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## Supply Chain Management

t has been a true privilege to write this book—for the information necessary to write it came from many wonderful people: first, all the authors who wrote the more than 400 books, articles, and papers that went into the readings that were necessary to understand what supply chain management (SCM) is all about; second, the over 50 executives in major global companies who were generous enough with their time to be interviewed on their opinions of the scope and nature of SCM; third, the faculty, students, and practitioners who regularly participate in the meetings of the University of Tennessee's Supply Chain Management & Strategy Forum for their insights and critiques; and finally, the practitioners in the many companies that make up the examples and case studies in this book (my especial gratitude for their willingness to have their companies profiled, though disguised, in these pages). It is the in-depth experience we gained through working with these companies that led to the real purpose of the book: how to use supply chain management to drive competitive advantage.

# Why Supply Chain Management as a Source of Competitive Advantage?

Why do so many people spend so much time thinking, writing, and doing SCM? The answer is that it is a considerable source of competitive advantage in the global marketplace. But why? The fierce competition in today's markets is led by advances in industrial technology, increased globalization, tremendous improvements in information availability, plentiful venture capital, and creative business designs (Bovet & Sheffi, 1998). In highly competitive markets, the simple pursuit of market share is no longer sufficient to ensure profitability and, thus, companies focus on redefining their competitive space or profit zone (Bovet & Sheffi, 1998). For example, companies pursue cooperative

relationships to capture lifetime customer share rather than mass market share through systematic development and management of cooperative and collaborative partnerships (Gruen, 1997). Markets have been changed by such factors as power shifts from corporate buyers to end users, the requirement for mass customization, globalization, time, and quality-based competition, advances in technology, increasing knowledge intensity, and changing government policies.

Power in a broad spectrum of supply chains has shifted downstream toward the customer or end user (LaLonde, 1997) and, as a result, customer satisfaction becomes the ultimate goal of a company. As the customer increasingly is in charge in the marketplace, interfirm cooperation is critical to satisfy customers. Manufacturers and their intermediaries must be nimble and quick or face the prospect of losing market share and, thus, relationships and predictable performance become very important in a supply chain (LaLonde, 1997).

Mass customization provides a tremendous increase in variety and customization without sacrificing efficiency, effectiveness, or low costs (Pine, 1993). In other words, customers want low cost with high levels of service, and customization with availability (Bovet & Sheffi, 1998). Pine (1993), therefore, argues that mass customization can be achieved only through the committed involvement of employees, suppliers, distributors, retailers, and end customers.

Firms are competing in a global economy and, thus, the unit of business analysis is the world, not just a country or region. The communications revolution and globalization of consumer culture will not tolerate hand-me-down designs or excessive delivery times (Bovet & Sheffi, 1998). In this context, Kotler (1997) states, "As firms globalize, they realize that no matter how large they are, they lack the total resources and requisites for success. Viewing the complete supply chain for producing value, they recognize the necessity of partnering with other organizations."

Time- and quality-based competition focuses on eliminating waste in the form of time, effort, defective units, and inventory in manufacturing-distribution systems (Larson & Lusch, 1990; Schonberger & El-Ansary, 1984; Schultz, 1985). In addition, there has been a significant trend to emphasize quality, not only in the production of products or services, but also throughout all areas in a company (Coyle, Bardi, & Langley, 1996).

LaLonde and Powers (1993) suggest that the most profound and influential changes that directly affect companies are information technology and communications. With the advent of modern computers and communications, monolithic companies, which had become highly bureaucratic, started eroding. Fast communication that links all the members of a company decreased the need for multiple layers of people who were once the information channel and control mechanism. The decreased cost and ready availability of information resources allow easy linkages and eliminate time delays in the network (LaLonde & Powers, 1993).

In the new competitive landscape, knowledge (information, intelligence, and expertise) is a critical organizational resource and is increasingly a valuable source of competitive advantage (Hitt, Ireland, & Hoskisson, 1999). Similarly, LaLonde and Powers (1993) characterized the 1990s as the era of reassembly or reintegration after that of disintegration. Current reintegration is based not on position or prescribed roles in a hierarchy; it is based on knowledge and competence (LaLonde & Powers, 1993). Bringing together the knowledge and skills to effectively serve the market requires coordination (Malone & Rockart, 1991).

Finally, government policy may encourage cooperative strategies among firms. The U.S. 1996 Telecommunications Act and subsequent court battles have created significant uncertainty for the firms involved, and consequently a significant number of alliances have emerged (Hitt et al., 1999). The enactment of the U.S. National Cooperative Research Act of 1984, as amended in 1993, eased the U.S. government's antitrust policy to encourage firms to cooperate with each other to foster increased competitiveness of American industries (Bowersox & Closs, 1996; Barlow, 1994).

Today's business environment puts stress on both relations with customers and the service provided such customers (Hitt et al., 1999). Kotler (1997) argued, "Customers are scarce; without them, the company ceases to exist. Plans must be laid to acquire and keep customers." The level of competition to capture customers in both domestic and international markets demands that organizations be quick, agile, and flexible to compete effectively (LaLonde, 1997; Fliedner & Vokurka, 1997). This quick, agile flexibility cannot be obtained without coordination of the companies in the supply chain.

Through all the sources mentioned earlier (the literature, executive interviews, and companies with which we have worked), we identified 12 drivers of competitive advantage that result from supply chain management, and these are the focus of this book. We will introduce these drivers later in this chapter, and each (with numerous examples) will be the subject of a subsequent chapter. However, first we need to explore the concept of supply chain management, starting with the discipline in which it originated—logistics.

## **Logistics and Supply Chain Management**

The Council of Logistics Management, the "preeminent worldwide professional association of logistics personnel" (CLM, 2003), defines logistics as

that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.

This definition tells us that logistics is managing all the movement and storage activities that are associated with product and service flows. It is focused on what we call the "focal organization," that is, on managing that organization's inbound and outbound flows of goods, services, and related information. We can imagine that "related information" encompasses inventory quantities and locations, order status, shipment status and location, transportation status and vehicle location, and so forth. But what about information that flows up and down a supply chain that is not related to the flow of goods and services? Information on marketing plans, advertising effectiveness, pricing structure, product management status, ownership and title, and financial status do not seem to be within the realm of logistics. For that matter, what about actual financial flows?

