Manufacturing](#)

[Notes](#)

[CHAPTER 7: Transportation](#)

[Riding the Roads](#)

[Regulations and Deregulation](#)

[Fuel for Thought](#)

[A Capacity for Change](#)

[Know Thyself, and Thy Carrier, Too](#)

[Collaboration Is a Two-Way Street](#)

[A Carrier by Any Other Name](#)

[Automate to Consolidate](#)

[Autonomous Vehicles on Land, Sea, and Air](#)

[Do-It-Yourself Logistics](#)

[The Last Mile](#)

[Get It There on Time](#)

[Notes](#)

[CHAPTER 8: Distribution and Warehousing](#)

[Omni-Channel Surfing](#)

[A Great Idea in Theory](#)

[Virtual Inventory](#)

[Cross-Docking, Compliance, and Collaboration](#)

[Handle with Care](#)

[Saving on Labor](#)

[How to Better Manage Your Warehouse](#)

[Design for Supply Chain](#)

[Striking the Proper Balance](#)

[A Site for Sore Eyes](#)

[How Much Is Too Much?](#)

[A Quick Guide to Site Selection](#)

[The Three Deadly Sins of Warehousing](#)

[Notes](#)

[CHAPTER 9: Globalization](#)

[Playing by Somebody Else's Rules](#)

[Develop a Global Vision](#)

[Following the Plan](#)

[Friendly Nations](#)

[“Low Cost” Sometimes Means “Poor Service”](#)

[Total Cost of Supply Chain](#)

[Take a Look for Yourself](#)

[Finding the Next Global Hot Spot](#)

[The Need for Supply Chain Visibility](#)

[Shoring Up the Supply Chain](#)

[There's No Place Like Home](#)

[Notes](#)

[CHAPTER 10: Customer Service](#)

[The Perfect Order](#)

[The High Cost of Imperfection](#)

[Every Day Is a Holiday](#)

[One Good Return Deserves Another](#)

[Supply Chain in Reverse](#)

[Money in the Bank](#)

[A Better Way to Sell Mouthwash](#)

[A Nine-Step Program for CPFR](#)

[Don't Expect Collaboration to Be Easy](#)

[Respecting Your Partners](#)

[A Culture of Customer Satisfaction](#)

[How to Get the Most Out of a Relationship](#)

[Notes](#)

[PART 3: Supply Chain Strategies](#)

[CHAPTER 11: 3PLs](#)

[A Shift to the Supply Chain Side](#)

[Letting Somebody Else Do It](#)

[Supply Chain Essentials and Nonessentials](#)

[Finding Your Core Competency](#)

[The Same Set of Eyes](#)

[The Financial Impact of Outsourcing](#)

[Staying in Touch](#)

[Going Beyond the 3PL Model](#)

[Outpacing the Competition](#)

[Higher Demands, Higher Expectations](#)

[Notes](#)

[CHAPTER 12: Risk Management](#)

[Reducing Your Vulnerability](#)

[Don't Let Their Problems Become Your Problems](#)

[Shelter from Supply Chain Storms](#)

[Cybersecurity Blanket](#)

[Customs-Trade Partnership Against Terrorism](#)

[Getting Countries to Talk to Each Other](#)

[“It'll Never Happen Here”](#)

[Taking Responsibility for Your Supply Chain](#)

[Securing the Supply Chain](#)

[Taking Steps Toward Effective Compliance](#)

[An Investment Worth Making](#)

[Business as Unusual](#)

[Notes](#)

[CHAPTER 13: Supply Chain Technology](#)

[Getting the Job Done with AI](#)

[The ABCs of RFID](#)

[Proactive Replenishment](#)

[In Search of Payback](#)

[Work the Bugs Out](#)

[A Block Off the Ol' Chain](#)

[An Interconnected Collection of Technologies](#)

[Reinvent, Rethink, Reimagine](#)

[Notes](#)

[CHAPTER 14: Corporate Social Responsibility](#)

[Champions of CSR](#)

[Corporate Irresponsibility](#)

[Who's Minding the Supply Chain?](#)

[The Black Elephant in the Room](#)

[The Carbon Footprint of a Banana](#)

[Don't Reinvent the Wheel](#)

[Bridge Over Muddled Waters](#)

[Eco-Friendly Strategies](#)

[Notes](#)

[CHAPTER 15: The Financial Supply Chain](#)

[A Convergence of Talent](#)

[Zero Hour for Budgeting](#)

[Roll with the Changes](#)

[Supply Chain Finance: Part Strategy, Part Technology](#)

[Financials on the Rocks](#)

[Show Me the Money](#)

[Notes](#)

[CHAPTER 16: The Supply Chain Profession](#)

[People Management](#)

[Talent Search](#)

