

Making the Supply Chain



Management Business Case



MANAGEMENT ACCOUNTANTS ARE AN INTEGRAL PART OF THIS PROCESS

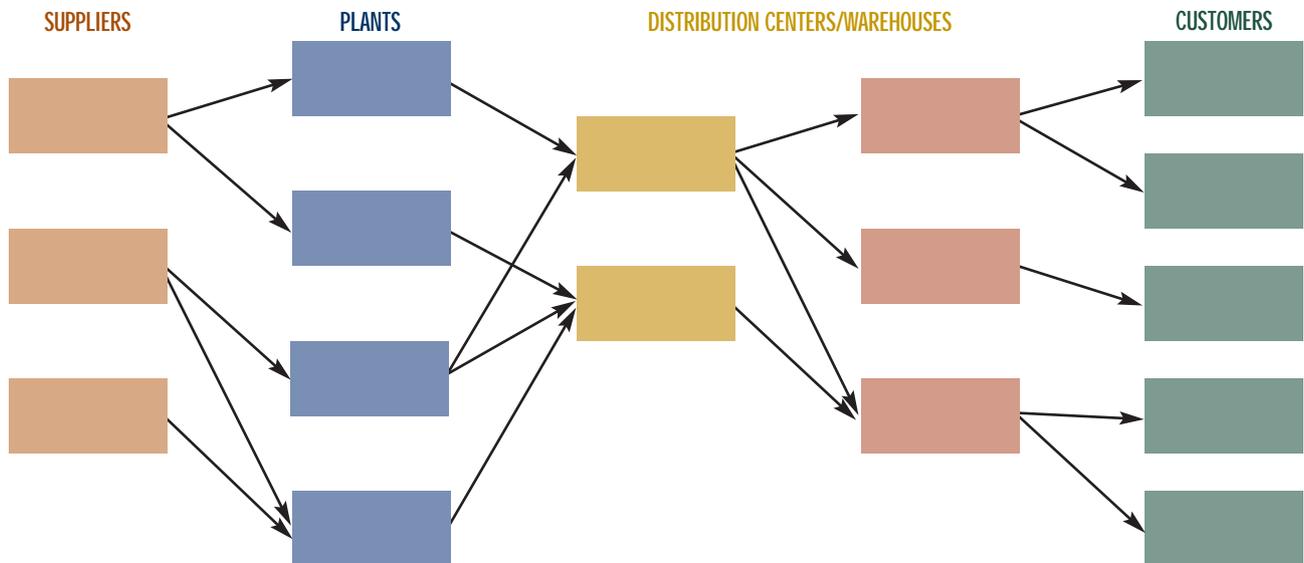
BY SCOTT HADLEY

During the “e-business” boom of the late 1990s and early 2000, supply chain management (SCM) was much ballyhooed as the next competitive weapon for companies in the manufacturing, distribution, and retail industries. In fact, the core element of many e-business initiatives was based on it. Then came the demise of the dot-coms, which had a negative impact on many costly SCM projects and created skepticism about the concept’s value. In retrospect, the failure of many of these initiatives can be attributed to the lack of a solid business case outlining the requirements for the value of the SCM project to be realized, not to the lack of a value proposition for SCM.

Regardless of company size, from multinationals to single-site manufacturers, the core value proposition of SCM is to improve corporate profitability and return on capital through cost reduction (via reduced inventory, improved throughput, and better procurement) and increased revenues (via reduced time to market and improved product availability). Having access to accurate information surrounding relevant costs is essential to achieving maximum benefit from an SCM initiative.

“The Case for Management Accounting” article in the October 2003 issue highlighted the frustration of senior American managers with the lack of effective cost and resource management capability within their organizations. Since the bulk of most companies’ costs can be directly attributed to activities within the supply chain, it’s important to align the requirements of the management accounting teams with those of the supply chain teams and practices. I’ll show you how this alignment can take place so that realistic business cases can be developed for SCM initiatives.

Figure 1: A Typical Supply Chain



THE SUPPLY CHAIN

Before discussing SCM, let's review what a supply chain is. A supply chain can be described as the set of suppliers, manufacturers, wholesalers, distributors, and stores that enable a product or service to be made, sold, and delivered to the consumer and end user. Figure 1 gives an example of a supply chain and shows how it touches almost every functional area within an organization.