Arguably, SCM has risen to prominence from its beginnings in the logistics literature (Cooper, Lambert, & Pagh, 1997). For example, at the 1995 Annual Conference of the Council of Logistics Management, 13.5% of the concurrent session titles contained the words "supply chain." At the 1997 conference, just 2 years later, the number of sessions containing the term rose to 22.4%. However, there are clearly flows up and down the supply chain that are not part of the CLM definition of logistics. CLM acknowledges that SCM is something more than logistics by stating, "Logistics is that part of the supply chain process that..." So, SCM must encompass logistics and these other flows mentioned above.

It was this realization that led the Supply Chain Research Group at the University of Tennessee (Mentzer, 2000) to define SCM as

the systemic, strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.

Unlike logistics, which focuses on the inbound and outbound flow of products, services, and related information from a focal organization's perspective, this definition leads us to the conclusion that SCM is a management process that deals with inbound and outbound flows, from the perspective of the focal organization, its suppliers, and its customers. This means a fundamental aspect of supply chain management is the consideration of not just the cost and profit goals of one company (the focal organization), but of all the companies involved in managing the supply chain.

This led the Supply Chain Research Group at the University of Tennessee (Mentzer, 2000) to define a supply chain as

a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finances, and information from a source to a customer.

Since SCM involves managing inbound and outbound flows so that all companies involved benefit, it follows that a supply chain must entail three or more separate entities (companies). Further, the scope of SCM is much more than just inbound and outbound flows of products, services, and related information—it encompasses all the inbound and outbound flows between organizations in the supply chain. When we put together these definitions of supply chains and SCM, we realize that SCM is the strategic management of all the traditional business functions that are involved in any flows, upstream or downstream, across any aspect of the supply chain system.

Thus, SCM encompasses all the traditional business functions, their coordination within individual companies, and their coordination across companies in the supply chain. Mentzer (2000) illustrated this with Figure 1.1 (see page 23). First, supply chains today consist of all suppliers and customers, and they exist in a global environment. We know of no company that does not sell in a global market, source globally, or compete with a company that does. Second, all the traditional business functions must be coordinated within individual companies before they can be coordinated across companies in the supply chain (more on this in Chapter 2). Third, the intracompany concepts of trust, commitment, risk, and dependence must be managed with the intercompany concepts of functional shifting (more on this point in Chapter 3), third-party providers, relationship management, and supply chain structures, to efficiently and effectively manage the six flows of any supply chain. Finally, efficiently means with minimal commitment of financial resources, and effectiveness means providing customer satisfaction and value, which (combined with efficiency) leads to profitability, which leads to competitive advantage.

From this perspective, the members of the University of Tennessee Supply Chain Research Group (Mentzer, 2000) drew a number of fundamental conclusions regarding how to accomplish SCM. Although the purpose of this book is to discuss the utilization of SCM to achieve competitive advantage, the conclusions from the authors contributing to Mentzer (2000) are summarized here to provide a foundation for all our subsequent discussion of SCM.

### **Fundamental Conclusions About SCM**

The members of the University of Tennessee Supply Chain Research Group (Mentzer, 2000) drew a number of managerial conclusions about SCM in 15 separate, but related, areas.

#### THE GLOBAL SUPPLY CHAIN MANAGEMENT ENVIRONMENT

Considering the globalization of the world economy, the diversity and environmental factors that influence a firm's global strategies and approach,

drivers influencing firms to become increasingly global, and the different approaches to globalization that might be adopted by firms, Nix (2000a) concluded:

- Different approaches to globalization require different degrees of supply chain integration, and different supply chain strategies and structure.
- Whatever approach to globalization and global supply chain management is adopted, firms face the challenges of understanding and managing the greater complexity and risks inherent in the global environment.
- Global supply chain strategies must be developed in support of the strategic
  thrust of a firm's globalization initiatives, and must consider opportunities for
  global efficiency, management of risks, learning to enable innovation and adaptation, and the need to balance global efficiency and local responsiveness.
- Global supply chain processes should provide operating flexibility to respond to changes in the macroeconomic environment or government policies that adversely affect supply chain performance.
- Design and management of supply chain activities must consider the influence
  of differences in culture, industry structure, legal requirements, and infrastructure in different countries on customers, suppliers, competitors, and supply
  chain partners.
- The management of financial systems in a global supply chain must address
  differences in financial accounting systems, comparability of data, management of terms of sale and ownership transfer to minimize risk and optimize
  profits, optimization of transfer pricing to minimize taxes, the minimization of
  foreign exchange risks, and the use of countertrade.
- A much broader set of skills is required of supply chain professionals to successfully manage on a global basis, including operating knowledge of the global environment, understanding how to manage inherent risks, and the ability to deal with differences in language and culture.
- Compatibility of information technologies and standardization of systems and data are critical to a firm's ability to integrate supply chain operations on a global basis.
- Decision support tools that incorporate global variables and allow "what if" scenario analysis are important to enable managers to more effectively manage the complexities and uncertainties of the global environment.

Managerial Conclusion: No matter which approach to globalization is pursued, firms are faced with the challenges of understanding and managing the complexities and risks inherent in the global environment. Global supply chain managers must develop capabilities that allow them to understand the complexities in the global environment, anticipate significant changes, and adapt to those changes as needed. Systems and processes must be designed to address important environmental variables, and organizational skills and capabilities must be developed to deal with different languages, cultures, and business environments.

#### **SCM OUTPUTS**

Considering the overall objectives of supply chain management of creating value for customers, and competitive advantage and improved profitability for supply chain firms, the dimensions of value that may be important to customers, and the mechanisms whereby competitive advantage and improved profitability can be achieved for supply chain members, Nix (2000b) concluded:

- The objective of SCM is to increase the competitive advantage of the supply chain as a whole, rather than to increase the advantage of any single
- The means to accomplish competitive advantage is through creating value for downstream customers greater than that offered by competitors.
- Customer value is created through collaboration and cooperation to improve efficiency (lower cost) or market effectiveness (added benefits) in ways that are most valuable to key customers.
- Value is not inherent in products or services, but rather is perceived or experienced by the customer.
- In order to compete through creating customer value, a firm must understand and deliver the value perceived as important by its customers.
- Since the value perceived as important will differ across customer segments, a firm must identify the customer segments important to its long-term success and match the capability of the firm to delivering the value important to those key customers.
- Value can be created at many points along the supply chain by making the customer firm at that point in the chain more effective in serving its markets, or more efficient and cost-effective in its operations.
- Delivering customer value in dimensions important to customers better than the competition leads to customer satisfaction and competitive advantage.
- By satisfying customers and achieving competitive advantage, firms in a supply chain influence customers to make choices and behave in ways that improve the financial performance of the supply chain and the firms within it.

