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About the Supply Chain Operations Reference Model

Peter was introduced to the Supply Chain Operations Reference model (SCOR) in the fall of 1996 as part of a newly formed corporate “internal consulting” team for Imation, which had just been spun off from 3M. He’d been using it in supply chain project work ever since. He has also been active in the Supply-Chain Council, involved in the process of improving SCOR, and teaching others how to use it.

So he’s heard all the questions. Among those most frequently asked are: What is the Supply-Chain Council? What is SCOR? How do I use SCOR? What is the value to my organization? How do I learn more about SCOR?

■ The Supply-Chain Council

The Supply-Chain Council (supply-chain.org) is an independent not-for-profit corporation formed in 1996 as a grassroots initia-

tive to develop a supply chain implementation model. Among those involved at the start were individuals from such organizations as Bayer, Compaq, Procter & Gamble, Lockheed Martin, Nortel, Rockwell Semiconductor, Texas Instruments, 3M, Cargill, Pittiglio, Rabin, Todd, & McGrath (PRTM), and AMR Research, Inc. In all, sixty-nine of the world's leading companies participated in the council's founding. Its mission today is to perpetuate use of the SCOR model through technical development, research, education, and conference events. By the end of 2001, the council's technical community had released five subsequent versions of SCOR, providing updates to process elements, metrics, practices, and technology.

The council has attracted about 750 members worldwide, with chapters in Europe, Japan, Korea, Latin America, Australia, New Zealand, and Southeast Asia. Membership is open to any organization interested in applying and advancing principles of supply chain management. There are five special-interest industry groups within the council: aerospace and defense, automotive, electronics, retail and consumer packaged goods, and pharmaceuticals. Members work in private-sector companies, academics, government, consulting firms, and technology service providers. In 2002, a corporate membership cost \$2,000 a year and the educator's fee was under \$300. With permission, attached as Appendix A is the SCOR overview available in PDF form from the Supply Chain Council's Web site.

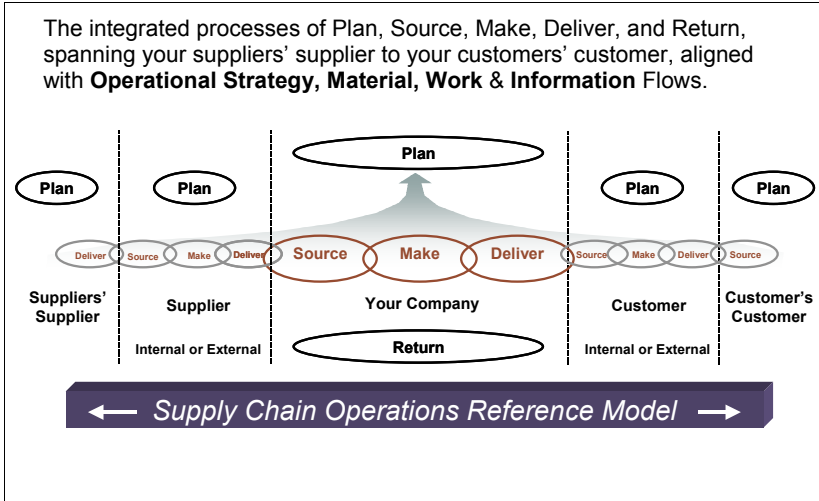
■ The SCOR Framework

SCOR combines elements of business process engineering, benchmarking, and leading practices into a single framework. Under SCOR, supply chain management is defined as these integrated processes: PLAN, SOURCE, MAKE, DELIVER, and RETURN—from the suppliers' supplier to the customers' customer, and all aligned with a company's operational strategy, material, work, and information flows. (See Figure 1-1.)

Here's what's included in each of these process elements:

- *PLAN*. Assess supply resources; aggregate and prioritize demand requirements; plan inventory for distribution, produc-

Figure 1-1. SCOR framework.



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tion, and material requirements; and plan rough-cut capacity for all products and all channels.

- ❑ **SOURCE.** Obtain, receive, inspect, hold, issue, and authorize payment for raw materials and purchased finished goods.
- ❑ **MAKE.** Request and receive material; manufacture and test product; package, hold, and/or release product.
- ❑ **DELIVER.** Execute order management processes; generate quotations; configure product; create and maintain customer database; maintain product/price database; manage accounts receivable, credits, collections, and invoicing; execute warehouse processes including pick, pack, and configure; create customer-specific packaging/labeling; consolidate orders; ship products; manage transportation processes and import/export; and verify performance.
- ❑ **RETURN.** Defective, warranty, and excess return processing, including authorization, scheduling, inspection, transfer, warranty administration, receiving and verifying defective products, disposition, and replacement.

In addition, SCOR version 5.0 includes a series of enable elements for each of the processes. Enable elements focus on infor-

mation policy and relationships to enable the planning and execution of supply chain activities.