THE ROLE OF THE SUPPLY CHAIN

The main purpose of the supply chain is to support the overall competitive strategy and goals of the corporation, so the supply chain strategy must be aligned with the corporation's competitive strategy. Depending on the industry, a range of valid competitive strategies exist, including low-cost provider, leading-edge products, brand dominance, customer service, and customer experience.

In the retail industry, for example, Wal-Mart aims to be a reliable source of a wide variety of brand-name products at everyday low prices. Wal-Mart has exerted an enormous effort to drive the costs of its supply chain that allow it to be a low-cost retailer. Alternatively, the Gap focuses on providing its customers with trendy products and an enjoyable customer experience. To provide a quality customer experience, the Gap's supply chain strategy includes the placement of many smaller retail outlets as opposed to a few larger ones.

For a company to create the greatest value, each functional area within the organization must be aligned with the overall competitive strategy. In general, there are three

key functional strategies: sales and marketing, supply chain, and product development. Supporting these are the cross-functional strategies of finance, information technology, and human resources.

Just as SCM plays a key role in delivering the supply chain strategy, customer relationship management (CRM) and product life-cycle management (PLM) play key roles in delivering the sales and marketing and the product development strategies, respectively. As a result, SCM, CRM, and PLM processes need to be closely aligned to drive the greatest business value.

SUPPLY CHAIN MANAGEMENT

The term *supply chain management* is relatively new. Although there are many different definitions, the core elements of each definition focus on the management of processes and activities that are used to integrate and manage the activities and resources that impact the supply chain.

Supply chains contain a tremendous number of business processes and activities, each with a wide variety of costs, capacities, and constraints. For instance, the costs associated with manufacturing, logistics, and procurement activities have a significant impact on the supply chain's efficiency and performance.

For the past four decades or more, assorted strategies, concepts, and tools have been developed that focus on various operational aspects of the supply chain, including manufacturing, logistics, procurement, and sales forecasting. SCM has focused on the operational-level activities

Table 1: Consumer Goods Segment

	COGS % of revenue	Year-over-Year Change in COGS	Total Supply Chain Costs % of revenue	Profitability
Mature SCM companies	46.5%	-3.2%	8%	23.4%
Immature SCM companies	50.1%	2.8%	10%	10.9%

such as material handling, issuing purchase orders, material requirements planning (MRP), releasing work orders, and taking customer orders. Management accountants have contributed to many improvements at the execution level of SCM through the deployment of activity-based costing (ABC) methods.

In recent years, technological advancements have enabled the development of SCM applications that can be classified as tactical and even strategic. These advances have opened up a new element of SCM often referred to as supply chain planning (SCP) or advanced planning solutions (APS). Affected business processes include demand planning, sales and operations planning, capacity planning, and distribution planning.

The goal of supply chain planning is to create plans that minimize total supply chain costs while maintaining desired customer service levels. This can only be done when SCP uses accurate and relevant cost information. Management accountants, therefore, are critical to SCP's success.

A conundrum that arises in SCM is that *total* supply chain costs aren't necessarily minimized when each individual function (e.g., manufacturing, warehousing, transportation) optimizes its own performance metrics.

Consider the following example. A production department strives to minimize the cost per unit of production, so it manufactures in long production runs to minimize its changeover and setup costs. This lengthens the production cycle time, which, in turn, increases inventory requirements, creating higher carrying costs. This strategy is commonly employed in asset-intensive industries (e.g., steel manufacturing or pulp and paper) where it's desirable to maximize return on expensive assets.

Conversely, when responsiveness to market is a key element of the corporate strategy, a company will design the supply chain to support flexibility. These companies tend to focus on minimizing inventory at the expense of production efficiency.

The challenge of SCM, and SCP in particular, is to assess the infinite trade-offs across the entire supply chain to support the competitive strategy in the most effective and efficient manner. This requires the active involvement of both operational personnel and managerial finance professionals.

“So what? What is the benefit of advancing my SCM practices?”