Managerial Conclusion: The degree to which value is created for customers, and the customer's perception of the value received relative to that offered by the competition, are reflected in the customer's satisfaction with the offering. Customers who are satisfied with value created in areas important to them are expected to behave in ways that are beneficial to a firm's or a supply chain's success. Purchase behavior, customer loyalty, and positive communications about products and services result from customer satisfaction and, at the same time, contribute to a firm's or supply chain's success. In order to achieve these objectives, supply chain managers must work collaboratively with customers and suppliers to identify and deliver value considered important by critical downstream customers.

#### THE ROLE OF MARKETING IN SCM

Given the role of marketing in the implementation of supply chain management, suggested by a cause-and-effect relationship between the marketing concept, a market orientation, relationship marketing, and SCM, Min (2000a) concluded:

- The objective of marketing is creating exchanges, and the output of it is customer satisfaction.
- The marketing concept consists of three pillars: (1) customer focus, (2) coordinated marketing, and (3) profitability.
- The marketing concept is a business philosophy, guiding a firm toward customer satisfaction at a profit.
- A market orientation is the implementation of that philosophy, forcing the firm to generate, disseminate, and respond to market information.
- The marketing concept not only provides the philosophical foundation of a market orientation, but also plays an important role in the management of a firm, interfunctional relationships, and the implementation of SCM.
- A market orientation also affects the management of a firm, interfirm relationships, and a supply chain. That is, a market orientation leads a firm to focus on market information generation, dissemination, and responsiveness to satisfy customers, coordinate its marketing efforts, redefine the responsibilities of each function, restructure its organizational system, and achieve superior business performance. At the same time, a market orientation provides an environment that encourages a firm in its efforts to develop, maintain, and enhance close relationships with other firms, organizational learning from other firms, and building commitment, trust, and cooperative norms in the relationships with other firms.
- A market orientation is performed both inside and outside a firm to recognize
  and respond to customers' needs, and obtain experiences, products, skills, technologies, and knowledge from outside the firm that are not available to other
  competitors.
- A market orientation promotes the implementation of SCM.
- Relationship marketing aims at establishing, maintaining, and enhancing either dyadic relationships or multiple relationships in a supply chain to create better customer value.
- Relationship marketing helps achieve such objectives of SCM as efficiency (i.e., cost reduction) and effectiveness (i.e., customer service) through increased cooperation in close long-term interfirm relationships among the supply chain partners.
- With the help of the marketing concept, a market orientation, and relationship marketing, SCM achieves competitive advantage for the supply chain and its partners by reducing costs and investments, and improving customer service.

Managerial Conclusion: The role of marketing through the marketing concept, a market orientation, and relationship marketing is essential for the success of supply chain management.

#### THE ROLE OF SALES IN SCM

Given that the role of the contemporary salesperson is changing dramatically, and that in many situations, the old models of selling are simply outdated, ineffective, and counterproductive to supply chain management goals and objectives, Garver and Min (2000) concluded:

- While most sales organizations focus on prepurchase activities, supply chain partners focus on managing relationships and conducting postpurchase activities to enhance supply chain performance.
- The sales force is well positioned to implement, facilitate, and coordinate many supply chain management activities.
- In short, the supply chain sales force should be involved with any supply chain activity that goes beyond organizational boundaries.
- More specifically, the sales force should be an integral part of implementing cooperative behaviors (i.e., joint planning, evaluating, and forecasting), mutually sharing information, and nurturing supply chain relationships.
- To be effective at their new role, the supply chain sales force must gain new expertise in logistics and supply chain management. Salesperson logistics expertise is defined as a customer's perception of a salesperson's knowledge, experience, or skills relevant to logistics issues. Salesperson logistics expertise concerns the seller's and supply chain partners' logistics operations, systems, and processes at both tactical and strategic levels. Thus, salesperson logistics expertise includes internal (company) logistics expertise, external (supply chain partner) logistics expertise, tactical logistics expertise, and strategic logistics expertise.
- While the logistics manager may be the primary person designing logistics solutions, the salesperson is likely to be the primary person representing the supply chain partner's needs and requirements.
- For effective teamwork and innovative solutions, salespeople and logistics managers need to be able to communicate effectively and work together on supply chain management issues.

Managerial Conclusion: To support the sales force in their new supply chain management roles, sales managers need to train, support, and encourage supply chain activities and logistics expertise. To achieve this goal, sales managers must also adopt a new orientation and embrace new management techniques to enhance supply chain performance. Specifically, sales managers must become change agents in the sales organization and lead the sales force in a new direction. Traditional training programs, performance objectives, and compensation packages need to be adapted and better aligned with supply chain management.

#### THE ROLE OF RESEARCH AND DEVELOPMENT IN SCM

Considering the role of research and development (R&D) within the firm, and with suppliers, customers, and the supply chain, Zacharia (2000a) concluded:

- Supply chain activities have a major impact on the capabilities and profitability
  of the supply chain and its member firms in new product development.
- Innovative and effective new-product development is important in the turbulent, highly uncertain business environment of the future.
- By collaborating with immediate customers and suppliers, R&D can significantly improve the new-product development process.
- By collaborating with customers' customers and suppliers' suppliers along the supply chain, R&D improves the new-product development process.
- Companies that are multinational in scope can benefit through globalization
  of the R&D process and collaborating with global supply chain partners.
- The concept of postponement, delaying final product configuration as close to the end consumer as possible, benefits greatly from collaborating R&D with supply chain partners.
- Speed to market or reducing the cycle time to develop new products can be improved significantly through supply chain R&D involvement.
- Flexible new-product development enables companies to incorporate rapidly changing customer requirements and evolving technologies through supply chain R&D involvement.

Managerial Conclusion: Broadening the knowledge base involved in a firm's R&D process better enables managers to design and develop effective and efficient new-product development systems. This suggests that developing a supply chain orientation for R&D leads to opportunities for lower costs, improved customer value, and competitive advantages for the long term.

