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Chapter **1**

The Growing Demand for Supply Chain Management

These days, it's hard to find a copy of *The Wall Street Journal* that doesn't have the phrase *supply chain* somewhere on the first page. You hear about supply chains everywhere: in company reports, on the news, and even in casual conversation. But it hasn't always been that way. Only in the past 40 years has supply chain management gone from being a vague academic concept to a critical business capability. In this chapter, I cover why supply chain management has become so important and explain the process for building best-in-class supply chain management capabilities into your company.

Defining Supply Chain Management

Over the past few years, supply chains have been blamed for shortages of toilet paper, computer chips, and baby formula. Supply chains have been targeted by politicians and policy experts who were concerned about the environment and the

economy. Supply chains have even become part of popular culture, with rock star Jack White naming his 2022 concert tour, “The Supply Chain Issues Tour.”

In spite of the current hype, supply chains aren’t really that new. Entrepreneurs have been buying things from suppliers and selling products to customers for almost as long as people have inhabited the earth. Supply chain *management* is new, however, and that’s because the world is changing.

The basic principles of supply chain management began to take shape in the 1980s as researchers saw how interconnected the world was becoming. At that time, the world population was only about 4.5 billion, with a majority of people living in rural areas. Today the population has grown to 8 billion people, and the majority of us now live in urban areas. There are a lot more people on the planet today than there have been in the past, and we all want lots and lots of stuff.

Supply chains are the complex systems made up of people, processes, and technologies that we engineer and manage to deliver the goods and services customers value. *Supply chain management* is the planning and coordination of the relationships between all the people, processes, and technology involved in creating that value. Managing a supply chain effectively involves aligning all the work inside your company with the things that are happening outside your company. In other words, it means looking at each business as a single link in a long, end-to-end chain.



TIP

The word *value* shows up a lot when people talk about supply chain management. Basically, *value* means *money*. If a customer is willing to pay for something, it has value.

Negotiating prices, scheduling manufacturing, and managing logistics all affect the value created by a company, and they’re critical to a supply chain, but because they’re so interdependent, it’s a bad idea to manage them separately in silos. As companies grow larger, supply chains get longer, and the pace of business gets faster, it has become more important to align the various functions in a supply chain. Ironically, many of the strategies and metrics that businesses relied on in the past, and that managers have been taught to use, can actually create serious problems for a supply chain. A sales rep might hit their quota by landing a huge deal with a customer, for example, but the deal might be unprofitable for the company because of the costs it will drive to the logistics and manufacturing functions. A buyer might negotiate a volume discount from a supplier without considering how much more it will cost to store and protect all of that extra inventory. Supply chain management helps sales, logistics, manufacturing, procurement, and all your other functions get aligned to ensure that decisions are good for the whole business.



TIP

The difference between the amount of money your company brings in (revenue) and the amount of money it spends (costs) is your profit. In other words, your profit is the value that you have captured from your supply chain.

Companies that do a good job of managing their supply chains are better able to take advantage of value-creation opportunities their competitors might miss. Implementing lean manufacturing, for example, can companies reduce inventories. Being responsive to customer needs can help them grow their sales. Collaborating with suppliers can ensure better access to materials.

Some supply chain management professionals are generalists, and others are specialists. Generalists look at the big picture; specialists focus on a particular step in the supply chain. At the end of the day, they all need to understand the effects of their decisions in order to ensure that revenue is greater than costs while meeting the needs of their customers. That's why supply chain management has become so important.

Making Tough Business Decisions

Managing a supply chain is complicated: So many moving pieces are involved, and so many things can change in an instant, that making long-term plans seems virtually impossible. How can you really plan for commodity price swings, natural disasters, and financial meltdowns, all at the same time? But you can't ignore those possibilities, either. Instead, you need to think about them and design your supply chain so that it can function well under a range of scenarios. In other words, you want your supply chain to be *resilient*.

A good way to start improving resilience is to practice scenario planning. Think about the many possibilities that the future holds, try to imagine each one as a series of events, and then think about how those events would affect your business. To use scenario planning to prepare for the unknown and the unknowable, you need to understand three really important things:

- » Which scenarios are most important to you.
- » What you'll do — and how — in each scenario. (Each scenario calls for a different plan.)
- » How you can tell when a scenario is becoming reality.

It helps to have sensors that tell you what's happening, and triggers that help you decide when to implement which plan. When you use scenario planning, supply

chain management becomes a process of planning ahead, sensing changes, and responding to triggers. Figure 1-1 shows how sensors help you recognize which scenario is unfolding so that you can implement the proper plan.