To whet your appetite, consider the findings of a 2003 cross-industry case study (“The 2003 Retail & Consumer Goods Shared Strategy Study,” RIS Consumer Goods Technology, PRTM, published by Edgell Communications, 4 Middlebury Blvd., Randolph, NJ 07869, (973) 252-0100, edgell@edgellmail.com), which quantified the benefits in terms of profitability and total supply chain costs. The results are compelling. Companies that employ advanced SCM practices:

- ◆ Are approximately 40% more profitable,
- ◆ Have a 1% to 2% advantage in total supply chain costs,
- ◆ Are experiencing year-over-year decreases in cost of goods sold (COGS) as a percentage of revenue, as opposed to others that are experiencing year-over-year increases.

Table 1 shows an example from the consumer goods segment, and the answer to “so what?” is quite clear. Advanced supply chain practices are used by the most competitive companies, and the trend in the change in COGS indicates the advantage will continue to grow.

“I’m not convinced. How can the benefits be this substantial?”

Consider a hypothetical medium-sized company with the following financial data:

Annual Sales	\$250 million
Cost of Goods Sold	\$150 million
Direct Materials	\$105 million
Direct Labor	\$15 million
Contractors	\$30 million
Tax Rate	30%
Net Profit	\$25 million
Inventory	\$21 million
Cost of Capital	10%

For the sake of brevity, I'll focus on three areas affected by supply chain initiatives: production, inventory, and customer service.

Production

Some of the earliest initiatives in supply chain planning were in the area of *finite scheduling*. The aim of finite scheduling is to schedule and sequence the required production operations within the four walls of a manufacturing facility.

Scheduling traditionally was done “by hand” by experienced plant personnel, who constructed the schedule using a combination of experience, “rules of thumb,” and intuition. The scheduler’s primary focus was to develop a feasible schedule that completed orders on time while taking the capacities and capabilities of the plant into account. Costs were rarely taken into account in the manual scheduling process.

Advanced finite scheduling applications are usually interactive and iterative. These applications usually include features that allow:

- ◆ Creation of a schedule from scratch,
- ◆ Development of a manual schedule, and
- ◆ Improvement or repair of an existing schedule.

The benefits of these applications include the ability to improve on the efficiency of a schedule by using mathematical techniques, which consider many more alternatives than the human scheduler can.

The resulting schedules tend to:

- ◆ Have fewer and more efficient changeovers and setups;
- ◆ Balance the multiple stages of production, reducing downtime that results from waiting for materials;
- ◆ Balance the workload across resources, reducing overtime and idle time.

Bottom line: These applications can improve productivity and asset utilization, decrease production costs, and improve customer service levels.

To illustrate, assume that 15% of the labor expense (\$2.25 million) for our hypothetical company comes from overtime, which is paid at 1.5 times regular rates. Approximately 90% of production time is worked by regular labor and the remaining 10% by overtime labor.

Consider a production planning initiative that improves throughput by a conservative 5%. This reduces the total labor requirement to 95% of former levels. Assuming overtime is used only to meet production requirements, this means that the 5% improvement goes directly to reducing overtime. The benefit is a 50% reduction in the overtime budget.

From a financial perspective there’s a:

- ◆ Cost reduction of \$1.125 million,
- ◆ 0.75% overall reduction in COGS, and
- ◆ \$787,500 increase in after-tax profit.

Inventory

The role of inventory in the supply chain is worth analyzing because not all inventory is “undesirable,” and not all inventory is “desirable.”

Inventory can be desirable in some circumstances. For instance, on the raw materials side, the purchasing department may achieve a price break by buying in large quantities. In this case, the volume purchases increase inventory, but the savings realized by the price break may more than offset additional carrying costs.

Similarly, the lower per-unit production costs realized from longer production runs may offset the increased carrying costs of the correspondingly higher work-in-process and finished-goods-inventory levels.

On the other hand, a significant portion of inventory may not be desirable. This undesirable inventory usually is used as a buffer, providing the company with the ability to respond to unforeseen circumstances or unplanned events within the supply chain. If you had a crystal ball, there would be no need for this buffer.