SCOR spans all customer, product, and market interactions surrounding sales orders, purchase orders, work orders, return authorizations, forecasts, and replenishment orders. It also encompasses material movements of raw material, work-in-process, finished goods, and return goods. In version 5.0, SCOR specifically does not address sales processes, product development, and customer relationship management processes.

The SCOR model includes three levels of process detail. In practice, Level One defines the number of supply chains and how their performance is measured. Level Two defines the configuration of planning and execution processes in material flow, using standard categories like stock, to-order, and engineer-to-order. Level Three defines the business process used to transact sales orders, purchase orders, work orders, return authorizations, replenishment orders, and forecasts.

■ The SCOR Project Roadmap

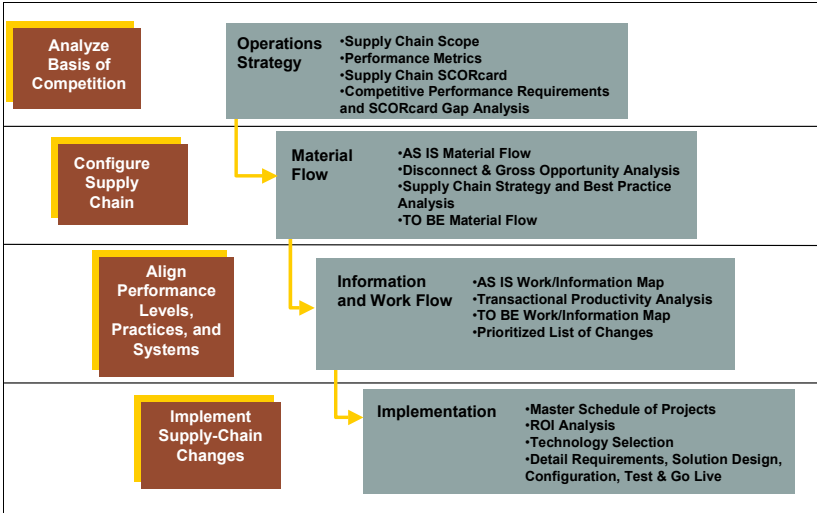
While the framework seems simple, there are multiple levels of detail integrating more than sixty process steps, 200 metrics, fifty leading practices, and a hundred potential material flow configurations.

Simply having the dictionary does nothing to save money. You need to do something with it. That's what the SCOR Project Roadmap is about. (See Figure 1-2.) In four distinct segments, the roadmap addresses operational strategy, material flow, and work and information flow. The segments are:

1. Analyze your basis of competition, which focuses on supply chain metrics and operations strategy.
2. Configure supply chain material flow.
3. Align performance levels, practices, and systems—the information and work flow.
4. Implement the supply chain changes to improve performance.

Each segment is comprised of deliverables that help a company understand and improve a specific dimension of supply

Figure 1-2. SCOR project roadmap.



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chain performance. The first segment helps to understand how many supply chains a company has and how they are performing compared to the competition. The second segment helps to optimize material flow inefficiency. The third helps to optimize transactional productivity. And the fourth helps to plan and implement supply chain improvements.

The SCOR Project Roadmap can be applied to projects of narrow scope, or broad-based initiatives that integrate many supply chains across multiple trading partners. It can work for manufacturers, distributors, retailers, value-added resellers, wholesalers, dealers, franchises, and service providers. It does well in a subordinate role within Six Sigma and Lean Enterprise infrastructures. And with a little creativity, the model can even be used to assemble sophisticated Internet-based trading networks, exchanges, and portals.

■ Applying the SCOR Project Roadmap

For all its power and flexibility, however, there are some essential success factors that are between the lines of the project roadmap—things like change management, problem-solving

techniques, project management discipline, and business process engineering techniques. These are essential to a successful project and are not explicitly discussed. In other words, the roadmap can tell you where to go, but it can't teach you how to drive the car. This book attempts to fill in the lines and provide a comprehensive guide to using SCOR. (See Figure 1-3.)

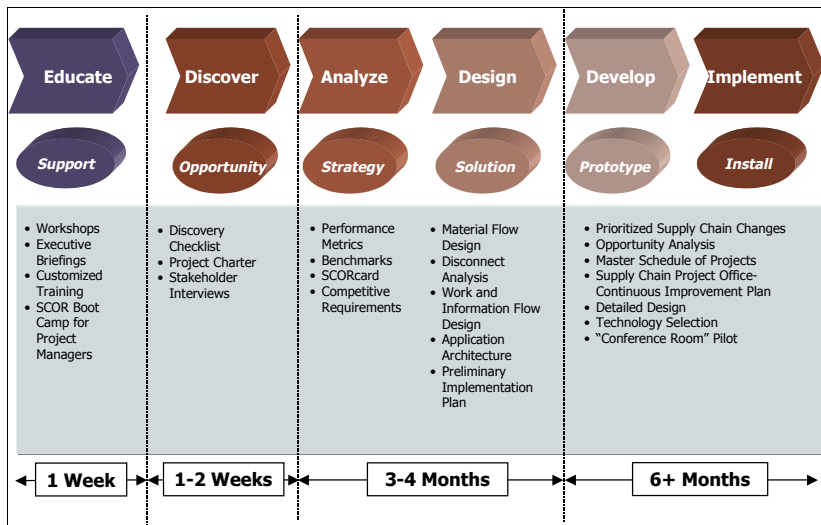
The phases of a SCOR project as detailed in this book are:

