Chapter One

Purchasing and Supply Management

Chapter Outline

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References

Cases
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Key Questions for the Supply Decision Maker

Should we

- Rethink how supply can contribute more effectively to organizational goals and strategies?
- Try to find out what the organization's total spend with suppliers really is?
- Identify opportunities for meaningful involvement in major corporate activities?

How can we

- Align our supply strategy with the organization's strategy?
- Get others to recognize the profit-leverage effect of purchasing/supply management?
- Show how supply can affect our firm's competitive position?

Every organization needs suppliers. No organization can exist without suppliers. Therefore, the organization's approach to suppliers, its acquisition processes and policies, and its relationships with suppliers will impact not only the performance of the suppliers, but also the organization's own performance. No organization can be successful without the support of its supplier base, operationally and strategically, short- and long-term.

Supply management is focused on the acquisition process recognizing the supply chain and organizational contexts. Special emphasis is on decision making that aligns the supplier network and the acquisition process with organizational goals and strategies and ensures short- and long-term value for funds spent.

There is no one best way of organizing the supply function, conducting its activities, and integrating suppliers effectively. This is both interesting and challenging. It is interesting because the acquisition of organizational requirements covers a very wide and complex set of approaches with different needs and different suppliers. It is challenging because of the complexity and because the process is dynamic, not static. Moreover, some of the brightest minds in this world have been hired as marketing and sales experts to persuade supply managers to choose their companies as suppliers. It is also challenging because every supply decision depends on a large variety of factors, the combination of which may well be unique to a particular organization.

For more than 80 years, this text and its predecessors have presented the supply function and suppliers as critical to an organization's success, competitive advantage, and customer satisfaction. Whereas in the 1930s this was a novel idea, over the past few decades there has been growing interest at the executive level in the supply chain management and its impact on strategic goals and objectives.

To increase long-term shareholder value, the company must increase revenue, decrease costs, or both. Supply's contribution should not be perceived as only focused on cost. Supply can and should also be concerned with revenue enhancement. What can supply and suppliers do to help the organization increase revenues or decrease costs? should be a standard question for any supply manager.

The supply function continues to evolve as technology and the worldwide competitive environment require innovative approaches. The traditionally held view that multiple sourcing increases supply security has been challenged by a trend toward single sourcing. Results from closer supplier relations and cooperation with suppliers question the wisdom of the traditional arm's-length dealings between purchaser and supplier. Negotiation is receiving increasing emphasis as opposed to competitive bidding, and longer-term contracts are replacing short-term buying techniques. E-commerce tools permit faster and lower-cost solutions, not only on the transaction side of supply but also in management decision support. Organizations are continually evaluating the risks and opportunities of global sourcing. All of these trends are a logical outcome of increased managerial concern with value and increasing procurement aggressiveness in developing suppliers to meet specific supply objectives of quality, quantity, delivery, price, service, and continuous improvement.

Effective purchasing and supply management contributes significantly to organizational success. This text explores the nature of this contribution and the management requirements for effective and efficient performance. The acquisition of materials, services, and equipment—of the right qualities, in the right quantities, at the right prices, at the right time, with the right quality, and on a continuing basis—long has occupied the attention of managers in both the public and private sectors.

Today, the emphasis is on the total supply management process in the context of organizational goals and management of supply chains. The rapidly changing supply scene, with cycles of abundance and shortages, varying prices, lead times, and availability, provides a continuing challenge to those organizations wishing to obtain a maximum contribution from this area. Furthermore, environmental, security, and financial regulatory requirements have added considerable complexity to the task of ensuring that supply and suppliers provide competitive advantage.

PURCHASING AND SUPPLY MANAGEMENT

Although some people may view interest in the performance of the supply function as a recent phenomenon, it was recognized as an independent and important function by many of the nation's railroad organizations well before 1900.

Yet, traditionally, most firms regarded the supply function primarily as a clerical activity. However, during World War I and World War II, the success of a firm was not dependent on what it could sell, since the market was almost unlimited. Instead, the ability to obtain from suppliers the raw materials, supplies, and services needed to keep the factories and mines operating was the key determinant of organizational success. Consequently, attention was given to the organization, policies, and procedures of the supply function, and it emerged as a recognized managerial activity.

During the 1950s and 1960s, supply management continued to gain stature as the number of people trained and competent to make sound supply decisions increased. Many companies elevated the chief purchasing officer to top management status, with titles such as vice president of purchasing, director of materials, or vice president of purchasing and supply.

As the decade of the 1970s opened, organizations faced two vexing problems: an international shortage of almost all the basic raw materials needed to support operations

and a rate of price increase far above the norm since the end of World War II. The Middle East oil embargo during the summer of 1973 intensified both the shortages and the price escalation. These developments put the spotlight directly on supply, for their performance in obtaining needed items from suppliers at realistic prices spelled the difference between success and failure. This emphasized again the crucial role played by supply and suppliers.

As the decade of the 1990s unfolded, it became clear that organizations must have an efficient and effective supply function if they were to compete successfully in the global marketplace. The early 21st century has brought new challenges in the areas of sustainability, supply chain security, and risk management.

In large supply organizations, supply professionals often are divided into two categories: the tacticians who handle day-to-day requirements and the strategic thinkers who possess strong analytical and planning skills and are involved in activities such as strategic sourcing. The extent to which the structure, processes, and people in a specific organization will match these trends varies from organization to organization, and from industry to industry.

The future will see a gradual shift from predominantly defensive strategies, resulting from the need to change in order to remain competitive, to aggressive strategies, in which firms take an imaginative approach to achieving supply objectives to satisfy short-term and long-term organizational goals. The focus on strategy now includes an emphasis on process and knowledge management. This text discusses what organizations should do today to remain competitive as well as what strategic purchasing and supply management will focus on tomorrow.

Growing management interest through necessity and improved insight into the opportunities in the supply area has resulted in a variety of organizational concepts. Terms such as *purchasing, procurement, materiel, materials management, logistics, sourcing, supply management,* and *supply chain management* are used almost interchangeably. No agreement exists on the definition of each of these terms, and managers in public and private institutions may have identical responsibilities but substantially different titles. The following definitions may be helpful in sorting out the more common understanding of the various terms.

Supply Management Terminology

Some academics and practitioners limit the term *purchasing* to the process of buying: learning of the need, locating and selecting a supplier, negotiating price and other pertinent terms, and following up to ensure delivery and payment. This is not the perspective taken in this text. *Purchasing, supply management,* and *procurement* are used interchangeably to refer to the integration of related functions to provide effective and efficient materials and services to the organization. Thus, purchasing or supply management is not only concerned with the standard steps in the procurement process: (1) the recognition of need, (2) the translation of that need into a commercially equivalent description, (3) the search for potential suppliers, (4) the selection of a suitable source, (5) the agreement on order or contract details, (6) the delivery of the products or services, and (7) the payment of suppliers.

Further responsibilities of supply may include receiving, inspection, warehousing, inventory control, materials handling, packaging scheduling, in- and outbound transportation/traffic, and disposal. Supply also may have responsibility for other components of the supply chain, such as the organization's customers and their customers and their suppliers' suppliers. This extension represents the term *supply chain management,* where the focus is

on minimizing costs and lead times across tiers in the supply chain to the benefit of the final customer. The idea that competition may change from the firm level to the supply chain level has been advanced as the next stage of competitive evolution.

In addition to the *operational responsibilities* that are part of the day-to-day activities of the supply organization, there are *strategic responsibilities*. *Strategic sourcing* focuses on long-term supplier relationships and commodity plans with the objectives of identifying opportunities in areas such as cost reductions, new technology advancements, and supply market trends. The Sabor case in Chapter 2 provides an excellent example of the need to take a strategic perspective when planning long-term supply needs.

Lean purchasing or *lean supply management* refers primarily to a manufacturing context and the implementation of just-in-time (JIT) tools and techniques to ensure every step in the supply process adds value, that inventories are kept at a minimum level, and that distances and delays between process steps are kept as short as possible. Instant communication of job status is essential and shared.

Supply and Logistics

The large number of physical moves associated with any purchasing or supply chain activity has focused attention on the role of logistics. According to the Council of Supply Chain Management Professionals, "Logistics management is that part of supply chain management 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."[1] This definition includes inbound, outbound, internal, and external movements. Logistics is not confined to manufacturing organizations. It is relevant to service organizations and to both private- and public-sector firms.

The attraction of the logistics concept is that it looks at the material flow process as a complete system, from initial need for materials to delivery of finished product or service to the customer. It attempts to provide the communication, coordination, and control needed to avoid the potential conflicts between the physical distribution and the materials management functions.

Supply influences a number of logistics-related activities, such as how much to buy and inbound transportation. With an increased emphasis on controlling material flow, the supply function must be concerned with decisions beyond supplier selection and price. The Qmont Mining case in Chapter 4 illustrates the logistics considerations of supplying multiple locations.

Organizations are examining business processes and exploring opportunities to integrate boundary-spanning activities in order to reduce costs and improve lead times. For example, Renault-Nissan announced in 2014 that it would integrate supply chain management activities, including purchasing and logistics, with manufacturing and R&D. The company had targeted €4.3 billion in annual savings from this initiative.[2]

[1] Council of Supply Chain Management Professionals, http://cscmp.org/about-us/supply-chain-management-definitions, accessed February 15, 2014.

[2] M. Williams, "Renault-Nissan Could integrate SCM Functions," *Automotive Logistics*, February 5, 2014, www.automotivelogisticsmagazine.com/news/renault-nissan-could-integrate-scm-functions, accessed February 15, 2014.

Supply chain management is a systems approach to managing the entire flow of information, materials, and services from raw materials suppliers through factories and warehouses to the end customer. The Institute for Supply Management (ISM) glossary defines *supply chain management* as "the design and management of seamless, value-added processes across organizational boundaries to meet the real needs of the end customer. The development and integration of people and technological resources are critical to successful supply chain integration."[3]

The term *value chain,* a term commonly used in the strategy literature, has been used to trace a product or service through its various moves and transformations, identifying the costs added at each successive stage.

Some academics and practitioners believe the term *chain* does not properly convey what really happens in a supply or value chain, and they prefer to use the term *supply network* or *supply web*.

The use of the concepts of purchasing, procurement, supply, and supply chain management will vary from organization to organization. It will depend on (1) their stage of development and/or sophistication, (2) the industry in which they operate, and (3) their competitive position.

The relative importance of the supply area compared to the other prime functions of the organization will be a major determinant of the management attention it will receive. How to assess the materials and services needs of a particular organization in context is one of the purposes of this book. More than 45 cases are provided to provide insight into a variety of situations and to give practice in resolving managerial problems.

THE SIZE OF THE ORGANIZATION'S SPEND AND FINANCIAL SIGNIFICANCE

The amount of money organizations spend with suppliers is staggering. Collectively, private and public organizations in North America spend about 1.5 times the GDPs of the United States, Canada, and Mexico combined, totaling at least $29 trillion U.S. dollars spent with suppliers.