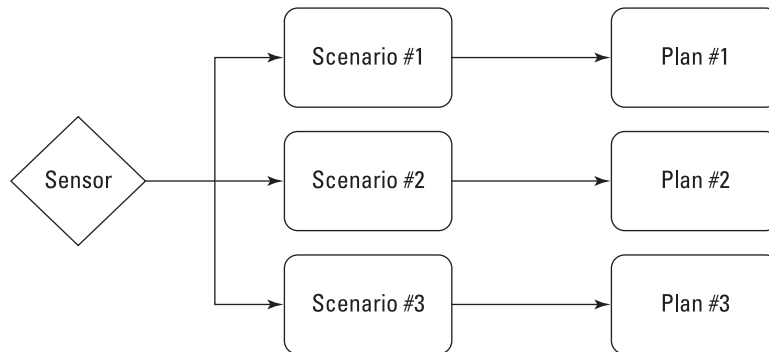


FIGURE 1-1:
Scenario-planning
model.

I can explain this concept with a few practical examples:

- » You run a manufacturing company that imports products from overseas, so you need to consider what you'd do if one of your inbound shipments is lost at sea, impounded by customs, captured by pirates, or caught in a port strike. Your sensor could be a notification system that sends alerts about your shipments. One plan might be shutting down your factory until the issue is resolved. You might also consider placing a new order with a different supplier. In an extreme case, you might declare *force majeure* and tell your customers that you won't be able to fulfill your commitments to them.

Force majeure is a legal term that means you are free from liability if you are unable to meet obligations due to an extraordinary circumstance.

- » You work for a wholesaler that has been selling a product at a steady rate for months, and one month, the company sells twice as much as normal. You don't have enough inventory to fill all your customer orders, and now you also have back orders to fill. You may even be at risk of losing sales and customers. You might decide to place bigger orders in the future and keep more inventory on hand. That means you'll be investing more working capital in inventory.
- » You work for a transportation company. The company's customers pay you to deliver their products around the world, and they count on your deliveries to help them meet their commitments to their own customers. Therefore, your ability to deliver on time is essential to them. Suddenly, a volcano in a distant part of the world spews ash far into the sky, making it dangerous for airplanes to use a heavily traveled flight path. You could reroute your planes, but this is



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expensive because you would need to develop new flight plans, reschedule airplanes, and find available crews. Alternatively, you could tell your customers that their deliveries are on hold until normal operations can resume.

Thousands of companies have had to face every one of these scenarios in the past few years. In every case, making the right decision about how to respond required understanding supply chains and supply chain management. As you read this book, you will discover topics that can help you create more accurate scenarios and better plans for responding to them.



TIP

You can find more information about supply chain scenario planning, as well as a link to the MIT Scenario Planning Toolkit, in Chapter 15.

The next sections cover ten supply chain management principles, five supply chain tasks, six supply chain capabilities, and the five steps for implementing a new supply chain agenda. Each section provides a slightly different perspective on supply chain management, but the sections explain the same challenge in different ways. The supply chain management principles express the essence of supply chain management. The five supply chain tasks are like the job description of a supply chain manager. And the New Supply Chain Agenda is a strategy for planning and implementing effective supply chain management practices.

Operating Under Supply Chain Management Principles

Many people try to define supply chain management by talking about what they do, which is a bit like describing a cake by giving someone a recipe. A different approach is to explain what supply chain management creates. To continue the cake analogy, that approach communicates how the finished cake tastes and what it looks like.

The key supply chain management principles illustrated in Figure 1-2 are good places to start.

Customer focus

Supply chain management starts with understanding who your customers are and why they're buying your product or service. Any time customers buy your stuff, they're solving a problem or filling a need. Supply chain managers must understand the customer's problem or need and make sure that their companies can satisfy it better, faster, and cheaper than any competitors can.