#### THE ROLE OF FORECASTING IN SCM

Given the increasingly important contribution to supply chain performance offered through effective sales forecasting management, Smith (2000) concluded:

- Supply chain sales forecasting management can significantly influence operating performance within each member, and across members, of a supply chain.
- To affect supply chain operations in a positive manner, organizations working together in a supply chain must improve forecasting management performance (an internally directed measure) as well as supply chain forecasting management performance (a cross-company measure).
- The four dimensions of sales forecasting management—functional integration, approach, systems, and performance measurement—can be extended to incorporate a supply chain orientation.
- Initiatives such as Collaborative Planning, Forecasting, and Replenishment (CPFR) reflect the four forecasting management dimensions and provide an approach to forecasting that addresses factors that influence forecasting management performance and supply chain forecasting management performance.

Managerial Conclusion: In order to contribute to improved supply chain performance, supply chain managers must go beyond traditional measures of

forecast accuracy to understand the overall supply chain demand-planning process and influence the behaviors of individuals and organizations involved in the development and application of sales forecasts.

#### THE ROLE OF PRODUCTION IN SCM

Considering the role of production within the firm, with suppliers, customers, and the supply chain, Zacharia (2000b) concluded:

- Functional products in stable markets need a supply chain production system that focuses on reducing volume cost and increasing production efficiency.
- Highly innovative products in uncertain, constantly changing environments need a supply chain production system that focuses on strategic flexibility and speed to market.
- Dispersed production is a supply chain production system of great value in a globally competitive market that focuses on cost efficiency.
- Build to order production and postponement are useful supply chain production systems in markets with quickly obsolete existing products, rapidly changing customer requirements, and shrinking product life cycles.

Managerial Conclusion: Understanding the different types of production systems better enables managers to design and develop the production system that is most suitable for the specific supply chain market environment.

#### THE ROLE OF PURCHASING IN SCM

Given the evolution of the role of purchasing and the purchasing role in support of a firm's SCM strategies and objectives, as well as the objectives and role of purchasing in a supply chain management context versus historical approaches, Nix (2000c) concluded:

- Purchasing plays a critical, boundary-spanning role in the supply chain management activities of a firm.
- In order to achieve the potential benefits of SCM, the role of purchasing must be viewed in a systemwide context, and must be focused beyond managing the buyer-seller relationship.
- Managers must understand the potential benefits to be achieved through SCM relationships, based on environmental conditions and specific resource or performance requirements.
- It is important for managers to understand the potential benefits, as well as the costs, of developing such relationships so that appropriate business decisions can be made.
- In order to be successful in achieving SCM objectives, purchasing requirements must be understood within the context of the overall strategy of the firm,

- supply chain partners must be selected to meet the strategic requirements, and the relationships must be managed appropriately over the long term.
- Cost and quality improvements must be understood and implemented from a systemwide perspective to achieve optimum results.
- To achieve the objectives of improved quality and reliability, reduced inventories, and lower total system cost associated with an operational approach to SCM, an emphasis on the integration of purchasing and logistics is required.
- To achieve the objectives of speed, flexibility, and competitive advantage associated with a strategic approach to SCM, collaboration with strategic supply chain partners focused on redesigning products and business processes to deliver value to customers is required.
- In a strategic context, the role of purchasing is to understand the capability of suppliers and identify ways to match that capability to the needs of strategic customers.
- Purchasing can enhance the effectiveness of product and process design by ensuring reliability and quality of supply of materials, components and services, managing supplier involvement in the process, and providing insights about the competitive supply environment.
- Organizational structure and communications processes must be designed to support the requirements and objectives of the purchasing organization in support of the firm's supply chain management activities.
- Information technology is critical to manage the increasing complexity of the
  purchasing function, facilitate the integration of processes across firms in a
  supply chain context, and provide decision support tools to enable systemwide
  optimization.

*Managerial Conclusion:* To date, researchers and managers alike have primarily focused on supplier partnerships, or building stronger relationships between the buyer and seller firm. In order to achieve the potential of SCM, managers and researchers alike must adopt a broader, systemwide approach to understand and achieve the contribution that purchasing can make in a SCM context.

#### THE ROLE OF LOGISTICS IN SCM

Considering the role of logistics in the supply chain, including the major functions comprising logistics, emerging logistics strategies, and logistics competencies that drive competitive advantage for the firm, Min and Keebler (2000) concluded:

- Logistics activities have a major impact on the capabilities and profitability of the supply chain and its member firms.
- Logistics functions are key operating components of an organization that require design and management consistent with corporate strategy and changing competitive environments.
- Logistics strategies need to be implemented that support corporate strategies and that are based on the needs of the marketplace and the distinct capabilities of the firm.

Corporate leaders who can understand and shape logistics competencies can dramatically enhance firm competitiveness.

Managerial Conclusion: Capitalizing on these opportunities requires the ability to build alliances within and between firms, a commitment to planning and integrating information flows, and the ability to measure performance to guide the improved design of the logistics system and supply chain processes. The importance of the supply chain manager's ability to leverage logistics competencies will increase in the future.

#### THE ROLE OF INFORMATION SYSTEMS IN SCM

Given the role of information systems within the firm and the role of information systems with suppliers, customers, and the supply chain, Zacharia (2000c) concluded:

- As the business environment continues to emphasize more variety and quicker response to a dynamic customer driven marketplace, better and more effective information systems need to be developed.
- One of the best ways to serve a demanding marketplace is to develop effective intrafirm information systems.
- Intrafirm information systems such as enterprise resource planning systems are an important precursor to improve the flow of information between firms.
- Managers need to determine if the benefits of effective and efficient information flow mitigate the risks associated with developing partnerships with either suppliers or customers.
- By developing relationships with members of their supply chains, firms can develop more efficient and effective information systems that facilitate better supply chain integration utilizing the enabling capabilities of the Internet.
- In the future, the Internet will allow true supply chain management through the transparent, real-time connection of all supply chain links.

Managerial Conclusion: Managers have little choice but to embark on the path to develop supply chain enhancing and integrating information systems. This augments the competitiveness of firms in terms of lower costs, improved customer value, and maintaining long-term competitive advantages in the rapidly changing, customer driven, Internet-enabled, e-commerce business environment.