Dollars spent with suppliers as a percentage of total revenues is a good indicator of supply's financial impact. Obviously, the percentage of revenue that is paid out to suppliers varies from industry to industry and organization to organization, and increased outsourcing over the last decade has increased the percentage of spend significantly. In almost all manufacturing organizations, the supply area represents by far the largest single category of spend, ranging from 50 to 80 percent of revenue. Wages, by comparison, typically amount to about 10 to 20 percent. In comparison, the total dollars spent on outside suppliers typically ranges from 25 to 35 percent of revenues. The Delphi Corporation case in Chapter 13 is a good illustration of the significance of spend in a manufacturing organization. Total purchases were $17 billion compared to revenues of $28 billion.

The financial impact of the corporate spend is often illustrated by the profit-leverage effect and the return-on-assets effect.

[3] Institute for Supply Management, "Glossary of Key Supply Management Terms," www.ism.ws.

Profit-Leverage Effect

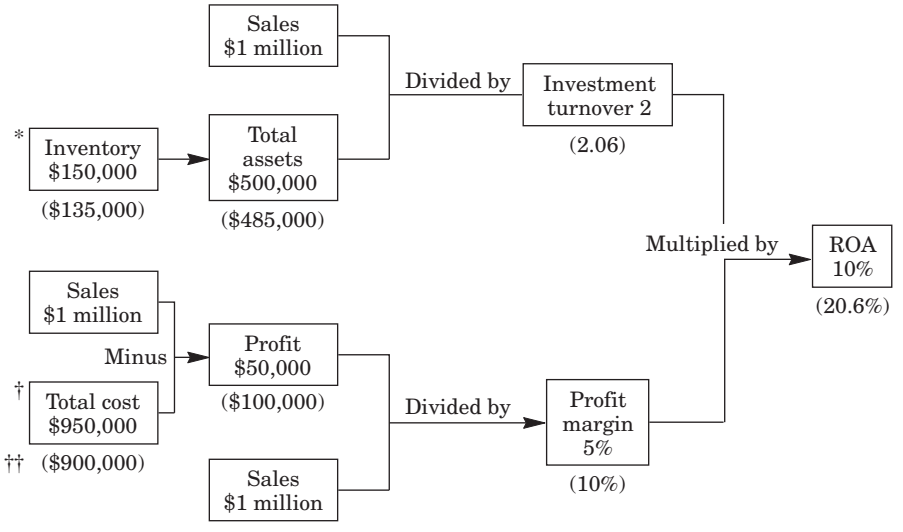
The profit-leverage effect of supply savings is measured by the increase in profit obtained by a decrease in purchase spend. For example, for an organization with revenue of $100 million, purchases of $60 million, and profit of $8 million before tax, a 10 percent reduction in purchase spend would result in an increase in profit of 75 percent. To achieve a $6,000,000 increase in profit by increasing sales, assuming the same percentage hold, might well require an increase of $75 million in sales, or 75 percent! Which of these two options—an increase in sales of 75 percent or a decrease in purchase spend of 10 percent—is more likely to be achieved?

This is not to suggest that it would be easy to reduce overall purchase costs by 10 percent. In a firm that has given major attention to the supply function over the years, it would be difficult, and perhaps impossible, to do. But, in a firm that has neglected supply, it would be a realistic objective. Because of the profit-leverage effect of supply, large savings are possible relative to the effort that would be needed to increase sales by the much-larger percentage necessary to generate the same effect on the profit and loss (P&L) statement. Since, in many firms, sales already has received much more attention, supply may be the last untapped "profit producer."

Return-on-Assets Effect

Financial experts are increasingly interested in return on assets (ROA) as a measure of corporate performance. Figure 1–1 shows the standard ROA model, using the same ratio of figures as in the previous example, and assuming that inventory accounts for 30 percent of total assets. If purchase costs were reduced by 10 percent, that would cause an extra benefit of a 10 percent reduction in the inventory asset base. The numbers in the boxes show the initial figures used in arriving at the 10 percent ROA performance.

FIGURE 1–1
Return-on-Assets Factors



*Inventory is approximately 30 percent of total assets.
†Purchases account for half of total sales, or $500,000.
††Figures in parentheses assume a 10 percent reduction in purchase costs.

The numbers below each box are the figures resulting from a 10 percent overall purchase price reduction, and the end product is a new ROA of 20.6 percent or about an 100 percent increase in return on assets.

Reduction in Inventory Investment

Charles Dehelly, senior executive vice president at Thomson Multimedia, headquartered in Paris, France, said: "It came as quite a surprise to some supply people that I expected them to worry about the balance sheet by insisting on measuring their return on capital employed performance."[4] Mr. Dehelly was pushing for reductions in inventory investment, not only by lowering purchase price, as shown in the example in Figure 1–1, but also by getting suppliers to take over inventory responsibility and ownership, thereby removing asset dollars in the ROA calculations, but also taking on the risk of obsolescence, inventory carrying, and disposal costs. Since accountants value inventory items at the purchaser at purchased cost, including transportation, but inventory at the supplier at manufacturing cost, the same items stored at the supplier typically have a lower inventory investment and carrying cost.

Thus, it is a prime responsibility of supply to manage the supply process with the lowest reasonable levels of inventory attainable. Inventory turnover and level are two major measures of supply chain performance.

Evidently, the financial impact of supply is on the balance sheet and the income statement, the two key indicators of corporate financial health used by managers, analysts, financial institutions, and investors. While the financial impact of the supply spend is obviously significant, it is by no means the only impact of supply on an organization's ability to compete and be successful.

SUPPLY CONTRIBUTION

Although supply's financial impact is major, supply contributes to organizational goals and strategies in a variety of other ways. The three major perspectives on supply are shown in Figure 1–2:

1. Operational versus strategic.
2. Direct and indirect.
3. Negative, neutral, and positive.

The Operational versus Strategic Contribution of Supply

First, supply can be viewed in two contexts: operational, which is characterized as *trouble avoidance,* and strategic, which is characterized as *opportunistic*.

The operational context is the most familiar. Many people inside the organization are inconvenienced to varying degrees when supply does not meet minimum expectations. Improper quality, wrong quantities, and late delivery may make life miserable for the ultimate user of the product or service. This is so basic and apparent that "no complaints" is assumed to be an indicator of good supply performance. The difficulty is that many users never expect anything more and hence may not receive anything more.

[4] M. R. Leenders and P. F. Johnson, *Major Changes in Supply Chain Responsibilities* (Tempe, AZ: CAPS Research, March 2002), p. 104.

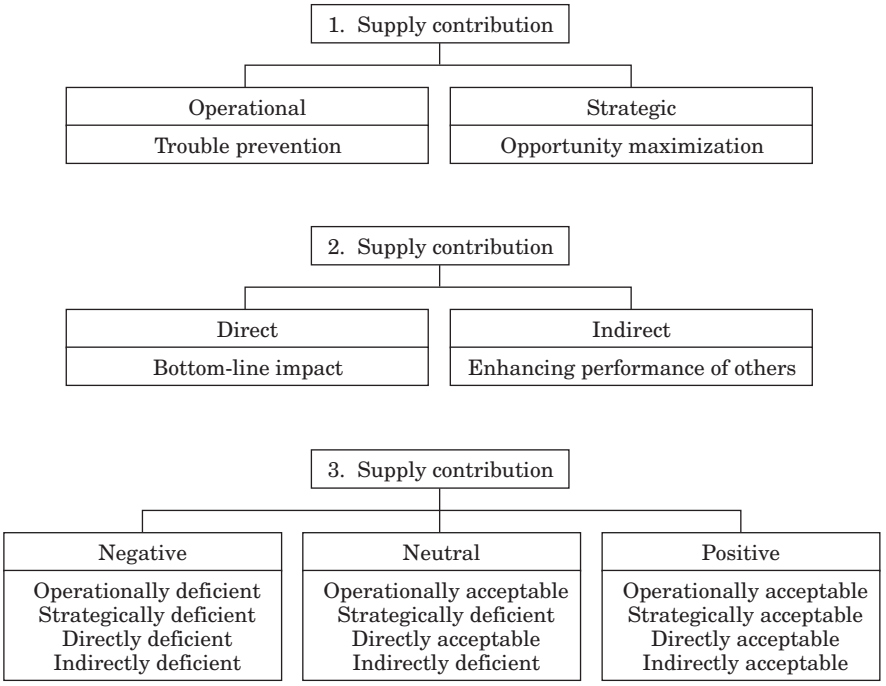


FIGURE 1–2
Purchasing's Operational and Strategic Contributions

Source: Michiel R. Leenders and Anna E. Flynn, *Value-Driven Purchasing: Managing the Key Steps in the Acquisition Process* (Burr Ridge, IL: Richard D. Irwin, 1995), p. 7.

The operational side of supply concerns itself with the transactional, day-to-day operations traditionally associated with purchasing. The operational side can be streamlined and organized in ways designed to routinize and automate many of the transactions, thus freeing up time for the supply manager to focus on the strategic contribution.

The strategic side of supply is future oriented and searches for opportunities to provide competitive advantage. Whereas on the operational side the focus is on executing current tasks as designed, the strategic side focuses on new and better solutions to organizational and supply challenges. (Chapter 2 discusses the strategic side in detail.)

The Direct and Indirect Contribution of Supply

The second perspective is that of supply's potential direct or indirect contribution to organizational objectives.

Supply savings, the profit-leverage effect, and the return-on-assets effect demonstrate the direct contribution supply can make to the company's financial statements. Although the argument that supply savings flow directly to the bottom line appears self-evident, experience shows that savings do not always get that far. Budget heads, when presented with savings, may choose to spend this unexpected windfall on other requirements.

To combat this phenomenon, some supply organizations have hired financial controllers to assure that supply savings do reach the bottom line. Such was the case at Praxair, a global supplier of specialty gases and technologies. The chief supply officer and the CFO agreed that a financial controller position was needed in the supply organization to support financial analysis and budgeting. Validating cost savings and linking cost savings to the business unit operating budgets were an important part of this person's responsibilities.[5]

[5] Leenders and Johnson, *Major Changes in Supply Chain Responsibilities*, p. 89.

The appeal of the direct contribution of supply is that both inventory reduction and purchasing savings are measurable and tangible evidence of supply contribution.

The supply function also contributes indirectly by enhancing the performance of other departments or individuals in the organization. This perspective puts supply on the management team of the organization. Just as in sports, the team's objective is to win. Who scores is less important than the total team's performance. For example, better quality may reduce rework, lower warranty costs, increase customer satisfaction, and/or increase the ability to sell more or at a higher price. Ideas from suppliers may result in improved design, lower manufacturing costs, and/or a faster idea-to-design-to-product-completion-to-customer-delivery cycle. Each would improve the organization's competitiveness.

Indirect contributions come from supply's role as an information source; its effect on efficiency, competitive position, risk, and company image; the management training provided by assignments in the supply area; and its role in developing management strategy and social policy. The benefits of the indirect contribution may outweigh the direct contribution, but measuring the indirect benefits is difficult since it involves many "soft" or intangible contributions that are difficult to quantify.