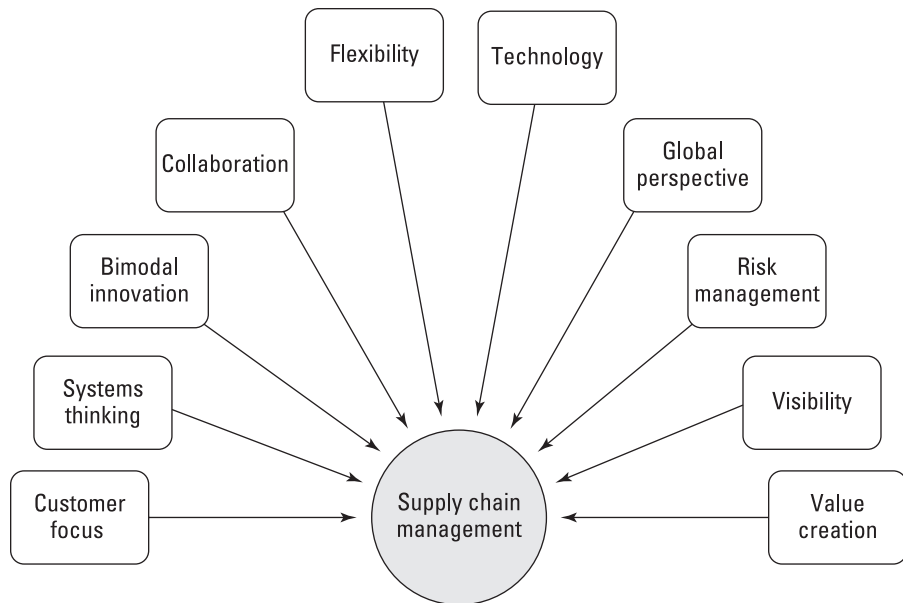


FIGURE 1-2
Supply chain management principles.

Systems thinking

Supply chain management requires understanding the end-to-end system — the combination of people, processes, and technologies that must work together so that you can provide your product or service. Systems thinking involves appreciation of the series of cause-and-effect relationships that occur within a supply chain. Because these systems are complex, supply chains often behave in unpredictable ways, and small changes in one part of the system can have major effects somewhere else.

Bimodal innovation

The world of business is changing quickly, and supply chains need to keep up by innovating. Two kinds of innovation are important for supply chains:

- » **Sustaining innovation:** *Sustaining innovation* is built on continuous process improvement techniques such as Lean, Six Sigma, and the Theory of Constraints (see Chapter 16). Sustaining innovation isn't sufficient, though, because new technologies can disrupt industries. So you also need to pursue disruptive innovation.
- » **Disruptive innovation:** *Disruptive innovation* introduces a product, process, or service that creates new markets and destroys established paradigms. When a disruptive solution is accepted, it becomes the new dominant paradigm.

If you're in the business of making buggy whips, you need to figure out how to make buggy whips better, faster, and cheaper than your competitors do, as well as what the new dominant paradigm is going to be so that you'll know what to do when buggy whips are replaced by a different technology.

Collaboration

Supply chain management can't be done in a vacuum. People need to work across departments inside an organization, and they need to work with suppliers and customers outside the organization. A “me, me, me” mentality leads to transactional relationships in which people focus on short-term opportunities while ignoring the long-term results. This situation costs more money in the long run because it creates lack of trust and unwillingness to compromise. An environment in which people collaborate for shared success is much more profitable than an environment in which each person is concerned only with their own success. Also, a collaborative type of environment makes working together a lot more fun.

Flexibility

Because surprises happen, supply chains need to be flexible. Flexibility is a measurement of how quickly your supply chain can respond to changes, such as an increase or decrease in sales or an interruption of supply. This flexibility often comes in the form of buffers such as extra capacity, multiple sources of supply, and alternative forms of transportation. Usually, flexibility costs money, but it also has value. The key is understanding when the cost of flexibility is a good investment.

Suppose that only two companies in the world make widgets, and you need to buy 1,000 widgets per month. You may get a better price on widgets if you buy all of them from a single supplier, but then if that supplier experienced a disruption you would be in serious trouble. Buying some of your widgets from a second supplier is a way to increase flexibility.



TIP

Think of the extra cost that you pay for the second supplier as a kind of insurance policy. You're paying more up front, but you're increasing your supply chain flexibility and protecting yourself from a possible disruption.

Technology

The rapid evolution of technology has transformed the way that supply chains work. A few years ago, we ordered things from catalogs, mailed in checks, and waited for our packages to be delivered. Today, we order products on our phones,

pay for them with credit cards, and expect real-time updates until those packages are delivered to our doorsteps. Supply chain management requires understanding how technologies work and how to integrate them to create value at each step in the supply chain.

Global perspective

The ability to share information instantly and to move products around the world cheaply means that every organization today operates in a global marketplace. No matter what product or service you provide, your company is global in some way. As a supply chain manager, you must recognize how your business depends on global factors to supply inputs and drive demand for outputs. You also need to think globally about competition. After all, your company's real competitive threat could be on the other side of the planet.

Risk management

When you combine high-performance requirements with complicated technologies and dependence on global customers and suppliers, you have a recipe for chaos. Lots of variables mean that many things can go wrong. Even a small disturbance, such as a shipment that gets delayed, can lead to a series of problems farther down the supply chain — stockouts, shutdowns, penalties, and more. Managing a supply chain means being aware of risks and implementing processes to detect and mitigate threats. Stability may be the key to making supply chains work smoothly, but risk management is the key to minimizing the costs of dealing with surprises. Risk management can even help you grow your business during times of uncertainty.