#### THE ROLE OF FINANCE IN SCM

Considering the financial implications of supply chain decisions, trends in supply chain costs, a financial model for evaluating investments, and concerns for financial and supply chain management, Keebler (2000a) concluded:

- Supply chain activities affect profit and loss statements, balance sheets, and the costs of capital.
- Significant opportunities exist for the competent supply chain manager to reduce expenses, generate better returns on invested capital, and improve cash flows.
- By controlling supply chain expenses, profit margins are improved.
- By continuing to shorten cycle times, cash flows are enhanced.
- Superior supply chain performance can also produce the leverage and competitive advantage to increase revenues and the supply chain's share of market.
- Traditional accounting techniques do not provide accurate and timely information that informs the financial aspects of supply chain trade-off decisions.
- · Activity-based costing is not widely employed.
- The potential benefits of improved supply chain management are stymied by the absence of activity-based financial data and the inability to link performance measurement with cost.
- Improved collaboration between finance and other business and supply chain functions is necessary to facilitate the process to develop Activity Based Costing.
- This collaboration should help to overcome the seemingly widespread inability
  of supply chain managers to articulate the costs and benefits of supply chain
  activities.

Managerial Conclusion: Capitalizing on these opportunities requires the ability to plan for and measure supply chain performance and to effectively communicate performance implications in financial terms. The supply chain manager's ability to articulate the financial implications of exchanges between firms will continue to increase in importance.

#### THE ROLE OF CUSTOMER SERVICE IN SCM

Considering the elements of customer service management important to supply chain management, performance outcomes associated with customer service activities and their contribution to supply chain objectives, and customer responses to the outcomes of a firm's customer service activities, Nix (2000d) concluded:

- To achieve supply chain objectives, customer service activities must be strategic
  in nature and must be designed based on an understanding of the service levels
  important to critical customers.
- Important customer segments must be identified and the requirements of those segments understood for both immediate and downstream customers.
- The impact of service levels on customers should be understood and internal capabilities designed to deliver service levels that optimize the overall performance of the supply chain.
- The quality of the customer interface is likely to influence the level of trust and openness of information exchange between firms, which can contribute to a better understanding of the customer's needs and improved performance of supply chain management activities.

- It is important to measure customer service outcomes as perceived by the customer and understand which performance outcomes are most valued by customers at various levels of the supply chain.
- Customer service requirements and performance, as well as the influence of customer service levels on customer behavior, should be understood and monitored for both immediate and downstream customers in a supply
- Customer service is not the ultimate objective of supply chain management but rather an outcome of supply chain management that can create value for customers through improved efficiency or effectiveness.
- Creating value for customers superior to that created by competition is expected to result in greater customer satisfaction and competitive advantage and influence customers to behave in ways that improve the performance of the supply chain as a whole.

Managerial Conclusion: Customer service is often cited as a key objective of supply chain management. However, only if service offerings create value for customers will they lead to behaviors that improve supply chain performance. To achieve this objective, it is important for supply chain managers to manage customer service strategically and develop supply chain capabilities to deliver services viewed as important by critical downstream customers.

#### INTERFUNCTIONAL COORDINATION IN SCM

Highlighting the importance of interfunctional coordination within individual supply chain members to successfully implement supply chain management, Min (2000b) concluded:

- Concurrent management in supply chain management requires a balance between specialization through division of labor and cross-functional coordination.
- Interfunctional coordination within a particular firm is the coordinated efforts across functions to accomplish common goals, such as creating customer value and responsiveness to market changes, under close relationships among the functions and tight management control.
- The various ways of implementing interfunctional coordination include
  - Cooperative arrangements through which personnel from different functional areas perform interaction and collaboration
  - Managerial control, especially integrating managers who are essentially liaison personnel with formal authority over something important across functions (such as budgets)
  - o Standardization to guide the processes of coordination so that the coordinated work is ensured
  - o Functional expertise necessary for participation in cooperative arrangements
  - Organizational structure that integrates the flows of products, services, finance, and information within an organization

- No organization can rely on a single mechanism or organizational structure and, as a result, organizations must be flexible to utilize a proper combination of these mechanisms to achieve a high level of coordination.
- Common goals, trust and commitment among personnel from different functional areas, and top management support are the factors that promote cooperative efforts within a firm.
- Well-executed, interfunctional coordination brings competitive advantage, in terms of reduced cycle time, new-product success, and finally profitability.

*Managerial Conclusion:* Individual firms within a supply chain need expertise in key functional areas and, at the same time, must achieve functional integration as a precursor to supply chain management.

#### INTERCORPORATE COORDINATION IN SCM

Considering the importance of interfirm cooperation in supply chain management, and suggesting a model of interfirm cooperation from drivers, to prerequisites, to the outcomes of successful cooperative relationships in a supply chain context, Min (2000c) concluded:

- The demand for flexibility in today's turbulent business environment requires supply chain management, rather than the vertical integration or arm's length relationships of the past.
- Supply chain management (SCM) extends the concept of functional integration beyond a firm to all the firms in the supply chain and, therefore, the members of a supply chain need to help each other to improve the competitiveness of the supply chain.
- Implementing SCM inherently requires cooperation, which is defined as a set
  of joint actions of firms in a close relationship to accomplish a common set of
  goals that bring mutual benefits.

*Managerial Conclusion:* The supply chain manager's ability to build, maintain, and enhance cooperative interfirm relationships is essential for supply chain management.

#### PERFORMANCE MEASUREMENT IN SCM

Given the role of performance measurement in the supply chain, Keebler (2000b) concluded:

- Supply chain activities are not adequately defined, measured, or improved.
- Supply chain measurement research is largely single-firm focused.
- Research has emphasized internal efficiency over external effectiveness.
- There is an absence of multifirm performance measurement, or measures across the supply chain.

- Interdependent planning and governance structures do not appear to exist across firms.
- Supply chain members still appear to act largely as independent supply chain members, focused on self-interest.
- Vertical conflicts exist within supply chains that could be resolved with joint planning and measurement.
- Activity Based Costing, a critical performance measurement capability, is not widely employed.
- Potential benefits of improved supply chain management are stymied by the absence of activity-based financial data and the inability to link performance measurement with cost.

Managerial Conclusion: Capitalizing on the opportunities to plan and measure key supply chain processes improves both single-firm performance and supply chain outcomes. Supply chain performance measurement is in its infancy but will increase in importance.

From the foundation of these managerial conclusions, we can begin to discuss SCM as a source of competitive advantage. Our first example illustrates how this all-encompassing approach to a "systemic, strategic orientation" can lead to competitive advantage, especially when we realize that the final consumer can be considered one of the "three or more companies (entities) directly linked by the supply chain flows."