Information Source

The contacts of the supply function in the marketplace provide a useful source of information for various functions within the organization. Primary examples include information about prices, availability of goods, new sources of supply, new products, and new technology, all of interest to many other parts of the organization. New marketing techniques and distribution systems used by suppliers may be of interest to the marketing group. News about major investments, mergers, acquisition candidates, international political and economic developments, pending bankruptcies, major promotions and appointments, and current and potential customers may be relevant to marketing, finance, research, and top management. Supply's unique position vis-à-vis the marketplace should provide a comprehensive listening post.

Effect on Efficiency

The efficiency with which supply processes are performed will show up in other operating results. While the firm's accounting system may not be sophisticated enough to identify poor efficiency as having been caused by poor purchase decisions, that could be the case. If supply selects a supplier who fails to deliver raw materials or parts that measure up to the agreed-on quality standards, this may result in a higher scrap rate or costly rework, requiring excessive direct labor expenditures. If the supplier does not meet the agreed-on delivery schedule, this may require a costly rescheduling of production, decreasing overall production efficiency, or, in the worst case, a shutdown of the production line—and fixed costs continue even though there is no output. Many supply managers refer to user departments as internal customers or clients and focus on improving the efficiency and effectiveness of the function with a goal of providing outstanding internal customer service.

Effect on Competitive Position/Customer Satisfaction

A firm cannot be competitive unless it can deliver end products or services to its customers when they are wanted, of the quality desired, and at a price the customer feels is fair.

If supply doesn't do its job, the firm will not have the required materials or services when needed, of desired quality, and at a price that will keep end-product costs competitive and under control.

The ability of the supply organization to secure requirements of better quality, faster, at a better price than competitors, will not only improve the organization's competitive position, but also improve customer satisfaction. The same can be said for greater flexibility to adjust to customers' changing needs. Thus, a demonstrably better-performing supply organization is a major asset on any corporate team.

A major chemical producer was able to develop a significantly lower-cost option for a key raw material that proved to be environmentally superior as well as better quality. By selling its better end product at somewhat lower prices, the chemical producer was able to double its market share, significantly improving its financial health and competitive position as well as the satisfaction of its customers.

Effect on Organizational Risk

Risk management is becoming an ever-increasing concern. The supply function clearly impacts the organization in terms of operational, financial, and reputation risk. Supply disruptions in terms of energy, service, or direct or indirect requirements can impact the ability of the organization to operate as planned and as expected by its customers, creating operational risks.

Given that commodity and financial markets establish prices that may go up or down beyond the control of the individual purchaser, and that long-term supply agreements require price provisions, the supply area may represent a significant level of financial risk. Furthermore, unethical or questionable supply practices and suppliers may expose the organization to significant reputation risk.

Effect on Image

The actions of supply personnel influence directly the public relations and image of a company. If actual and potential suppliers are not treated in a businesslike manner, they will form a poor opinion of the entire organization and will communicate this to other firms. This poor image will adversely affect the purchaser's ability to get new business and to find new and better suppliers. Public confidence can be boosted by evidence of sound and ethical policies and fair implementation of them.

The large spend of any organization draws attention in terms of supplier chosen, the process used to choose suppliers, the ethics surrounding the supply process, and conformance to regulatory requirements. Are the suppliers chosen "clean" in terms of child labor, environmental behavior, and reputation? Is the acquisition process transparent and legally, ethically, strategically, and operationally defensible as sound practice? Do supply's actions take fully into account environmental, financial, and other regulatory requirements, such as national security?

Global brands have come under increased scrutiny for their sourcing policies, accused of turning a blind eye to the labor practices of their suppliers. The collapse of a Bangladeshi factory in April 2013, killing more than 1,100 people, focused worldwide attention on poor working conditions and low pay for workers manufacturing garments for companies that included Walmart, Benetton, and Loblaws. The disaster spurred a debate about the responsibility of large retailers to ensure that their supplier factories met acceptable safety

standards and paid their workers a living wage. There are an estimated 5,000 garment factories in Bangladesh, employing approximately 3.6 million workers, many of whom are paid the minimum wage of $38 a month.

Maintaining a proper corporate image is the responsibility of every team member and supply is no exception.

Training Ground

The supply area also is an excellent training ground for new managers. The needs of the organization may be quickly grasped. Exposure to the pressure of decision making under uncertainty with potentially serious consequences allows for evaluation of the individual's ability and willingness to make sound decisions and assume responsibility. Contacts with many people at various levels and a variety of functions may assist the individual in learning about how the organization works. Many organizations find it useful to include the supply area as part of a formal job rotation system for high-potential employees.

Examples of senior corporate executives with significant supply experience include Mary Barra, CEO of General Motors; Willie A. Deese, executive vice president, Merck & Co.; and Richard B. Jacobs, president of Eaton Corporation's Filtration Division.

Management Strategy

Supply also can be used as a tool of management strategy and social policy. Does management wish to introduce and stimulate competition? Does it favor geographical representation, minority interest, and environmental and social concerns? For example, are domestic sources preferred? Will resources be spent on assisting minority suppliers? As part of an overall organization strategy, the supply function can contribute a great deal. Assurance of supply of vital materials or services in a time of general shortages can be a major competitive advantage. Similarly, access to a better-quality or a lower-priced product or service may represent a substantial gain. These strategic positions in the marketplace may be gained through active exploration of international and domestic markets, technology, innovative management systems, and the imaginative use of corporate resources. Vertical integration and its companion decisions of make or buy (insource or outsource) are ever-present considerations in the management of supply.

The potential contribution of supply to strategy is obvious. Achievement depends on both top executive awareness of this potential and the ability to marshal corporate resources to this end. At the same time, it is the responsibility of those charged with the management of the supply function to seek strategic opportunities in the environment and to draw top executive attention to them. This requires a thorough familiarity with organizational objectives, strategy, and long-term plans and the ability to influence these in the light of new information. Chapter 2 discusses both potential supply contributions to business strategy *and* the major strategy areas within the supply function.

Progressive managers have recognized the potential contributions of the supply management area and have taken the necessary steps to ensure results. One important step in successful organizations has been the elevation to top executive status of the supply manager. Although titles are not always consistent with status and value in an organization, they still make a statement within and outside of most organizations. Currently, the most common title of the chief supply officer is vice president, followed by director and manager.

The elevation of the chief supply officer to executive status, coupled with high-caliber staff and the appropriate authority and responsibility, has resulted in an exciting and fruitful realization of the potential of the supply function in many companies. Chapter 3 discusses supply organizations issues in greater detail.

THE NATURE OF THE ORGANIZATION

The nature of the organization will determine how it will structure and manage its supply function. Whether the organization is public or private and produces goods or services or both, its mission, vision, and strategies, its size, number of sites, location, financial strength, and reputation will all be factors influencing its supply options and decisions. These will be addressed broadly in this first chapter and will be added to subsequently in this text.

Public or Private Organization

Public institutions, including all levels of government from municipal to state or provincial to federal, tend to be service providers but are not exclusively so and are subject to strict regulatory requirements regarding acquisition processes and policies. The public sector in many countries also includes education, health, utilities, and a host of agencies, boards, institutes, and so forth. The Wentworth Hospital case in Chapter 7 provides an example of supply in a public-sector context. This case illustrates how many purchases in the public sector can be for capital and indirect supplies, which creates challenges for supply to influence purchasing decisions that ensure best value.

A large segment of the acquisition needs of public institutions is concerned with the support of the organization's mission and maintenance of facilities and offices. Concerns over public spending deal with transparency and fairness of access to all eligible suppliers, social aims such as support of minority and disadvantaged groups, and national security. Need definition and specification are often part of the supply manager's responsibilities and are often geared to allow for multiple bidders.

That not all public organizations are alike is evident from Figure 1–3, which shows just some of the differences among public bodies.

Nongovernmental organizations (NGOs) and other nonprofit organizations would have a breakdown similar to those listed for public organizations, but might also operate internationally.

Private Organizations

Private organizations, which include companies with publicly traded stocks, tend to have fewer constraints on need definition, specification, and supplier selection. The laws of the

FIGURE 1–3
Differentiations for Supply Management in Public Organizations

Level:	Municipal ⟷	State or Provincial ⟷	Federal
Mission:	Social Aims ⟷	Other or Combination ⟷	Economic
Revenue Generation:	Limited ⟷	Combination ⟷	Substantial
Size:	Small ⟷	Medium ⟷	Large
Number of Sites:	Single ⟷	Few ⟷	Many

FIGURE 1–4 Differentiations for Supply Management in Private Organizations

Goods or Services:	Manufacturer ⟷	Combination ⟷	Services
Strategy:	Low cost ⟷	Combination ⟷	Differentiation
Size:	Small ⟷	Medium ⟷	Large
Number of Sites:	Single ⟷	Few ⟷	Many
Location:	Domestic ⟷	Few International ⟷	Many International
Financial Strength:	Weak ⟷	Medium ⟷	Strong
Reputation:	Poor ⟷	Medium ⟷	Outstanding

land (covered in Chapter 5) will establish the main ground rules for commerce. Transparency of commitments with suppliers has recently become more relevant to ensure that long-term commitments are properly disclosed in the company's financial statements. Whereas in public institutions standardization is seen as a means of fairness to suppliers, in private companies, custom specifications are seen as a means of securing competitive advantage.

Figure 1–4 shows some of the influencers that will affect supply management in private organizations. It is clear that for both public and private organizations these differences will affect supply significantly and some generalizations on supply impact follow.

Goods or Service Producers

Another major supply influence is whether the organization produces goods or services or both. Goods producers, often called manufacturers, may produce a wide range of products, both in the industrial goods category and in consumer goods. For goods producers, normally the largest percentage of total spend of the organization is on materials, purchased parts, packaging, and transportation for the goods produced. For service providers (and the range of possible services is huge), normally the largest percent of spend is focused on services and the process enabling the delivery of the services. The Erica Carson case in this chapter describes a supply decision in a large services organization, a financial institution. This case illustrates the opportunities for supply to contribute to the customer value proposition.

The following table identifies what the impact on organizational requirements is likely to be depending on whether the organization is primarily focused on manufacturing or providing a service:

Manufacturer	Service Provider
• The largest portion of needs is generated by customer needs. • The largest portion of spend with suppliers will be on direct requirements which comprise products sold to customers.	• The largest portion of needs is generated by capital, services, and other requirements enabling employees to provide the service. • In retailing the largest spend is focused on resale requirements.

Very few organizations are pure manufacturers or service providers. Most represent a mixture of both. A restaurant provides meals and drinks as well as service and a place to eat.

An insurance company provides insurance policies and claim service as well as peace of mind. An R&D organization performs research, as well as research reports, models, and prototypes. A manufacturer may supply capital goods as well as repair service and availability of replacement parts.

Wholesalers, distributors, and retailers provide resale products in smaller quantities and in more convenient locations at more convenient times than the manufacturers can provide. For these resellers the ability to buy well is critical for success.

Resource and mining organizations explore for natural resources and find ways and means of bringing these to commodity markets. Educational institutions attempt to transform students into educated persons, frequently providing them with meals, residences, classrooms, parking facilities, and, hopefully, diplomas or degrees. Health organizations provide diagnostic and repair services using a very large variety of professionals, equipment, facilities, medicines, and parts to keep their clients healthy and functioning.

It is no surprise that the nature of the organization in terms of the goods and services it provides will significantly affect the requirements of its supply chain.