[Hiring Problem Solvers](#)

[Training the Next Generation](#)

[Toy Stories](#)

[Gray Matters](#)

[How Diverse Is Your Supply Chain?](#)

[What Keeps You Up at Night?](#)

[The Secret to Supply Chain Success](#)

[Notes](#)

[About the Author](#)

[Index](#)

[End User License Agreement](#)

Supply Chain Management Best Practices

Third Edition

DAVID BLANCHARD

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To Nancy, Julia, and Grace

Preface

When I wrote the first edition of this book, the terrorist attacks of September 11, 2001, were still fresh in people's minds and the world was still grappling with new security procedures that changed travel, security, and global supply chains in ways that nobody could have imagined pre-9/11. The US Department of Homeland Security was as frequently mentioned in supply chain circles as the IRS is mentioned at accounting firms. It was pretty much accepted as gospel that the world as we knew it had been changed forever. Welcome, the saying went, to the New Normal, characterized by stringent security measures that would slow global trade to a near halt as cargo and passengers alike would need to be thoroughly screened at every land, sea, and airport.

I wrote the second edition a few years later when the United States, and pretty much the rest of the world, was plunged in what came to be known as the Great Recession. The housing market had tanked, the stock market had crashed, unemployment had spiked, and the new “New Normal,” we were told, would be an economy of very modest growth. Supply chain professionals were being advised to go lean—not just following the principles of continuous improvement, but preparing for an economy that might never fully bounce back.

That brings us to this third edition, which was written while the entire world was grappling with the COVID-19 pandemic. At this writing, while we seem to have gotten past the worst of the virus, and while the rapid development and distribution of vaccines are bolstering hopes that the pandemic could soon be downgraded to just a really bad health situation, it's unclear as to exactly

when, or if, we'll see what the Next Normal looks like. It's safe to say that even after the impact of COVID-19 has faded somewhat into memory, there will always be another crisis or another “we've never seen anything like this before” moment on the global supply chain stage.

*

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 16 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 a diverse group of trade publications, I've had access to supply chain professionals at companies of all sizes, in dozens of different industries. So in writing this book throughout its three editions, 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, transportation, warehousing) largely as cost centers or as the group to blame when deliveries are late or shelves are empty. Yet it's an inescapable fact that many of the biggest and best-run companies got to their positions of dominance 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.

Since the late 1990s, thanks to the industry consolidation in my own chosen field (media and publishing), I've worked for three different companies (Penton, Informa, and Endeavor) but the same group of publications. While I've covered such industry sectors as safety, corporate finance, and manufacturing, I've consistently maintained a supply chain beat for well over 20 years. In the course of writing the three editions of this book, I've had the opportunity to visit manufacturing plants, distribution centers, major ports, third-party logistics operations, and various government offices throughout North America and Latin America, Europe, and Asia. In preparing this third 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.

The second edition was in print for over 10 years, so for this third edition I have updated the material wherever necessary, particularly in areas where the companies mentioned in previous editions have substantially changed their business model, have been acquired or otherwise no longer exist in their previous incarnation, or in some cases, when more recent examples made my points better. Best practices are not etched in stone, and what worked in 2007 or 2010 may have been improved upon, so I've replaced some case studies with more current examples. However, based on the feedback I received from course instructors who have used this book as a textbook and plan to do so in the future, I have kept the same basic structure to the book, and if the best practices mentioned in previous editions are still widely accepted and in use today, I have left those sections intact. And sometimes good stories are still good stories, even a decade later.

*

The book is organized into three parts. [Part 1](#) 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](#)).

[Part 2](#) presents the traditional core processes of supply chain management. [Chapters 4](#) through [10](#) follow the progression of plan, source, make, deliver, return, and enable, and related points in between, and discuss in detail the best practices being followed by specific trendsetting companies.

[Part 3](#) looks at best practices in strategic areas that have become increasingly important to supply chain management as we settle into the third decade of this century: third-party logistics ([Chapter 11](#)); risk

management and business continuity, including a look at how supply chains reacted to the COVID-19 pandemic ([Chapter 12](#)); supply chain technology ([Chapter 13](#)); sustainability and corporate social responsibility ([Chapter 14](#)); and an all-new chapter on supply chain finance ([Chapter 15](#)). Finally, [Chapter 16](#) focuses on the ultimate best practice: hiring and developing best-in-class supply chain personnel.

Acknowledgments

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' and countless jumpdrives' 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—in fact, with this current edition there have been three, and my collection of book material shows no sign of shrinking.