## Company A—Consumer **Supply Chain Competitive Advantage**

Company A is a major manufacturer of snack foods that sells through many outlets, the most prominent of which are the many stores of a mass merchandiser we will call Retailer B. Retailer B represents a major percentage of sales for Company A and clearly is an important customer. One of the drivers we will discuss later is "Not all customers are created equal," and Company A certainly recognized Retailer B as key to their success. Thus, Company A wanted to look for ways to compete and create value for Retailer B.

Company A realized that Retailer B was driven by the same two values that drive many retailers: traffic and vendor float. Traffic is the means by which retailers get their customers, the final consumer, into their store. Many retailers recognize that a significant percentage of their sales are unplanned purchases (i.e., the customer came in the store to buy certain things, but also impulse bought other items). One clothing retailer we have worked with estimates that 60% of their sales are unplanned purchases! So anything that helps the retailer get more customers walking through their stores is a value to the retailer. Later in this book, we will examine how another company (Company R) used

this retailer value to gain market share (that is, to help the retailer increase traffic), but this option did not seem feasible to Company A—after all, how many people shop in a particular retail store just for the snack food? Snack food brands are usually carried in a multitude of retail chains, and few people go to a mass merchandise store just to buy snack food. In fact, snack foods are often the products that are impulse bought after the customer is in the store.

So Company A decided to concentrate on improving the vendor float of Retailer B. Vendor float is a retail calculation of the effectiveness of their working capital, where

Working Capital = Inventory + Accounts Receivable.

More specifically, vendor float is the percentage of working capital that is paid for by the vendors:

Vendor Float = Accounts Payable/Working Capital.

For instance, if Retailer B has 25 days inventory on hand, 35 days accounts receivables (AR), and has to pay vendors in 30 days (accounts payable, or AP), then

Vendor Float = 
$$30/(25 + 35) = 50\%$$
.

This means vendors are financing 50% of Retailer B's working capital.

If Retailer B could push their vendors to accept 45 day payment terms, reduce inventory by 5 days, and get customers to pay 10 days sooner, then Retailer B's vendor float would be 100%, which means Retailer B would have none of its own money invested in its own working capital—the vendors are financing it (vendors do not have to be paid until the money is received from Retailer B's customers).

Company A would be foolish to simply offer to allow Retailer B more time to pay Company A, since this would hurt their own vendor float, but other supply chain options must be available. This is precisely what Company A sought—a SCM solution to provide more value (in the form of better vendor float) to Retailer B that did not hurt their own financial viability.

Company A originally considered the basic premise for competing for share of final consumers' business to be solely their products. Product design, a quality product, advertising, and promotion create brand equity. However, the strength of their brands is not much different from the strength of any other snack food manufacturer. Market share does not shift very much in this particular supply chain. So Company A approached the problem by not asking the question, "How do we compete based on the product?" but instead, "How

do we innovate the services we offer, not to the final customer, but to the retailer?"

What they developed was a forecasting and demand planning process to manage the supply chain flows we discussed earlier: the flow of the product, the flow of services, the flow of information, the flow of financial resources, and the flow of demand and forecasts. What they discovered was an interesting fact about many supply chains: the average time between a customer buying a Company A product in Retailer B and Company A finding out about it was 23 days! In this world of electronic data interchange (EDI), how could this be so? In fact, Company A and Retailer B were both proud of the EDI interface between the two companies—when Retailer B placed an order with Company A, it was instantaneously received by Company A.

To answer this question, let's look at how traditional, logistics-oriented inventory management systems work. When the customer in Retailer B buys one of Company A's products, what immediately happens in a traditional logistics system? The answer is—nothing. That is, nothing happens until inventory decreases enough to hit the reorder point (ROP). When the ROP is hit, the store automatically orders its order quantity to replenish inventory from its Retailer B regional distribution center (RDC). When the RDC finally hits its ROP, it looks for excess inventory at any of Retailer B's other RDCs (this is done to keep inventory from sitting too long in any one RDC and thus hurting shelf life freshness). Eventually, all the RDCs have inventory levels low enough that Retailer B finally sends an order to Company A, and yes, that order is instantaneously electronically transmitted and received. However, on average, it has been 23 days since the customer bought the Company A product in the store.

This traditional system affects shelf life of the product, average days of inventory that Retailer B carries in its stores and RDCs, inventory levels Company A carries to meet the sudden large order it eventually receives from Retailer B, and Company A production costs to meet this "lumpy" demand (i.e., sudden large orders from a major retailer, with no demand from this retailer in between the large orders). All of these are supply chain costs that could be reduced through supply chain management.

After examining all these flows, Company A devised an offer for Retailer B that could not be refused. Company A told the retailer, "First of all, we're better at forecasting demand for our products in your stores than you are. Give us real-time, point-of-sale (POS) demand data—which includes sales of the product, promotions, merchandising activities, co-op ads, and so forth—and we'll forecast individual demand. We're so certain we can do this well, we'll offer to directly manage the inventory of each of our stock keeping units (SKUs) in each of your stores (a concept today called VMI, or vendor-managed inventory). We're so sure we can do this well, if we stock out of any of our products

in any of your stores, we'll pay you a per day stock out penalty. Further, we are so sure we can do this well, we won't ask you to pay for any inventory of our product until it sells in your store."

Now, the benefits of the offer to Retailer B were obvious. As one supply chain executive in Retailer B put it, "You're offering to put us in the consignment business." Retailer B now has the ability to sell Company A products in all their stores and have no investment in inventory. All the inventory in their regional distribution centers and in their stores belongs to Company A, up to the instant when it sells. When it is rung up on the cash register, and the customer is taking it away, Retailer B now owes the purchase price of that product to Company A.

This creates some interesting changes in typical financial measures. What's the return on working capital for Retailer B on their Company A business? The answer is that the inventory component of working capital just dropped to zero. In our earlier example, vendor float for Retailer B is

Vendor Float  $_{\text{Retailer B}} = 30 \text{ days AP/}(0 \text{ days inventory} + 35 \text{ days AR}) = 85.7\%$ .

This is an incredibly high vendor float, made possible because no Retailer B dollars are invested in the inventory component of Retailer B's working capital of Company A products. This creates a motivation for Retailer B to sell more of this product, to give it better merchandising, better shelf location, and better store placement because the more of this product Retailer B sells, the more money Retailer B is making on a zero investment in inventory.

The supply chain management system that was put in place allows Company A to monitor sales of each of their products real time in each Retailer B store. So rather than Retailer B selling the product until it hits a reorder point, then ordering from the regional distribution center, then ordering from the corporate headquarters, and eventually ordering from Company A, Company A can, first, forecast the independent demand (that is, individual customers walking into the store and buying the product—a concept we will discuss further in Chapter 7), and then plan the derived demand, back through the RDCs, and eventually back to the distribution centers and production facilities at Company A.