The Mission, Vision, and Strategy of the Organization

Supply strategy has to be congruent with organizational strategy. Therefore, the mission, vision, and strategy of the organization are the key drivers for how the supply function will be managed and how supply decisions are made and executed. A nonprofit organization with social aims may acquire its office needs totally differently from one that competes on cost in a tough commercial or consumer marketplace. An innovation-focused organization may define flexibility quite differently from one that depends largely on the acquisition and transformation or distribution of commodities.

In the past, the supply manager was largely focused on the traditional value determinants of quality, quantity, delivery, price, and service as the five key drivers of sound supply decisions. Today's supply managers face a host of additional concerns, as corporate mission, vision, and strategies require concerns over risk, the environment, social responsibility, transparency, regulation, and innovation as well. Thus, the old adage of value for money, a guiding principle for supply managers for centuries, has become a lot tougher over the last few decades and continues to evolve. The text and cases in this book are focused on major supply decisions appropriate for the unique organization in which the supply professional is employed.

The Size of the Organization

The larger the organization, the greater the absolute amount of spend with suppliers. And the amount of the spend will be a major determinant of how many resources can be allocated to the acquisition process. Given a cost of acquisition of 1 to 2 percent of what is acquired, for a $100,000 purchase, up to $2,000 can be spent on acquisition. However, a $100 million acquisition can afford up to $2 million and a $1 billion spend up to $20 million.

Therefore, the larger the amount of spend, the greater the time and care that can and should be allocated to acquisition. Therefore, in very small organizations, the responsibility for acquisition may be a part-time allocation to one or more individuals who probably wear multiple hats. In very large organizations, supply professionals may be completely dedicated to one category of requirements on a full-time basis. And a supply group may count hundreds of professionals.

Single or Multiple Sites

An additional influence is whether the organization operates out of a single or multiple sites. The simplest situation is the single site. The supply situation becomes more complex as the number of sites increases. Transportation and storage issues multiply with multiple sites along with communication and control challenges. This is especially true for multinationals supplying multiple sites in different countries.

Financial Strength

Supply management stripped to its bare essentials deals with the exchange of money for goods and services. With the acquiring company responsible for the money and the supplier for the goods and services, the ability of the buying organization to pay will be a very important issue in the supplier's eyes. And the ability to pay and flexibility on when to pay depend on the financial strength of the organization. The stronger the buying organization is financially, the more attractive it becomes as a potential customer. A supplier will be more anxious to offer an exceptionally good value proposition to an attractive customer. And the ability and willingness to pay quickly after receipt of goods or services add valuable bargaining chips to any purchaser.

Reputation

Corporate reputation in the trade is another important factor in building a positive corporate image both for suppliers and purchasers. If supply management is defined as the fight for superior suppliers, then a strong corporate image and reputation are valuable contributors. Superior suppliers can pick and choose their customers. Superior suppliers prefer to deal with superior customers. Superior customers enhance a superior supplier's reputation. "You are known by the company you keep" applies in the corporate world just like it does in personal life. And supply managers can significantly affect their company's image by their actions and relations with suppliers.

For a long time the reputation of Fisher & Paykel (F&P) in New Zealand and Australia was such that any F&P supplier could use this as a persuasive argument for gaining additional customers in that area of the world. "If you are good enough to supply F&P, you are good enough for us" was the implication. A good buyer–supplier relationship is built on the rock of impeccable performance to contract agreements. Pay the right amount on time without hassle and deliver the right quality and quantity of goods or services on time and charge the correct price without hassle. These commitments are not as simple as they sound. Moreover, superior customers and superior suppliers add ethical treatment; advance communications on future developments in technology, markets, and opportunities for improvements as additional expectations; and are continually striving to do better.

Corporate reputations are built on actions and results, not on noble intentions. It takes time to build a superior reputation, but not much time to harm a reputation.

SUPPLY QUALIFICATIONS AND ASSOCIATIONS

In recognition that the talent in supply has to match the challenges of the profession, public and private organizations as well as supply associations have taken the initiative to ensure well-qualified supply professionals are available to staff the function.

Education

Although there are no universal educational requirements for entry-level supply jobs, most large organizations require a college degree in business administration or management. Several major educational institutions, such as Arizona State University, Bowling Green State University, George Washington University, Miami University, Michigan State University, and Western Michigan University, now offer an undergraduate degree major in Purchasing/Supply/Supply Chain/Logistics Management as part of the bachelor in business administration degree. In addition, many schools offer certificate programs or some courses in supply, for either full- or part-time students. A number of schools, including Arizona State, Michigan State, NYU Stern, and Howard University, also offer a specialization in supply chain management as part of a master of business administration degree program.

In Canada, the Ivey Business School has offered for over 60 years a purchasing and supply course as part of its undergraduate and graduate degree offerings. Other universities such as HEC, Laval, York, Queens, University of British Columbia, and Victoria have followed suit; academic interest in supply chain management is at an all-time high.

While, obviously, a university degree is not a guarantee of individual performance and success, the supply professional with one or more degrees is perceived on an educational par with professionals in other disciplines such as engineering, accounting, marketing, information technology (IT), human resources (HR), or finance. That perception is important in the role that supply professionals are invited to play on the organizational team.

Professional Associations

As any profession matures, its professional associations emerge as focal points for efforts to advance professional practice and conduct. In the United States, the major professional association is the Institute for Supply Management (ISM), founded in 1915 as the National Association of Purchasing Agents. The ISM is an educational and research association with over 40,000 members who belong to ISM through its network of domestic and international affiliated associations.

In addition to regional and national conferences, ISM sponsors seminars for supply people. It publishes a variety of books and monographs and the leading scholarly journal in the field, *The Journal of Supply Chain Management,* which it began in 1965. Additionally, ISM and its Canadian counterpart, the Supply Chain Management Association (SCMA), formally the Purchasing Management Association of Canada, work with colleges and universities to encourage and support the teaching of purchasing and supply management and related subjects and provide financial grants to support doctoral student research.

ISM launched the Certified Professional in Supply Management (CPSM) program in May 2008. The CPSM program focuses skill development in areas such as supplier relationship management, commodity management, risk and compliance issues, and social responsibility.

Since the early 1930s, ISM has conducted the monthly "ISM Report on Business," which is one of the best-recognized current barometers of business activity in the manufacturing sector. In 1998, the association initiated the Nonmanufacturing ISM Report on Business. The survey results are normally released on the second business day of each month. The Ivey Purchasing Managers Index (Ivey PMI), conducted by the Ivey Business School, is the Canadian equivalent of ISM's Report on Business, but covers the complete Canadian economy, including the manufacturing services and government sectors.

In 1986, CAPS Research (formally the Center for Advanced Purchasing Studies) was established as a national affiliation agreement between ISM and the College of Business at Arizona State University. CAPS is dedicated to the discovery and dissemination of strategic supply management knowledge and best practices. It conducts benchmarking studies, runs executive round tables and best practices workshops, and publishes research reports in a wide range of areas.

In Canada, the professional association is the Supply Chain Management Association (SCMA), formally the PMAC, formed in 1919. Its membership of approximately 8,000 is organized in 10 provincial and territorial institutes from coast to coast. Its primary objective is education, and in addition to sponsoring a national conference, it offers an accreditation program leading to the Supply Chain Management Professional (SCMP) designation.

In addition to ISM and SCMA, there are other professional purchasing associations, such as the National Institute of Governmental Purchasing (NIGP), the National Association of State Purchasing Officials (NASPO), the National Association of Educational Procurement (NAEP), and the Association for Healthcare Resource and Materials Management (AHPMM).

Several of these associations offer their own certification programs. Most industrialized countries have their own professional purchasing associations. CIPS (Chartered Institute of Purchasing and Supply) has affiliates in the United Kingdom, Australia, New Zealand, Africa, mainland China, and Hong Kong SAR. Other examples include the Indian Institute of Materials Management and the Japan Materials Management Association. These national associations are loosely organized into the International Federation of Purchasing and Supply Management (IFPSM), which has as its objective the fostering of cooperation, education, and research in purchasing on a worldwide basis among the 48 national and regional purchasing associations worldwide, representing approximately 250,000 supply professionals.

CHALLENGES AHEAD

There are at least six major challenges facing the supply profession over the next decade: supply chain management, measurement, risk management, sustainability, growth and influence, and effective contribution to corporate success.

Supply Chain Management

The success of firms like Walmart and Zara in exploiting supply chain opportunities has helped popularize the whole field of supply chain management. Nevertheless, significant challenges remain: While the giant firms in automotive, electronics, and retailing can force the various members of the supply chain to do their bidding, smaller companies do not have that luxury. Thus, each organization has to determine for itself how far it can extend its sphere of influence within the supply chain and how to respond to supply chain initiatives by others. Clearly, opportunities to reduce inventories, shorten lead times and distances, plan operations better, remove uncertainties, and squeeze waste out of the supply chain are still abundant. Thus, the search for extra value in the supply chain will continue for a considerable period of time.

Measurement

There is significant interest in better measurement of supply not only to provide senior management with better information regarding supply's contribution, but also to be able to assess the benefits of various supply experiments. No one set of measurements is likely to suffice for all supply organizations. Therefore, finding the set of measures most appropriate for a particular organization's circumstances is part of the measurement challenge.

Risk Management

A study at Michigan State University found that supply chain disruptions and supply chain risk are among the most critical issues facing supply chain managers.[6] Supply chains have become increasingly global and, therefore, face risks of supply interruptions, financial and exchange rate fluctuations, lead time variability, and security and protection of intellectual property rights, to name only a few. The trend to single sourcing and lean global supply chains has also created the increased risks for supply disruptions.

Supply managers need to continually assess risks in the supply chain and balance risk/reward opportunities when making supply decisions. For example, the attraction of lower prices from an offshore supplier may create longer-term high costs as a result of the need to carry additional safety stock inventories or lost sales from stock-outs. The Russel Wisselink case in Chapter 9 describes how one organization ran into problems in a low cost country sourcing program. Risk management will be covered in more detail in Chapter 2.

Sustainability

Responsibility for reverse logistics and disposal has traditionally fallen under the supply organization umbrella (see Chapters 16 and 17). These activities include the effective and efficient capture and disposition of downstream products from customers. More recently, however, pressures from government and consumer groups are motivating organizations to reduce the impact of their supply chains on the natural environment. For example, the European Union (EU) has set aggressive targets for greenhouse gas reductions and cuts to overall energy consumption, and has implemented new legislation as a result. Supply will be at the forefront of sustainability initiatives. Senior management will expect supply to work with suppliers to identify solutions for the environmental and sustainability challenges they face.

Growth and Influence

Growth and influence in terms of the role of supply and its responsibilities inside an organization can be represented in four areas as identified in a CAPS Research focus study.[7] In the first place, supply can grow in the percentage of the organization's total spend for which it is meaningfully involved. Thus, categories of spend traditionally not involving purchasing, such as real estate, insurance, energy, benefit programs, part-time help, relocation services, consulting, marketing spend with advertising and media agencies, travel and facilities management, IT, and telecommunications and logistics, have become part of procurement's responsibility in more progressive corporations.