The greatest variability and source of uncertainty in the supply chain arises from the inability to predict customer demand accurately. Yet uncertainty exists in almost all operational elements of the supply chain. Production yields and throughput will fluctuate in unpredictable ways, delivered quantities will differ from what was ordered, and delivery and production dates may vary from requested or planned dates.

There are two ways to remove this unwanted inventory from the supply chain. The first is to find a crystal ball. The second is to improve the responsiveness of the supply chain and its associated processes.

Several initiatives

Depending on the circumstances of the company, there are many different initiatives that can be used to manage inventory levels more efficiently. Some of the more common ones include:

- ◆ Demand planning/forecasting,
- ◆ Sales and operations planning, and
- ◆ Collaboration/information sharing.

Demand planning. The primary goal of a demand planning initiative is to gain a more accurate understanding of future demand. Ideally, you would like to know exactly how much demand there will be for each product at each location/channel in each time period. The most common demand planning applications use statistical techniques to forecast demand, and more advanced applications make additional use of collaborative technologies to facil-

itate the fine-tuning by the sales and marketing teams. The use of advanced applications often allows companies to cut forecast error in the range of 10% to 40%. In essence, this provides a crystal ball effect that, when incorporated with other SCM processes, can result in:

- ◆ 10% to 50% lower inventories,
- ◆ Up to 15% reduction in spoilage/obsolete losses, and
- ◆ Up to 10% increase in sales.

Sales and operations planning. Using the forecast as an input, the sales and operations planning (S&OP) process develops coordinated medium-term plans for the rest of the enterprise. They include plans for procurement/sourcing, production, inventory (raw materials, work-in-process, finished goods), and distribution. The goal of S&OP is to support the competitive strategy of the company by developing realistic, achievable, and cost-effective plans for the various functional teams, including sales, marketing, logistics, manufacturing, and procurement.

In a sense, the S&OP process creates forecasts for the requirements and operations of the rest of the organization. Because it gives each individual department a better understanding of the plans for the rest of the company, it eliminates much of the uncertainty of department managers and planners and reduces the need for undesirable inventory. Companies that employ an advanced S&OP process in conjunction with an advanced demand planning process realize the greatest benefits. It isn't uncommon to achieve:

- ◆ 25% to 50% lower inventories,
- ◆ 10% to 50% fewer expedites, and
- ◆ 50% to 75% fill-rate improvement (e.g., improve 90% fill rate to 98+% fill rates).

An important yet less tangible benefit of advanced S&OP is that it dramatically improves a company's responsiveness. It's quite common for companies to move from monthly planning to weekly and sometimes even daily planning.

Collaboration. Collaboration and information-sharing initiatives appear in many areas. For instance, in demand planning, advanced practices include collaborating with customers through data and information sharing. In the S&OP process, the various departments within a company collaborate and share information. Just-in-time inventory practices are made possible only through timely information sharing with suppliers and transportation providers.

Revisiting our hypothetical company, assume that, through adoption of one or more advanced supply chain practices, it is able to reduce inventory by 20%. The net

result is a reduction in cash flow of \$4.2 million and annual savings of \$420,000 in carrying costs.

Customer Service

Improved placement and deployment of inventory in the company results in a higher incidence of "having the right product in the right place at the right time." This has two benefits, one direct and one indirect.

The direct benefit is that customer service levels are improved because there are fewer stock-outs. In a stock-out situation, one of two things occurs. With luck, the customer will be willing to wait until the product is in stock before making the purchase. If not, the customer finds another source or forgoes the purchase altogether, resulting in a lost sale. The rate at which stock-outs result in lost sales depends on the industry and product. For instance, the conversion rate for a product with high brand loyalty (e.g., automobiles, soft drinks) is very low, whereas a product that is viewed as a commodity (e.g., gasoline, milk, lumber) will have a much higher loss-conversion ratio. This means that people will wait if they are loyal to a brand. For example, if I go to the store to buy Coca-Cola, but it's out of stock, I won't buy Pepsi. I'll wait until I can get the Coca-Cola. On the other hand, if I go to buy "Brand A" milk, and it's out of stock—I will buy "Brand B" milk instead.