The demand information cycle in this case has been taken from 23 days to 0 days. The effect on Retailer B was, again, obvious. They now have the same sales or higher sales of Company A products, and they have no money invested in inventory. They do not have to forecast or manage Company A products. Any orders that come into the Company A distribution centers, or the Retailer B RDCs, look like Retailer B orders. They look like they came off the Retailer B computer but, in fact, they were initiated by Company A, either to order from Company A and ship to the RDCs, or for the RDCs to ship to individual stores. The inventory is entirely managed by the vendor.

The effect for Company A is equally profound, but a little less obvious. Because they took those 23 days out of the information cycle (which means they have continuous demand information, real time, rather than the old, lumpy, occasional demand information), their inventory levels through the entire system actually went down, even though now they own the inventory in the Retailer B RDCs and retail stores. Because the demand affecting Company A is no longer lumpy and unexpected, production costs also significantly decreased.

We have left one piece out of this story, by the way. Once Retailer B was excited about this idea of having zero inventory in working capital, Company A put one last piece to the puzzle on the table: "If we're going to manage your inventory for you and we're not going to ask you to pay for it until the instant it sells, then we want you to instantly pay us."

"Wait a minute," said the Retailer B CFO. "We have a standard policy that says all of our sales are 2/10, net 30, which means that we'll pay you in 30 days, or if we pay you in 10 days we'll take a 2% discount."

Company A's answer was, "Unless you agree to this final part of the deal, then we cannot make money and the deal is off." Visions of zero investment in inventory with Company A were suddenly flying out the window for Retailer B.

"Okay," reluctantly they said, "we'll agree to it."

Well, let's look at what we have now done to the flows in the supply chain. We have already talked about Retailer B. We talked about the fact that Company A's inventory went down. But what happened to all the flows under the old system? Company A had to carry enough inventory in their own distribution centers to anticipate potential orders coming in, on average, 23 days in the future from Retailer B. Once they received that order, the product had to be moved to Retailer B and eventually would be distributed to various stores. When it hit the Retailer B system, Retailer B then issued a process that would pay Company A in 30 days. The 23-day inventory Company A carried, plus 30 days accounts receivable, add up to Company A working capital invested in Retailer B of 53 days. Working capital, remember, is accounts receivable plus all inventory. What happened when we took the 23 days out? Now, of course, the whole 23 days of inventory did not go away for Company A because there is uncertainty, but under the new system of better, more timely information, Company A now only carries 15 days of inventory. More important, when the order actually happens, they get paid 30 days earlier. So their working capital, systemwide to support Retailer B, went from 23 plus 30, or 53 days, down to 15 days. Their total investment in working capital to support Retailer B sales dropped by more than two thirds!

This example illustrates managing the supply chain flows and having profound effects on the bottom line profitability of not just one company, but several companies in the supply chain. Company A now sells more products

Table 1.1 T	welve Drivers of SCM	Competitive Advantage
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Chapter	Driver Number	Driver	
Two	One	Coordinate the traditional business functions across the company and across the supply chain.	
Three	Two	Collaborate with supply chain partners on noncore competency functions.	
Four	Three	Look for supply chain synergies.	
Five	Four	Not all customers are created equal.	
Six	Five	Identify and manage the supply chain flow cycles.	
Seven	Six	Manage demand (not just the forecast) in the supply chain.	
Eight	Seven	Substitute information for assets.	
Nine	Eight	Systems are templates to be laid over processes.	
Ten	Nine	Not all products are created equal.	
Eleven	Ten	Make yourself easy to do business with.	
Twelve	Eleven	Do not let tactics overshadow strategies.	
Thirteen	Twelve	Align your supply chain strategies and your reward structures.	

through the Retailer B supply chain, at considerably greater margins for both. This, of course, leads to a greater willingness on the part of Retailer B to work closely with Company A, which is an ongoing source of competitive advantage for Company A.

### **Twelve Drivers of SCM Competitive Advantage**

The Company A example tells us that competitive advantage can be obtained not just through the products sold, but also through the way in which we manage the flows in a supply chain. In fact, our work with many companies like Company A has led to what we call the "Twelve Drivers of SCM Competitive Advantage." Each of these drivers (illustrated in Table 1.1) is briefly presented here, and each is discussed in greater detail (with real examples) in the following chapters.

#### COORDINATE THE TRADITIONAL BUSINESS FUNCTIONS

Much of supply chain management involves coordinating the various business functions listed in Figure 1.1. Functional shifting is a term commonly

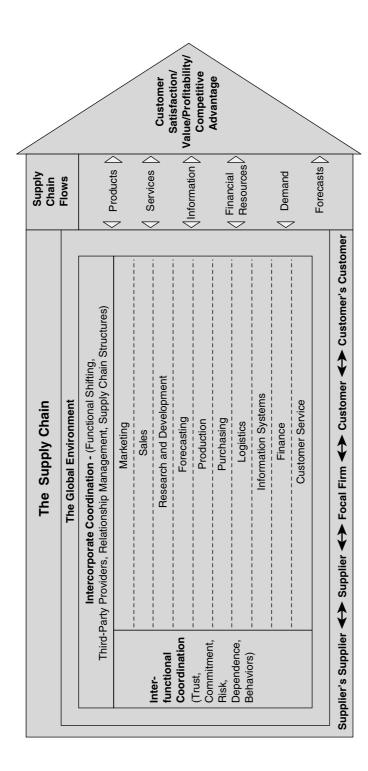


Figure 1.1 A Model of Supply Chain Management

Adapted from Mentzer (2000)

used to refer to two or more companies in a supply chain deciding who best performs a certain function and allowing them to perform this function for the supply chain as a whole.

However, it is a fundamental concept of supply chain management that you cannot coordinate business functions across companies within the supply chain if you cannot do this coordination first within your own company. There is a reason we present this driver first—the remaining 11 SCM Drivers of Competitive Advantage will come to little if this first one cannot be accomplished.

## COLLABORATE WITH SUPPLY CHAIN PARTNERS ON NONCORE COMPETENCY FUNCTIONS

How companies identify and manage their core competencies, and outsource noncore competencies, is the focus of this SCM Driver of Competitive Advantage. We will examine how companies identify core competencies and noncore competencies and decide on which ones to outsource to (and cooperate with as), supply chain partners.