[6] S. A. Melnyk et al., *Supply Chain Management 2010 and Beyond: Mapping the Future of the Strategic Supply Chain* (The Eli Broad College of Business at Michigan State University, 2006).

[7] Leenders and Johnson, *Major Changes in Supply Chain Responsibilities.*

Second, the growth of supply responsibilities can be seen in the span of supply chain activities under purchasing or supply leadership. Recent additions include accounts payable, legal, training and recruiting, programs and customer bid support, and involvement with new business development.

Third, growth can occur in the type of involvement of supply in what is acquired and supply chain responsibilities. Clearly, on the lowest level, there is no supply involvement at all. The next step up is a transactionary or documentary role. Next, professional involvement implies that supply personnel have the opportunity to exercise their expertise in important acquisition process stages. At the highest level, meaningful involvement, a term first coined by Dr. Ian Stuart, represents true team member status for supply at the executive table. Thus, in any major decision taken in the organization, the question *What are the supply implications of this decision?* is as natural and standard as *What are the financial implications of this decision?*

Fourth, supply can grow by its involvement in corporate activities from which it might have been previously excluded. While involvement in make-or-buy decisions, economic forecasts, countertrade, in- and outsourcing, and supplier conferences might be expected, other activities such as strategic planning, mergers and acquisitions, visionary task forces, and initial project planning might be good examples of broader corporate strategic integration.

Each of these four areas of opportunity for growth allows for supply to spread its wings and increase the value of its contributions.

Effective Contribution to Organizational Success

Ultimately, supply's measure of its contribution needs to be seen in the success of the organization as a whole. Contributing operationally and strategically, directly and indirectly, and in a positive mode, the challenge for supply is to be an effective team member. Meaningful involvement of supply can be demonstrated by the recognition accorded supply by all members of the organization.

How happy are other corporate team members to have supply on their team? Do they see supply's role as critical to the team's success? Thus, to gain not only senior management recognition but also the proper appreciation of peer managers in other functions is a continuing challenge for both supply professionals and academics.

THE ORGANIZATION OF THIS TEXT

In this first chapter are listed the more common influences for all organizations. In subsequent chapters, we will cover various decisions regarding organizational and supply strategies, organization supply processes, make or buy, the variety of organizational needs, and how to translate these into commercial equivalents. These will be followed by decisions on quality, quantity, delivery, price, and service—the traditional five value criteria—culminating in supplier selection. Suppliers are located domestically and internationally and their location will affect how supply should be managed. The legal and ethical framework for supply establishes the framework for the contract between these two parties. How to evaluate supplier performance and how to relate to suppliers is followed by a section on supply chain associated responsibilities which may or may not be part of the supply

manager's assignment. This text concludes with the evaluation of the supply function, its performance reporting, and current trends in the field.

Conclusion

If the chief executive officer and all members of the management team can say, "Because of the kinds of suppliers we have and the way we relate to them, we can outperform our competition and provide greater customer satisfaction," then the supply function is contributing to its full potential.

This is the ambitious goal of this text: to provide insights for those who wish to understand the supply function better, whether or not they are or will be employed in supply directly.

Questions for Review and Discussion

1. What is the profit-leverage effect of supply? Is it the same in all organizations?
2. "Supply is not profit making; instead, it is profit taking since it spends organizational resources." Do you agree?
3. What kinds of decisions does a typical supply manager make?
4. "In the long term, the success of any organization depends on its ability to create and maintain a customer." Do you agree? What does this have to do with purchasing and supply management?
5. Is purchasing a profession? If not, why not? If yes, how will the profession, and the people practicing it, change over the next decade?
6. Differentiate between purchasing, procurement, materials management, logistics, supply management, and supply chain management.
7. In what ways might e-commerce influence the role of supply managers in their own organizations? In managing supply chains or networks?
8. In the petroleum and coal products industry, the total purchase/sales ratio is 80 percent, while in the food industry it is about 60 percent. Explain what these numbers mean. Of what significance is this number for a supply manager in a company in each of these industries?
9. How does supply management affect return on assets (ROA)? In what specific ways could you improve ROA through supply management?
10. How can the expectations of supply differ for private versus public organizations? Services versus goods producers?

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Case 1–1

Denniston Spices

Amy Lin, materials planner at Denniston Spices, in Phoenix, Arizona, was faced with an important problem caused by a supplier who was implementing a new enterprise resource planning (ERP) system. It was Tuesday, April 9, 2014, and during a call the previous day from Juan Aranda, sales manager at Whittingham Foods, Amy learned that potential supply problems might occur starting in September as the new system was implemented at the Whittingham's Indianapolis plant. In order to avoid stockouts, Juan asked Amy to provide a forecast of her plant's needs for September to November by April 30th, so he could make arrangements to have product shipped to Denniston in late August.

DENNISTON SPICES

Founded in 1903 by Walter J. Denniston, Denniston Spices was a global leader in the food industry—manufacturing, marketing, and distributing a wide variety of spices, mixes, condiments, and other seasoning products to the retail, commercial, and industrial markets. Headquartered in Chicago, the company had sales revenues of $5.5 billion and sold its products in more than 100 countries worldwide. Its customers included retail outlets, food manufacturers, restaurant chains, food distributors, and food service businesses. Denniston Spices was also a leading supplier of private label items.

The Phoenix plant manufactured and distributed spices, herbs, extracts, and seasoning blends to retail and industrial customers in the southwest United States. Amy Lin was responsible for managing approximately 300 stock-keeping units (SKUs) consisting of spices and compounds, purchased from Whittingham Foods, which was the sole supplier for these products. All SKUs supplied to the Phoenix plant by Whittingham came from their Indianapolis facility.

INVENTORY CONTROL

It was company policy that each SKU had minimum safety stock inventory to protect against stockouts. Safety stock levels were set by the materials planners and typically ranged from two to four weeks. Reorder points were set at the safety stock level for each SKU plus four weeks, which reflected the lead time from Whittingham Foods for most products. Orders were constrained by minimum order quantities set by the supplier.

Forecasting and setting reasonable safety stock levels were made difficult because of variability in demand, particularly from industrial customers. Many of the Phoenix plant's industrial customers were small- and medium-sized manufacturers that ordered sporadically.

Prices for products supplied by Whittingham Foods ranged from $50 to $250 per pound, and had shelf-lives of either 90, 180, or 270 days. The major challenge in Amy's role was to balance high inventory costs and short shelf lives with the risks of stockout costs and inventory spoilage. Denniston Spices offered 10-day delivery lead times to its customers and it typically took 2 to 7 days for an order to be processed and shipped. The Phoenix plant had a customer service level target of 98 percent.

INVENTORY BUILD FOR AUGUST

The call from Juan Aranda did not come as a surprise to Amy, who had known for several weeks that Whittingham Foods was implementing a new ERP system and at some point she would need to purchase additional safety stock inventory. Whittingham Foods was as key supplier to several Denniston plants, and switching suppliers was not feasible for such a short period of time due to the costs and administrative issues related to government regulations regarding the certification of suppliers. While there was a possibility they would not experience any problems and supply would not be interrupted, Amy did not want to take any chances and had the full support of her boss, Kevin Sherman, the director of purchasing.

As a starting point, Amy collected demand data for eight SKUs during July to November period in 2012 and 2013 (see Exhibit 1). For each of the eight SKUs, she also collected information related to safety stock levels, minimum order quantities (MOQ), shelf life, and cost per pound. She purposely selected SKUs from different final products that included a range of costs and annual demand, with the objective of developing an inventory build policy for the SKUs ordered from Whittingham Foods. Amy knew that certain events in 2012 and 2013 distorted the data. For example, the company had expanded in 2013 through an acquisition and the plant increased production in order to build additional finished goods inventories as a result of a facility consolidation project in the fall of 2013.

As Amy looked at the data on her spreadsheet, she wondered if it would be possible to balance stockout risks with inventory holding and inventory spoilage costs. It was important that she develop a preliminary plan within the next week so she could get it approved by the director of purchasing and the general manager. Margins were tight and Amy knew that she had to do her best to develop a plan that controlled costs without jeopardizing customer service levels.

EXHIBIT 1 **Historical Usage for Whittingham Products**

		Monthly Demand (lb.)					Safety Stock (lb.)	MOQ (lb.)	Shelf Life (Days)	Cost ($/lb.)
SKU #	Year	July	Aug.	Sept.	Oct.	Nov.				
W9450	2012	51	208	80	75	103	1,000	200	90	$ 90
	2013	0	325	3,060	4,770	7,024				
W9451	2012	3,251	5,794	2,492	1,830	3,052	3,600	200	90	$ 195
	2013	956	2,854	2,730	2,621	3,786				
W9452	2012	979	680	460	894	778	600	200	180	$ 65
	2013	360	336	282	325	550				
W9453	2012	189	229	271	397	420	650	200	180	$ 110
	2013	549	642	1,019	1,655	2,588				
W9454	2012	52	56	54	45	50	100	200	270	$ 235
	2013	16	76	18	0	20				
W9455	2012	7	2	0	20	0	400	200	270	$ 65
	2013	724	304	304	376	424				
W9456	2012	120	4	55	1	60	15	80	270	$ 120
	2013	16	1	43	17	15				
W9457	2012	41	157	54	117	0	320	80	270	$ 120
	2013	0	131	82	69	0				

Case 1–2

Erica Carson

"We will do it for 10 percent less than what you are paying right now." Erica Carson, purchasing manager at Wesbank, a large western financial institution, had agreed to meet with Art Evans, a sales representative from D.Killoran Inc., a printing supplier from which Wesbank currently was not buying anything. Art Evans's impromptu and unsolicited price quote concerned the printing and mailing of checks from Wesbank.

Wesbank, well known for its active promotional efforts to attract consumer deposits, provided standard personalized consumer checks free of charge. Despite the increasing popularity of Internet banking, the printing of free checks and mailing to customers cost Wesbank $8 million in the past year.

Erica Carson was purchasing manager in charge of all printing for Wesbank and reported directly to the vice president of supply.

It had been Erica's decision to split the printing and mailing of checks equally between two suppliers. During the last five years, both suppliers had provided quick and quality service, a vital concern of the bank. Almost all checks were mailed directly to the consumer's home or business address by the suppliers. Because of the importance of check printing, Erica had requested a special cost analysis study a year ago, with the cooperation of both suppliers. The conclusion of this study had been that both suppliers were receiving an adequate profit margin and were efficient and cost-conscious and that the price structure was fair. Each supplier was on a two-year contract. One supplier's contract had been renewed eight months ago; the other's expired in another four months.

Erica believed that Killoran was underbidding to gain part of the check-printing business. This in turn would give Killoran access to Wesbank's customers' names. Erica suspected that Killoran might then try to pursue these customers more actively than the current two suppliers to sell special "scenic checks" that customers paid for themselves.