Improving customer service levels from 90% to 95% will result in a 2%, or \$5 million, increase in sales. The 10% profit margin implies an additional \$500,000 in profit. In our hypothetical company, assume that 40% of stock-outs result in lost sales. That is, 40% of the time that a customer requests the product and it isn't available, they either buy a substitute product or forgo the purchase altogether. The other 60% of the time they wait until the desired product is available and buy it then.

The indirect benefit from fewer stock-outs is lower transportation costs. To maintain customer service levels in a stock-out situation, companies often transfer stock from one location to another, serve the customer from a different location, or expedite a shipment to meet the demand. Unfortunately, each of these options increases overall supply chain costs.

ROBUSTNESS

So far you've seen that improvements in the supply chain can deliver significant demonstrable value to a company. One thing I haven't touched on yet is that improved SCM practices result in a more robust supply chain, which means that the supply chain operates

according to plan and with fewer disruptions. Disruptions often cause rush orders or expedited shipments. In fact, many organizations employ people who are dedicated solely to expediting—also known as “firefighting.” A robust supply chain will have fewer, and less intense, fires to fight.

Expediting has a disproportionate impact on costs. For example, consider expediting the delivery of a customer order by sending it LTL (less than truckload) or by courier rather than in a normal TL (truckload) shipment. The additional cost will reduce the order’s profitability.

From a production environment perspective, consider the impact of a rush order. The production line needs to:

- ◆ Stop production;
- ◆ Reconfigure—i.e., change over and set up;
- ◆ Run the new production; then
- ◆ Reconfigure again to resume production.

This disruption often has a negative impact on other parts of the organization. For example, if raw materials arrive on a JIT (just-in-time) basis, the unscheduled production will impact the scheduled receipts of raw materials and create congestion at the unloading docks and in the receiving area. Similarly, other activities that are dependent on the production schedule—such as packing, materials handling, and storing—will be impacted.

IS THIS REAL?

A quick Internet search will yield many real-world examples of companies that have exceeded the conservative estimates from our hypothetical company. For example, from the consumer packaging industry, adhesive and sealant maker 3M Canada has been able to:

- ◆ Improve productivity by 20%,
- ◆ Increase customer services levels from 92% to 98%, and
- ◆ Reduce inventory by 23%.

They achieved these improvements by modernizing their production planning processes with advanced supply chain software rather than continuing to use a 20-year-old MRP application. (You can read a case study called “Replacing Inventory with Information at 3M Canada” at www.i2technologies.com/assets/pdf/DD9F7212-997B-4525-A13F6247C9002D53.pdf.)

From the industrial manufacturing segment, Hoffman Enclosures advanced its SCM practices through a number of initiatives that:

- ◆ Improved productivity by 20%,
- ◆ Reduced inventory by 20%,

- ◆ Improved inventory accuracy from 97% to 99%,
- ◆ Decreased cycle time for custom products by 60%,
- ◆ Increased customer service levels from 92% to 98%.

(You can read this case study, “Hoffman Slashes Inventory and Manufacturing Cycle Times,” at www.peoplesoft.com/media/en/pdf/success/hoffman_ss_1103.pdf.)

These are just two of many documented cases of the benefits that have been achieved with improved supply chain management.

MANAGEMENT ACCOUNTANTS, TAKE NOTE

The primary role of SCM is to ensure the efficient execution of a company’s supply chain strategy, which, in turn, will contribute to improved and stronger customer relationships. Thus, superior supply chain management practices clearly lead to improved corporate performance. In particular, opportunities exist to significantly improve many financial and operational measures such as:

- ◆ Inventory,
- ◆ Cost of goods sold,
- ◆ Cash-to-cash cycle time,
- ◆ Revenue per fixed assets,
- ◆ Asset utilization, and
- ◆ Revenues.

Advances in recent years have allowed costs to become a significant driving force in the development of supply chain practices. To truly understand supply chain costs, you need to fully understand direct costs and indirect costs and their interdependencies. Management accountants are experts in identifying, measuring, reporting, and analyzing information about their company’s economic events. By developing methods, reports, and data to support advanced SCM practices, they can uncover tremendous hidden value throughout the company.

Any team undertaking a supply chain initiative should include management accountants, especially those with supply chain management experience. They are well positioned to develop and articulate the supply chain management business case! ■

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