#### LOOK FOR SUPPLY CHAIN SYNERGIES

SCM Drivers One and Two, respectively, encourage companies to coordinate the traditional business functions within the company and across supply chain partners, while keeping core competencies under internal control and outsourcing noncore competencies. The result of these two drivers is that synergistic effects (the whole is greater than the sum of the parts) can result. However, these synergies seldom happen unless they are actively sought, identified, and managed.

#### NOT ALL CUSTOMERS ARE CREATED EQUAL

To achieve competitive advantage, companies must realize that not all customers are created equal—some are critical to our success, some are less important and should be treated as such, and some are distracting us from serving the first two groups and should not be served at all. To understand these segments of customers, companies first need to answer several questions about their supply chains:

- Who is our customer?
- How do we reach our customer?
- How do we reach competitive advantage with our customer? (Hint: It is not always the product.)

As the first question indicates, identifying the relevant customer is the first step. Once we identify who the customer is, we must identify what the customer values, choose the customer values that we will emphasize, provide that value to the customer, communicate to the customer the fact that we are providing that value, and finally (and continuously) assess the customer's satisfaction with the value we are delivering.

#### IDENTIFY AND MANAGE THE SUPPLY CHAIN FLOW CYCLES

There are numerous flows in supply chain management. Products and services flow from suppliers through manufacturers through distributors through retailers to final customers. Services that accompany product flows in supply chains also flow both ways. Information about product/service availability, inventory location, transportation options, customer values, finances—in fact, information about any aspect of supply chain management—flows up and down the supply chain. Although financial flows are ultimately up the supply chain from the final customer to all supply chain participants, the timing of those flows (as Company A illustrated) is a critical aspect of supply chain management. Finally, demand for products and services flows up the supply chain, and the ability to forecast, anticipate, and plan for those demand flows has a huge impact on the viability of the supply chain.

#### MANAGE DEMAND (NOT JUST THE FORECAST) IN THE SUPPLY CHAIN

Little attention has been paid to the role of sales forecasting and demand management in the supply chain, or how that role might change depending upon the position in the supply chain that a company occupies. From a SCM perspective, the question arises, "Do all members of the supply chain need to forecast demand?" In fact, taking a SCM perspective reveals that any supply chain has only one point of independent demand—or the amount of product demanded (by time and location) by the end-use customer of the supply chain. Whether this end-use customer is a consumer shopping in a retail establishment or online (B2C), or a business buying products for consumption in the process of conducting their business operations (B2B), these end-use customers determine the true demand for the product that will flow through the supply chain.

The company in the supply chain that directly serves this end-use customer directly experiences this independent demand. All subsequent companies in the supply chain experience a demand that is tempered by the order fulfillment and purchasing policies of other companies in the supply chain. This second type of supply chain demand is called *derived demand*, because it

is not the independent demand of the end-use customer but rather a demand that is derived from what other companies in the supply chain do to meet their demand from their immediate customer (i.e., the company that orders from them). It is important to note that only one company in any given supply chain is affected by independent demand. The rest are affected by derived demand. Equally important, the techniques, systems, and processes necessary to deal with derived demand are quite different from those of independent demand. In fact, many companies develop elaborate sales forecasting techniques, systems, and processes when, in fact, they do not even need to forecast!

Recognizing the differences between independent and derived demand, recognizing which type of demand affects a particular company, and developing techniques, systems, and processes to deal with that company's particular type of demand can have a profound impact on supply chain costs and customer service levels.

#### SUBSTITUTE INFORMATION FOR ASSETS

Information technology is changing at an incredible rate of speed. The cost of obtaining that information is also becoming cheaper and cheaper. At the same time, the costs of assets to run a supply chain are not decreasing rapidly. The cost of inventory, plants, equipment, people, and storage facilities, to name a few, is not becoming cheaper. Thus, the key to SCM Driver Seven is how we use increasingly available and inexpensive information and information technology to eliminate other, more expensive supply chain assets.

#### SYSTEMS ARE TEMPLATES TO BE LAID OVER PROCESSES

It is easy to become enamored with the technology implied in Chapter 8, and companies often do. They become convinced that supply chain management is solely an information systems problem. However, no system or computer package exists today that can overcome poorly thought out processes. Processes are the procedures, rules, steps, and personnel involved in accomplishing any task or tasks. Systems are the computer and communications devices, equipment, and software brought to bear to augment accomplishment of those processes. Thus, systems are templates to be laid over processes.

#### NOT ALL PRODUCTS ARE CREATED EQUAL

Not all products contribute equally to the profitability of a company or a supply chain. In fact, many supply chains keep in stock a multitude of products that should be discontinued for lack of sales. As one supply executive put it, "We are great at introducing new products, but terrible at killing off loser

products." SCM Driver Nine is about understanding when we put too much attention into products that do not make money for the company or the supply chain.

#### MAKE YOURSELF EASY TO DO BUSINESS WITH

Companies that are able to create value for their customers by satisfying their needs and wants generally increase their market share and their profitability. Thus, an important part of any business, and certainly of any supply chain, is making it easy for customers to do business with us.

#### DO NOT LET TACTICS OVERSHADOW STRATEGIES

Letting attention to short-term tactics overshadow the accomplishment of long-term strategies can hurt the profitability and competitive viability of a company or a supply chain as a whole. Setting and meeting quarterly goals is no more important than setting and meeting the long-term goals of the supply chain. These long-term goals include the types of relationships to have with various supply chain partners to achieve profitability and competitive advantage.

#### ARE YOUR SUPPLY CHAIN STRATEGIES AND YOUR REWARD STRUCTURES ALIGNED?

There is a basic principle of organizational behavior (Mentzer & Bienstock, 1998a): "What gets measured gets rewarded, and what gets rewarded gets done." But what happens when we pay our people to do the wrong things? The key to this SCM Driver is to reward (and, thus, motivate) company employees and supply chain partners to act in ways consistent with our supply chain management strategies.

## Summary

From the foundations of what has been written before, and our experience with numerous companies, 12 Supply Chain Management Drivers of Competitive Advantage emerge. In each of the following chapters, we will address one of these SCM Drivers, illustrating its strategic impact by bringing to bear what others have said before and examples of real companies that have succeeded or failed by heeding or ignoring that driver. The purpose in each case is to stimulate the reader to think about how that particular driver can be applied in his or her company and supply chains.