Chapter **Two**

Supply Strategy

Chapter Outline

Levels of Strategic Planning

Major Challenges in Setting Supply Objectives and Strategies

Strategic Planning in Supply Management

Risk Management

- *Operational Risk*
- *Financial Risk*
- *Reputational Risk*
- *Managing Supply Risk*
- *The Corporate Context*

Strategic Components

- *What?*
- *Quality?*
- *How Much?*
- *Who?*
- *When?*
- *What Price?*
- *Where?*
- *How?*
- *Why?*

Conclusion

Questions for Review and Discussion

References

Cases

- *2–1 Spartan Heat Exchangers Inc.*
- *2–2 Sabor Inc.*
- *2–3 Ford Motor Company: Aligned Business Framework*

Key Questions for the Supply Decision Maker

Should we

- Become more concerned about the balance sheet?
- Develop a strategic plan for purchasing and supply management?
- Spend a major part of our time on strategic, rather than operational, issues?

How can we

- Anticipate the professional changes we will face in the next 10 years?
- Ensure supply is included as part of the organization's overall strategy?
- Generate the information needed to do strategic planning?

In strategic supply, the key question is: How can supply and the supply chain contribute *effectively* to organizational objectives and strategy? The accompanying question is: How can the organizational objectives and strategy properly reflect the contribution and opportunities offered in the supply chain?

A *strategy* is an *action plan* designed to achieve specific *long-term goals and objectives*. The strategy should concentrate on the *key factors necessary* for success and the *major actions* that should be taken now *to ensure the future*. It is the process of determining the relationship of the organization to its *environment,* establishing long-term *objectives,* and achieving the desired relationship(s) through efficient and effective *allocation of resources.*

LEVELS OF STRATEGIC PLANNING

To be successful, an organization must approach strategic planning on three levels:

1. *Corporate*. These are the decisions and plans that answer the questions of What business are we in? and How will we allocate our resources among these businesses? For example, is a railroad in the business of running trains? Or is its business the movement (creating time and space utility) of things and people?
2. *Business Unit*. These decisions mold the plans of a particular business unit, as necessary, to contribute to the corporate strategy.
3. *Function*. These plans concern the how of each functional area's contribution to the business strategy and involve the allocation of internal resources.

Several studies have reinforced the notion that linking supply strategy to corporate strategy is essential, but many firms do not yet have mechanisms in place to link the two.[1]

[1] R. M. Monczka and K. J. Petersen, *Supply Strategy Implementation: Current State and Future Opportunities* (Tempe, AZ: CAPS Research, 2008). S. D. Hunt and D. Davis, "Grounding Supply Chain Management in Resource-Advantage Theory: In Defense of a Resource-Based View of the Firm," *Journal of Supply Chain Management* 48, no. 2 (2012), pp. 14–20.

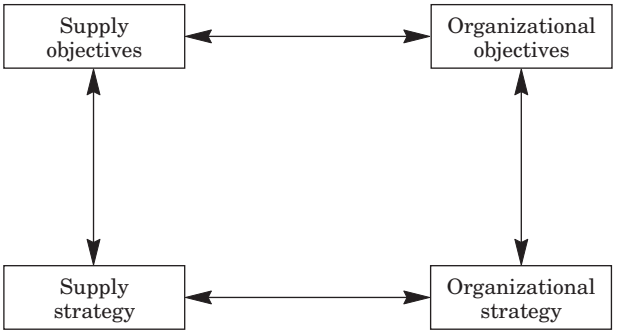

FIGURE 2–1
Supply Strategy Congruent with Organizational Strategy

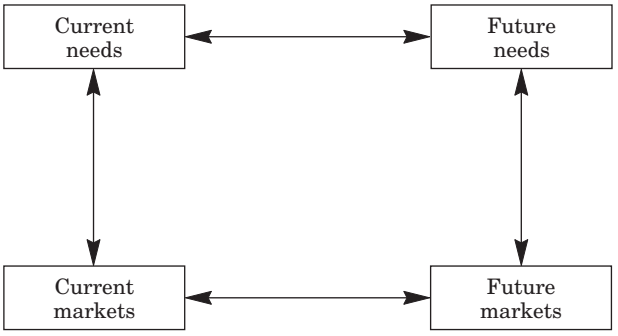

FIGURE 2–2
Supply Strategy Links Current and Future Markets to Current and Future Needs

Effective contribution connotes more than just a response to a directive from top management. It also implies inputs to the strategic planning process so that organizational objectives and strategies include supply opportunities and problems.

This is graphically shown in Figure 2–1 by the use of double arrows between supply objectives and strategy and organizational objectives and strategy.

A different look at supply strategy is given in Figure 2–2. This shows an effective supply strategy linking both current needs and current markets to future needs and future markets.

One of the significant obstacles to the development of an effective supply strategy lies in the difficulties inherent in translating organizational objectives into supply objectives. For example, Tony Brown, senior vice president of global sourcing at Ford Motor Company, was implementing a new supply strategy that he believed would improve performance in the areas of quality, technology, delivery, cost, and speed to market. However, the company chairman and CEO William Clay Ford Jr. will be interested in issues such as how the new supply strategy will improve earnings per share and create shareholder value. (See the Ford Motor Company case at the end of the chapter.)

Normally, most organizational objectives can be summarized under four categories: survival, growth, financial, and environmental. Survival is the most basic need of any organization. Growth can be expressed in a variety of ways. For example, growth could be in size of the organization in terms of number of employees or assets or number of operating units, or number of countries in which the organization operates, or in market share.

Financial objectives could include total size of budget, surplus or profit, total revenue, return on investment, return on assets, share price, earnings per share, or increases in each of these or any combination. Environmental objectives include not only traditional environmental concerns like clean air, water, and earth but also objectives such as the contribution to and fit with values and ideals of the organization's employees and customers, and the laws and aspirations of the countries in which the organization operates. The notion of good citizenship is embodied in this fourth objective.

Unfortunately, typical supply objectives normally are expressed in a totally different language, such as quality and function, delivery, quantity, price, terms and conditions, service, and so on.

MAJOR CHALLENGES IN SETTING SUPPLY OBJECTIVES AND STRATEGIES

The first major challenge facing the supply manager is the effective interpretation of corporate objectives and supply objectives. For example, given the organization's desire to expand rapidly, is supply assurance more important than obtaining "rock bottom" prices?

The second challenge deals with the choice of the appropriate action plan or strategy to achieve the desired objectives. For example, if supply assurance is vital, is it best accomplished by single or dual sourcing, or by making in-house?

The third challenge deals with the identification and feedback of supply issues to be integrated into organizational objectives and strategies. For example, because a new technology can be accessed early through supply efforts, how can this be exploited? The Spartan Heat Exchangers case at the end of this chapter provides an illustration of how supply should be integrated to corporate strategy. The changes in corporate strategy and objectives at Spartan necessitate changes in supply strategy.

The development of a supply strategy requires that the supply manager be in tune with the organization's key objectives and strategies and also be capable of recognizing and grasping opportunities. All three challenges require managerial and strategic skills of the highest order, and the difficulties in meeting these challenges should not be minimized.

STRATEGIC PLANNING IN SUPPLY MANAGEMENT

Today, firms face the challenge of prospering in the face of highly competitive world markets. The ability to relate effectively to outside environments—social, economic, political, legal, and technological—to anticipate changes, to adjust to changes, and to capitalize on opportunities by formulating and executing strategic plans is a major factor in generating future earnings and is critical to survival. Supply must be forward looking.

A supply strategy is a supply action plan designed to permit the achievement of selected goals and objectives. If well developed, the strategy will link the firm to the environment as part of the long-term planning process. An overall supply strategy is made up of substrategies that can be grouped together into six major categories:

1. *Assurance-of-supply strategies.* Designed to ensure that future supply needs are met with emphasis on quality and quantity. Assurance-of-supply strategies must consider

changes in both demand and supply. (Much of the work in purchasing research [see Chapter 17] is focused on providing the relevant information.)

2. *Cost-reduction strategies.* Designed to reduce the laid-down cost of what is acquired or the total cost of acquisition and use—life-cycle cost. With changes in the environment and technology, alternatives may be available to reduce an organization's overall operating costs through changes in materials, sources, methods, and buyer–supplier relationships.
3. *Supply chain support strategies.* Designed to maximize the likelihood that the considerable knowledge and capabilities of supply chain members are available to the buying organization. For example, better communication systems are needed between buyers and sellers to facilitate the timely notification of changes and to ensure that supply inventories and production goals are consistent with the needs. Supply chain members also need better relations for the communication needed to ensure higher quality and better design.
4. *Environmental-change strategies.* Designed to anticipate and recognize shifts in the total environment (economic, organizational, people, legal, governmental regulations and controls, and systems availability) so that it can turn them to the long-term advantage of the buying organization.
5. *Competitive-edge strategies.* Designed to exploit market opportunities and organizational strengths to give the buying organization a significant competitive edge. In the public sector, the term *competitive edge* usually may be interpreted to mean strong performance in achieving program objectives.
6. *Risk-management strategies.* Whereas the various aspects of the previous five types of strategies have been covered earlier in this text, the issue of risk management has not yet been discussed. Therefore, this section will be expanded here, not to imply greater importance, but to assure adequate coverage.

RISK MANAGEMENT

Every business decision involves risk, and supply is no exception. In financial investments a higher rate of return is supposed to compensate the investor or lender for the higher risk exposure. Risks in the supply chain can be classified into three main categories: (1) operational: the risk of interruption of the flow of goods or services, (2) financial: the risk that the price of the goods or services acquired will change significantly, and (3) reputational risk.

All three risks affect the survival, competitiveness, and bottom line of the organization and may occur simultaneously.

Operational Risk

Every business continuity plan recognizes that supply interruptions and delays may occur. Catastrophic events such as earthquakes, tornadoes, hurricanes, war, floods, or fire may totally disable a vital supplier. Strikes may vary in length, and even short-term interruptions related to weather, accidents on key roads, or any other short-term factor affecting the supply and/or transport of requirements may affect a buying organization's capability to provide good customer service.

A distinction can be drawn between factors beyond the purchaser's or supplier's control, such as weather, and those that deal directly with the supplier's capability of selecting its own suppliers, *managing internally, and its distribution* so as to prevent the potential of physical supply interruption. Careful supplier evaluation before committing to purchase can mitigate against the latter type of supply interruption. In situations of ongoing supply relationships, communication with key suppliers is essential. Such is the situation in the Sabor case at the end of the chapter. Ray Soles is concerned about the potential shortage of a key raw material and must come to an agreement with his suppliers to avoid possible supply disruptions.

Unfortunately, supply interruptions increase costs. If last-minute substitutions need to be made, these are likely to be expensive. Idle labor and equipment, missed customer delivery promises, and scrambling—all have increased costs associated with them.

Financial Risk

Quite different from supply interruptions are those risks directly associated with changes in the price of the good or service purchased. A simple example comes from the commodity markets. Increases in the price of oil affect prices paid for fuel, energy, and those products or services that require oil as a key ingredient or raw material.

A purchaser who has committed to a fixed-price contract may find a competitor able to compete because commodity prices have dropped. Currency exchange rate changes and the threat of shortages or supply interruption also will affect prices, as will arbitrary supplier pricing decisions. Changes in taxation, tolls, fees, duties, and tariffs also will affect cost of ownership.

Given that both supply interruption and price/cost risks directly impact any organization's ability to meet its own goals and execute its strategies, supply chain risks—whether they are on the supply side, internal to the organization, or on the customer side—need to be managed properly.