Visibility

You can't manage what you can't see, so supply chain management makes visibility a priority. Knowing what's happening in real time (or close to real time) lets you make better decisions faster. Visibility comes at a cost, however: You have to build your supply chain in a way that lets you capture data about key steps in the process. The value of visibility is that it lets you make decisions based on facts rather than on intuition or uncertainty.

Value creation

Supply chain management is about creating value — meeting your customers' needs in the right place, at the right time, at the right level of quality, for the

lowest cost. This value is the heart of supply chain management. If I had to pick just one principle to describe the whole process of supply chain management, it would be value creation.

Introducing Five Supply Chain Tasks

James B. Ayers is a supply chain management expert who works with manufacturers, service companies, and government agencies. In *Handbook of Supply Chain Management*, 2nd Edition (Auerbach Publications, 2006), Ayers says that supply chain managers should concentrate on five tasks:

- » **Designing supply chains for strategic advantage:** Consider how your supply chain can help you create value by operating better, faster, and cheaper than your competitors. Think beyond just lowering costs, and consider ways in which your supply chain can help you grow revenue, innovate, and even create new markets.
- » **Implementing collaborative relationships:** Consider how you can get teams to work together toward a goal rather than compete for conflicting objectives. If your sales team is trying to improve customer service by making sure that plenty of inventory is available, and your logistics team is trying to reduce inventory to lower costs, both teams are probably going to waste a lot of energy.
- » **Forging supply chain partnerships:** Consider how you can build and sustain strong relationships with customers and suppliers. When companies understand that they depend on one another for success — and perhaps survival — working well together becomes a priority.
- » **Managing supply chain information:** Consider how you share information with others in ways that create value for everyone. When retailers share sales data with their upstream partners, the manufacturers and distributors do a better job of scheduling production and managing inventory. When manufacturers share data about commodity prices and capacity constraints, retailers can do a better job of managing pricing.
- » **Making money from the supply chain:** Consider how you can use your supply chain design, relationships, partnerships, and information to capture value for your company. In supply chains, a process change in one part often creates value for someone else. Find ways to share this value so that everyone has an incentive to work together.

Creating Six Supply Chain Capabilities

Supply chains are evolving quickly, and the authors of the book *Digital Supply Networks* (McGraw Hill, 2020) argue that we need to combine technologies into a digital core that provides a business with six capabilities:

- » **Digital development:** Using digital tools such as computer-aided design (CAD) and 3D printing to accelerate product development
- » **Synchronized planning:** Sharing goals across business functions and adapting to changes quickly
- » **Smart factory:** Using sensors and robots to automate production processes
- » **Intelligent supply:** Having visibility to your suppliers, and their suppliers, while automating purchases and payments
- » **Dynamic fulfillment:** Using tools such as an order management system (OMS) to quickly fill orders from customers, ensuring that you deliver the right products to the right place, at the right time, and at the lowest cost
- » **Connected customer:** Using technology such as customer relationship management (CRM) systems to remember what customers have purchased and anticipate their future needs



TIP

In Part 3 of this book there's a detailed explanation of these technologies, and many others, and how they work together to create a digital supply network.

Implementing the New Supply Chain Agenda

One of my favorite books about supply chain management is *The New Supply Chain Agenda*, by Reuben Slone, J. Paul Dittmann, and John T. Mentzer (Harvard Business Review Press, 2010). It breaks down the challenge of supply chain management from the point of view of senior executives. The authors talk about working capital and liquidity, strategy, and alignment, and then lay out a five-step system for making a company better at supply chain management. The five steps of *The New Supply Chain Agenda* are:

- » **Placing the right people in the right jobs:** To implement supply chain strategies, everyone needs to understand how their job affects other people inside your company, as well as the people up and down the supply chain.

- » **Putting the right technology in place:** Supply chains depend on technology. Each business, and each function within each business, has different technology needs.
- » **Focusing on internal collaboration:** Adopting a supply chain perspective helps you break down the silos that keep people in your company from collaborating with one another effectively. Everyone needs to understand the company's strategy and work toward common goals.
- » **Directing external collaboration:** Traditional business relationships are transactional and often self-centered. Buyers and suppliers approach each deal as a win-lose game: The suppliers are trying to inflate their profits, and the buyers are trying to squeeze them on price. When building supply chain relationships, each partner helps to maximize total value along the entire supply chain.
- » **Applying project management:** Supply chains are dynamic and companies respond to changes with projects. Teaching people how to manage projects well and having professional project managers involved are the keys to ensuring that your supply chain evolves as your customers, suppliers, and company change.