- ❑ Educate for support
- ❑ Discover the opportunity
- ❑ Analyze
- ❑ Design
- ❑ Develop and implement

Educate for Support

Chapter 2 examines this phase of a SCOR project. Find an “evangelist” in the company who has the passion to lead a supply chain project and an executive to actively sponsor it. Both must be willing to invest personal time to learn SCOR. If an

Figure 1-3. SCOR project approach.



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executive delegates this initial learning, the organization will probably fail to sustain change over time.

With an evangelist and sponsor in place, the next step of educating for support is to establish a core business team to buy into the approach and commit to supporting a project with words and deeds.

Even as these steps are taking places, there is a larger learning curve that every company must follow. It begins with general education about SCOR—how it works, the language in which it's written, and the available tools to support it. This chapter provides a basic introduction, but is not enough to be considered a general education like the curriculum provided by the Supply-Chain Council.

The next educational step is conceptual application of SCOR to your own company. At this stage, a real supply chain in the company is researched and summarized as a business case. Then, in a classroom environment, a trip with the project roadmap is simulated.

The third educational stage is to apply the roadmap to a real project, setting expectations and results. Using a formal SCOR coach helps to expand the learning process from individuals to the organizations by including necessary teams.

Finally comes implementation of the supply chain improvement projects.

Discover the Opportunity

Discovery (Chapter 3) helps to form the business case that justifies spending money on a supply chain project. It's where the business team sorts out performance opportunities. The complexity of supply chain discovery can be visualized as a three-dimensional box of questions. The first dimension asks: At what performance level is your supply chain operating? The second dimension asks: Do we have the right strategy as well as the right work, information, and material flows to support the desired performance level? The third dimension asks: What other performance factors will impact the supply chain? These include organizational, process, and technology issues, in addition to

understanding people-related factors such as skill, knowledge, and ability.

One of the key outcomes from the discovery step is a project charter, which organizes the supply chain opportunity into the approach, budget, organization, clear measures of successes, and communication plan.

The Analysis Stage

The analysis stage (Chapters 4 through 7) is where the value proposition is articulated in terms that the financial management of a company requires: cash-to-cash cycle time, inventory days, order fulfillment, and other performance factors. SCOR helps the team to prioritize and balance customer metrics with internal-facing metrics: delivery, reliability, flexibility/responsiveness, cost, and assets. The resulting SCORcard provides a direct connection to the balance sheet.

Performance requirements are established with respect to your competition and are prioritized by both definitions of a supply chain—product and channel. These priorities will help in the design phase of a SCOR project. The SCORcard also summarizes actual performance against benchmark performance with a gap analysis that defines the value of improvements.

The Design Phase

The design phase is divided into material flow (Chapters 8 through 13) and work and information flow (Chapters 14 through 18).

Material flow and work/information flow are the two key components for defining AS IS flows, uncovering disconnects in your processes, and mapping out TO BE flows that eliminate these gaps. The basic questions addressed are: What are my material flow problems and what's it worth to solve them? How efficient is my work and information flow and what's it worth to change them?

Develop and Implement

This book leads to development of a portfolio of projects (Chapter 19) with a projected return on investment. Developing and implementing each project follows industry standard practices of initiating, planning, executing, and formal closing. The detailed development, planning, and rollout of individual projects is the subject of another book.

■ The Value of a SCOR Initiative

Using the SCOR approach is reliable and predictable with respect to project duration, cost, and benefits. SCOR projects have been carried out with such base metrics as stock price improvement, income statement and balance sheet improvement, purchase of technology through cash-flow improvements, cost reduction, and ERP optimization.

Implementation results include:

- ❑ An average of 3 percent as a percentage to total sales operating income improvement for the initial SCOR project portfolio derived from cost reduction and service improvement
- ❑ Two- to six-times return-on-investment (ROI) within twelve months, often with cost-neutral quick-hit projects underway on a six-month timeframe
- ❑ Full leverage of capital investment in systems improving return on assets (ROA) for fixed-asset technology investments
- ❑ Reduced information technology (IT) operating expenses through minimized customization and better use of standard system functions
- ❑ Ongoing updates to a project portfolio, using continuous supply chain improvement to drive profit improvement at 1 percent to 1-to-3 percent per year