Reputational Risk

Reputational risk may be even more serious than operational or financial risks, because the loss of reputation may be catastrophic for a company. Both legal and ethical supply issues may affect the company's reputation. "You are known by the company you keep" applies not only to one's personal life, but also to corporate life. Thus, the reputation of a company's supply chain members will affect its own image. The internal and external communications decisions and behavior of supply personnel can have both negative and positive impacts. Therefore, the content of the legal issues and ethics (Chapter 15) is highly relevant to reputational risk. Adverse publicity with respect to bribery, kickbacks, improper quality, improper disposal and environmental practices, dealings with unethical suppliers, and so on, can be extremely damaging.

Managing Supply Risk

Managing supply risks require: (1) identification and classification of the risks, (2) impact assessment, and (3) a risk strategy.

Given that supply is becoming more and more global and supply networks more complex, risk identification is also becoming more difficult. The preceding discussion identifying supply interruption and price/cost changes as two categories has been highly

simplified. Technology, social, political, and environmental factors have not even been mentioned yet. Technology has the potential of interrupting supply through the failure of systems and through obsoleting existing equipment, products, or services, or drastically changing the existing cost/price realities. A purchaser committed to a long-term, fixed-price contract for a particular requirement may find a competitor can gain a significant advantage through a technology-driven, lower-cost substitute. Environmental regulation changes can drastically offset a supplier's capability to deliver at the expected price or to deliver at all.

Because the well-informed supply manager is probably in the best position to identify the various supply risks his or her organization faces, such risk identification should be a standard requirement of the job, including the estimation of the probability of event occurrence.

Impact assessment requires the ability to assess the consequences of supply interruption and/or price/cost exposure. Correct impact assessment is likely to require the input of others in the organization, such as operations, marketing, accounting, and finance, to name just a few. Assessed potential impact from identified risk may be low, medium, or high.

Combining potential impact assessment with the probability of event exposure creates a table of risks with low probability and low impact on one extreme and high probability with high impact on the other.

Obviously, high-impact, high-probability risks need to be addressed or, better yet, avoided, if at all possible.

Managing supply risks should be started at the supply level, but may escalate to the overall corporate level. Relatively simple actions such as avoiding high-risk suppliers or high-risk geographical locations, dual or triple sourcing, carrying safety stock, hedging, and using longer-term and/or fixed- or declining-price contracts and protective contract clauses have been a standard part of the procurement arsenal for a long time. If most purchasers had their way, they would like to transfer all risk to their suppliers! However, the assumption of risk carries a price tag, and a supplier should be asked to shoulder the risk if it is advantageous to both the supplier and purchaser to do so.

The Corporate Context

Supply risk is only one of the various risks to which any organization is exposed. Traditionally, financial risks have been the responsibility of finance, property insurance part of real estate, and so on. The emergence of a corporate risk management group headed by a risk manager or chief risk officer (CRO) allows companies as a whole to assess their total risk exposure and seek the best ways of managing all risks.

A supply manager's decision not to source in a politically unstable country because of his or her fear of supply interruption may also miss an opportunity to source at a highly advantageous price. A corporate perspective might show that the trade-off between a higher price elsewhere and the risk of nonsupply favors the apparently riskier option. Mergers and acquisitions as well as insourcing and outsourcing represent phenomena full of opportunities and risks in which supply input is vital to effective corporate risk resolution. The decision about how much risk any organization should be willing to bear and whether it should self-insure or seek third-party protection is well beyond the scope of this text. Nevertheless, it is clear that risk management is going to be an area of growing concern for supply managers.

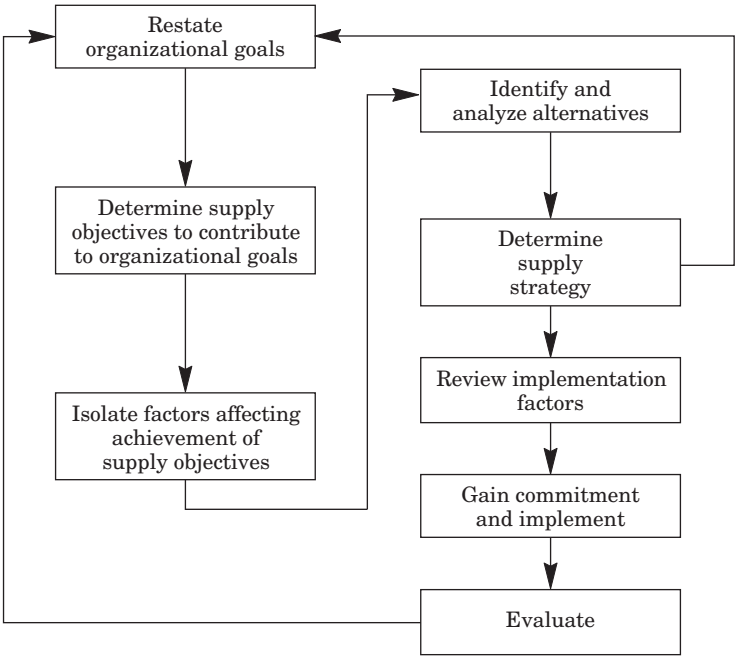

FIGURE 2–3
Strategic Supply Planning Process

Figure 2–3 is a conceptual flow diagram of the strategic supply planning process. It is important to recognize that the planning process normally focuses on *long-run opportunities* and not primarily on immediate problems.

STRATEGIC COMPONENTS

The number of specific strategic opportunities that might be addressed in formulating an overall supply strategy is limited only by the imagination of the supply manager. Any strategy chosen should include a determination of what, quality, how much, who, when, what price, where, how, and why. Each of these will be discussed further. (See Figure 2–4.)

What?

Probably the most fundamental question facing an organization under the "what" category is the issue of make or buy, insourcing, and outsourcing. Presumably, strong acquisition strengths would favor a buy strategy. (See Chapter 5: Make or Buy, Insourcing, and Outsourcing.)

Also included under the heading of what is to be acquired is the issue of whether the organization will acquire standard items and materials readily available in the market, as opposed to special, custom-specified requirements. Standard items may be readily acquired in the marketplace, but they may not afford the organization the competitive edge that special requirements might provide.

FIGURE 2–4
Supply Strategy Questions

1. What?
   - Make or buy
   - Standard versus special
2. Quality?
   - Quality versus cost
   - Supplier involvement
3. How Much?
   - Large versus small quantities (inventory)
4. Who?
   - Centralize or decentralize
   - Location of staff
   - Top management involvement
5. When?
   - Now versus later
   - Forward buy
6. What Price?
   - Premium
   - Standard
   - Lower
   - Cost-based
   - Market-based
   - Lease/make/buy
7. Where?
   - Local versus regional
   - Domestic versus international
   - Large versus small
   - Single versus multiple sourcing
   - High versus low supplier turnover
   - Supplier relations
   - Supplier certification
   - Supplier ownership
8. How?
   - Systems and procedures
   - E-commerce
   - Negotiations
   - Competitive bids
   - Fixed bids
   - Blanket orders/open orders
   - Systems contracting
   - Group buying
   - Materials requirements planning
   - Long-term contracts
   - Ethics
   - Aggressive or passive
   - Purchasing research
   - Value analysis
9. Why?
   - Objectives congruent
   - Market reasons
   - Internal reasons
     1. Outside supply
     2. Inside supply

Quality?

Part of the "what" question deals with the quality of the items or services to be acquired. Chapter 7 addresses the various trade-offs possible under quality. The intent is to achieve continuous process and product or service improvement.

Supplier Quality Assurance Programs

Many firms have concluded that a more consistent quality of end-product output is absolutely essential to the maintenance of, or growth in, market share. Suppliers must deliver consistent quality materials, parts, and components; this also will effect a marked reduction in production costs and in-house quality control administrative costs. Therefore, a strategy of developing suppliers' knowledge of quality requirements and assisting them in implementation of programs to achieve desired results may be needed. Three of the programs that might be used are:

1. *Zero defect (ZD) plans*. "Do it right the first time" is far more cost effective than making corrections after the fact.
2. *Process quality control programs*. These use statistical control charts to monitor various production processes to isolate developing problems and make needed adjustments

(corrections) before bad product is produced. The buying firm may need to assist the supplier with the introduction of the needed statistical techniques.

3. *Quality certification programs*. Here the supplier agrees to perform the agreed-upon quality tests and supply the test data, with the shipment, to the buying firm. If the seller does the requisite outgoing quality checks and can be depended on to do them correctly, the buying firm then can eliminate its incoming inspection procedures and attendant costs. This approach almost always is a key element in any just-in-time purchasing system, as discussed in the following section.

How Much?

Another major component of any supply strategy deals with the question of how much is to be acquired in total and per delivery. Chapter 8 discussed a number of trade-offs possible under quantity. In JIT and MRP, the trend has been toward smaller quantities to be delivered as needed, as opposed to the former stance of buying large quantities at a time to ensure better prices. Ideally, buyers and suppliers try to identify and eliminate the causes of uncertainty in the supply chain that drive the need for inventory, thus reducing the amount of inventory in the total system. One option available under the how much question may involve the shifting of inventory ownership.

The supplier maintains finished goods inventory because the supplier may be supplying a common item to several customers. The safety stock required to service a group of customers may be much less than the combined total of the safety stocks if the several customers were to manage their own inventories separately. This concept is integral to the successful implementation of systems contracting (discussed in Chapter 4).

From a strategic standpoint, supply may wish to analyze its inventory position on all of its major items, with a view to working out an arrangement with key suppliers whereby they agree to maintain the inventory, physically and financially, with delivery as required. Ideally, of course, the intent of both buyer and supplier should be to take inventory out of the system. An area in the buyer's facility may even be placed under the supplier's control.

Walmart and Zara are examples of two companies that have tailored their supply chains to create competitive advantage. Both companies, albeit in different industries, are able to keep inventories low, while maintaining customer services levels that match or exceed their competitors.

Other options are to switch to JIT purchasing or to consignment buying. If a supplier can be depended on to deliver needed purchased items, of the agreed-upon quality, in small quantities, and at the specified time, the buying firm can substantially reduce its investment in purchased inventories, enjoy needed continuity of supply, and reduce its receiving and incoming inspection costs. To accomplish this requires a long-term plan and substantial cooperation and understanding between buyer and seller.

In consignment buying, a supplier owns inventory in the buyer's facility under the buyer's control. The buyer assumes responsibility for accounting for withdrawals of stock from that consignment inventory, payment for quantities used, and notification to the supplier of the need to replenish inventory. Verification of quantities remaining in inventory then would be done jointly, at periodic intervals. This strategy has advantages for both supplier (assured volume) and buyer (reduced inventory investment) and is often used in the distribution industry.

Who?

The whole question of who should do the buying and how to organize the supply function has been addressed in Chapter 3. The key decisions are whether the supply function should be centralized or not, where staff should be located geographically, and to what extent top management and other functions will be involved in the total acquisition process. To what extent will teams be used to arrive at supply strategies?

When?