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 over time from the writing and editing I've done for the past three decades, especially the two decades I've spent in editorial management of various supply chain publications—including *Supply Chain Technology News*, *Logistics Today*, *Material Handling & Logistics*, and *IndustryWeek*—for Penton Media/Informa/Endeavor Business Media. Throughout my tenure with the company (the corporate owner of the magazines changed over the years, but I stayed put), I've also edited several other publications not necessarily supply chain-focused but whose readers were heavily influenced and impacted by the vagaries of the supply chain, such as *EHS Today* and *Business Finance*, and this book reflects my awareness of how the supply chain's influence continues to spread throughout all areas of an organization.

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, Peter Alpern, Tom Andel, Jill Jusko, Jonathan Katz, Brad Kenney, Bill King, Jennifer Kuhel, Steve Minter, Roger Morton, Helen Richardson, Adrienne Selko, Sarah Sphar, John Teresko, Perry Trunick, Laura Walters, Clyde Witt, and Nick Zubko for their contributions.

It's always good to thank your bosses, so thanks to those I've worked for at Penton/Informa/Endeavor since the late 1990s, namely Newt Barrett, Dave Madonia, Teri Mollison, Ron Lowy, Steve Minter, Pat Panchak, Karen Field, Travis Hessman, 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 in particular I'm eternally grateful for the collected wisdom and insights of the *Material Handling & Logistics* Editorial Advisory Board. And of course, this book wouldn't have been possible without the good graces of the fine folks at John Wiley & Sons, and for this third edition I'd like to thank in particular Sheck Cho, Susan Cerra, and Samantha Enders.

Finally, special thanks go to my parents, Jack and Dottie Blanchard, for their lifelong support. My dad passed away while I was writing this third edition, but his spirit fills

every page. Thanks to my friends and family, especially my siblings and my son-in-law Joe, who supported me throughout the writing process and offered endless encouragement. I want to thank my daughters, Julia and Grace, for being there with me along every step of this trilogy-writing journey. Over the course of these three editions they've grown from young girls into difference-making young women who constantly inspire me. And most of all, I'd like to thank my wife and soulmate Nancy, who gives meaning to my life every day. WEATSIA!

PART 1

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 lifecycle, 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 fuel costs or industry consolidation or next-day delivery expectations from your customers. 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% 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%, or less. Preferably less.

As you stand waiting for the Keurig machine to brew your much-needed second cup of coffee for the morning, your director of sales approaches you with a sheepish smile and asks if you can arrange for an extra thousand widgets to be made and shipped to a big customer by the end of next 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 the 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 Internet of Things (IoT) initiative. The Department of Defense (DoD), another big customer, has started using IoT technology to keep better track of its inventory. Your boss wants you to figure out how IoT is going to help your company and result in more business from the DoD. 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—no easy accomplishment given that the start-up costs on

sensors and other hardware alone could quickly add up to \$1 million for a limited trial.

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, though, he's already launched into a harangue about automation. 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 deployed automated guided vehicles in their warehouses. So when you get back to the office, he wants you to figure out which type of warehouse robot can manage your facility better, faster, and cheaper for you. Your customer service levels, needless to say, cannot change in the slightest, unless of course they actually improve. And make sure the union steward knows this technology investment won't lead to any layoffs.

Oh, and one more thing, your boss adds as you get up to leave the restaurant: He wants you to schedule another trip to Asia (your seventh trip there in three years). It's time, he says, to get serious about this corporate social responsibility stuff, and he wants you to oversee an audit of your offshore suppliers.

Most of your afternoon is spent trying to mend some fences down in the information technology (IT) 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 an outbreak of a disease nobody even heard of a month ago spreads throughout the region where one of your key suppliers is located. Oh, and a big storm is developing in the Atlantic Ocean, and another one of your 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 the cloud-based supply chain alert dashboard app 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 smartphone 12 inches away from you 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, customers will be satisfied, 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. For instance, since online retailer Amazon's supply chain is based on a model of guaranteed deliveries and free shipping, that's become the de facto model for *all* online retail companies, or for that matter, for *any company in any industry*. However, while Amazon can deploy its own warehouse robots and trucks to ensure your new desk lamp arrives by Thursday, ExxonMobil relies on an entirely different distribution network to move its products from pipeline to refinery to tanker to gas station. So, the idea that “one supply chain strategy fits all” is as wrong-headed as thinking that 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, headlights) are sold as parts, everything that happens in between those “dirt-to-dirt” milestones encompasses some aspect of the supply chain.

APICS 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 six words: *plan, source, make, deliver, return, and enable*.¹ While it's difficult to find a consensus in any field, let alone a field that intersects with so many disparate disciplines, that six-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.”²

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 further than the late 1950s to the pioneering research conducted by Jay Forrester and his colleagues at the Massachusetts Institute of Technology (MIT). 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.³ 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, long-time director of supply chain management programs (now retired) at the University of Wisconsin.⁴

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 has been 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 chain⁵ 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).⁶

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