The question of when to buy is tied very closely to the one of how much. The obvious choices are now versus later. The key strategy issue really lies with the question of forward buying and inventory policy. In the area of commodities, the opportunity exists to go into the futures market and use hedging. The organized commodity exchanges present an opportunity to offset transactions in the spot and future markets to avoid some of the risk of substantial price fluctuation as discussed in Chapter 10.

What Price?

It is possible for any organization to follow some specific price strategies. This topic already has been extensively discussed in Chapter 11. Key trade-offs may be whether the organization intends to pursue paying a premium price in return for exceptional service and other commitments from the supplier, a standard price target in line with the rest of the market, or a low price intended to give a cost advantage. Furthermore, the pursuit of a cost-based strategy as opposed to a market-based strategy may require extensive use of tools such as value analysis, cost analysis, and negotiation. For capital assets, the choice of lease or own presents strategic alternatives, as discussed in Chapter 16.

Where?

Several possibilities present themselves under the question of where to buy. Many of these are discussed in Chapter 12 under "Source Selection." Obvious trade-offs include local, regional, domestic, or international sourcing; buying from small versus large suppliers; single versus multiple sourcing; and low versus high supplier turnover, as well as supplier certification and supplier ownership. Lastly, through reverse marketing or supplier development, the purchaser may create rather than select suppliers.

How?

A large array of options exists under the heading of "how to buy." These include, but certainly are not limited to, supply chain management integration systems and procedures; choice of technology; e-commerce applications; use of various types of teams; use of negotiations, auctions, competitive bids, blanket orders, and open order systems; systems contracting; group buying; long-term contracts; the ethics of acquisition; aggressive or passive buying; the use of purchasing research and value analysis; quality assurance programs; and reduction of the supply base. Most of these will be discussed in Chapters 3 through 12 in this text.

Why?

Every strategy needs to be examined not only for its various optional components, but also for the reason why it should be pursued. The normal reason for a strategy in supply is to make supply objectives congruent with overall organizational objectives and strategies at both an operational and strategic level. Other reasons may include market conditions, both current and future. Furthermore, there may be reasons internal to the organization, both outside of supply and inside supply, to pursue certain strategies. For example, a strong engineering department may afford an opportunity to pursue a strategy based on specially engineered requirements. The availability of excess funds may afford an opportunity to acquire a supplier through backward/vertical integration. The reasons inside supply may be related to the capability and availability of supply personnel. A highly trained and effective supply group can pursue much more aggressive strategies than one less qualified. Other reasons may include the environment. For example, government regulations and controls in product liability and environmental protection may require the pursuit of certain strategies.

What makes supply strategy such an exciting area for exploration is the combination of the multitude of strategic options coupled with the size of potential impact on corporate success. The combination of sound supply expertise with creative thinking and full understanding of corporate objectives and strategies can uncover strategic opportunities of a size and impact not available elsewhere in the organization.

Conclusion

The increasing interest in supply strategies and their potential contribution to organizational objectives and strategies is one of the exciting developments in the whole field of supply. Fortunately, as this chapter indicates, the number of strategic options open to any supply manager is almost endless. A significant difficulty may exist in making these strategies congruent with those of the organization as a whole. The long-term perspective required for effective supply strategy development will force supply managers to concentrate more on the future. The coming decade should be a highly rewarding one for those supply managers willing to accept the challenge of realizing the full potential of supply's contribution to organizational success.

Questions for Review and Discussion

1. What role can (should) supply play in determining a firm's strategy in the area of social and environmental issues and trends?
2. How can the supply manager determine which cost-reduction strategies to pursue?
3. Can you have a supply strategy in public procurement? Why or why not?
4. Why should a supply manager consider hiring (or obtaining internally) an employee without any supply background?
5. What can supply do to assist in minimizing a firm's risk of product liability lawsuits?
6. What factors have caused the current interest in, and attention to, strategic purchasing and supply planning?

7. What type of data would supply need to contribute to an organization's strategic growth? How might supply obtain such data?
8. How can supply sell itself more effectively internally?
9. What do you believe to be the most difficult obstacles to making a supply function strategic?
10. Why should supply be concerned about the balance sheet?

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Case 2–1

Spartan Heat Exchangers Inc.

On June 10, Rick Coyne, materials manager at Spartan Heat Exchangers Inc. (Spartan), in Springfield, Missouri, received a call from Max Brisco, vice president of manufacturing: "What can the materials department do to facilitate Spartan's new business strategy? I'll need your plan next week."

SPARTAN HEAT EXCHANGERS

Spartan was a leading designer and manufacturer of specialized industrial heat transfer equipment. Its customers operated in a number of industries, such as steel, aluminum smelting, hydro electricity generation, pulp and paper, refining, and petrochemical. The company's primary products included transformer coolers, motor and generator coolers, hydro generator coolers, air cooled heat exchangers, and transformer oil coolers. Spartan's combination of fin-tube and time-proven heat exchanger designs had gained wide recognition both in North America and internationally.

Sales revenues were $25 million and Spartan operated in a 125,000-square-foot plant. Spartan was owned by Krimmer Industries, a large privately held corporation with more than 10,000 employees worldwide, headquartered in Denver.

Rick Coyne summarized the business strategy of Spartan during the past 10 years: "We were willing to do anything for every customer with respect to their heat transfer requirements. We were willing to do trial and error on the shop floor and provide a customer with his or her own unique heat transfer products." He added, "Our design and manufacturing people derived greatest satisfaction making new customized heat transfer products. Designing and research capabilities gave us the edge in developing and manufacturing any kind of heat transfer product required by the customer. Ten years ago, we were one of the very few companies in our industry offering customized services in design and manufacturing and this strategy made business sense, as the customers were willing to pay a premium for customized products."

MANUFACTURING PROCESS

The customized nature of Spartan's product line was supported by a job shop manufacturing operation with several departments, each of which produced particular component parts, feeding a final assembly area. Each job moved from work center to work center, accompanied by a bill of material and engineering drawing. The first process involved fitting a liner tube (in which the fluid to be cooled passed) into a base tube. This base tube, made of aluminum, was then pressure bonded to the inner liner tube through a rotary extrusion process that formed spiral fins on the base tube. The depth of the fins and the distance between them determined the amount of airflow across the tubes, and thus the cooling efficiency and power of the unit.

After the tubes were formed, cabinet and end plate fabrication began. The tubes were welded to the cabinet and the end plates. Flanges were then welded to pairs of tubes on the other side of the end plates to create a looped system. The unit was then painted and fans and motors were installed. Finally, the unit was tested for leaks and performance, crated, and shipped to the job site for installation.

MATERIALS DEPARTMENT

Spartan's buyers sourced all raw material and components required by manufacturing and were responsible for planning, procurement, and management of inventories.

Rick managed an in-house warehouse used for housing the raw material inventories, maintained adequate buffer inventories, and executed purchase contracts with vendors, ensuring specifications were met while achieving the best possible price. Rick's department included two buyers, a material control clerk, an expediter, and two shippers-receivers.

It was common for Spartan to have multiple vendors for raw material supply, and the materials group used more than 350 vendors for its raw materials, with current lead times ranging from a few days to six weeks. This wide supplier base was necessitated by the customization strategy adopted by the company. Rick noted that approximately 35 percent of Spartan's purchases were for aluminum products, mainly tubes and sheets. On average the plant had $3.5 million worth of inventory, in the form of both raw and work in process. Raw material inventory constituted approximately 40 percent of the total. Rick estimated that Spartan had inventory turns of four times per year, which he believed was comparable to the competition.

Manufacturing operations regularly complained about material shortages and stockouts, and regular inventory audits

indicated significant discrepancies with inventory records on the company's computer system. Furthermore, a significant amount of stock was written off each year due to obsolescence. Rick suspected that production staff regularly removed stock without proper documentation and that workers frequently deviated from established bills of material.

NEW BUSINESS STRATEGY

Competition in the heat exchanger industry had increased dramatically over the past decade, with much of the new competition coming from Korea and Europe. Korean firms, with their low cost base, competed primarily on price, while European firms focused on standardizing their product lines to a few high-volume products and competed on delivery lead time and price. Spartan's competitors in Europe used assembly-line manufacturing processes, rather than batch or job shop operations.

Senior management viewed the competition from Europe and Korea as an imminent threat. Many of Spartan's customers had recently developed aggressive expectations regarding pricing and delivery lead times, and some key customers had decided to opt for standard product design, sacrificing custom design for lower cost and faster delivery.

The changing nature of the industry forced senior management to reexamine their business strategy. As a result, in January, a multidiscipline task force representing engineering, manufacturing, and sales was formed with the mandate to formulate a new five-year business strategy.

The new corporate strategy was finalized in May and reviewed with the management group on June 1 in an all-day staff meeting. The central theme of the new strategy was standardization of all product lines, in terms of both design and manufacturing, reducing variety to three or four basic lines for each product category. The sales department would no longer accept orders for specialized designs. The aim of the new strategy was to reduce the delivery lead time from 14 weeks to 6 weeks and to lower production costs dramatically.

NEW CHALLENGES FOR THE MATERIALS DEPARTMENT

Max Brisco indicated that he expected the materials group to play a major role in support of the new corporate strategy and needed to know by next week the specifics of Rick's plan. The task force had set a number of ambitious targets. First, customer lead times for finished products were to be reduced to six weeks from the current average of 14 weeks. Second, the new objective for inventory turns was 20 times. Meanwhile, raw material stockouts were to be eliminated. Third, Max believed that product standardization also would provide opportunities to reduce costs for purchased goods. He expected that costs for raw materials and components could be cut by 10 percent over the next 12 months.

Rick fully supported the new direction that the company was taking and saw this as an opportunity to make major changes. He knew that Max would want the specifics of his plan during the meeting in a week's time.

Case 2–2

Sabor Inc.

In mid-April, Ray Soles, vice president of supply chain management at Sabor Inc., had become increasingly concerned about the potential shortage of supply of marconil, a new high-tech raw material for air filtration. Sabor Inc.'s three suppliers, during the last two weeks, had advised Ray Soles to sign long-term contracts and he was trying to assess the advisability of such commitments.

SABOR INC.

Sabor Inc. of Cleveland, Ohio, produced high-quality consumer and industrial air conditioning and heating units. An extensive network of independent and company-owned installation and sales centers serviced customers throughout the North American market. Total company sales last year totaled $800 million.

AIR FILTRATION AND MARCONIL

Sabor Inc. for decades had sold air humidification and air filtration units along with its prime units in air heating and cooling. Until three years ago, air filtration had accounted for about 7 percent of total corporate sales and had been sold primarily as add-ons to a new air cooling/heating system. However, with the advent of marconil, air filtration had started to increase significantly as a percentage of total sales. Marconil, a new high-tech product developed as part of the U.S. space effort, had a range of

unique properties of high interest to a variety of industries. In the case of air filtration, when processed by a Sabor Inc. developed and patented process, marconil could be transformed into a thin, very light, and extremely fine meshlike sponge material capable of filtering extremely small particles.

Given the population's sensitivity to air quality and the increasing number of people with asthma and allergies, the new Sabor filters became popular, not only with new Sabor air system installations but also as retrofits in older air conditioning and heating systems. Moreover, compared to electronic air cleaners that cost about three times as much to install and required monthly cleaning, marconil filters had to be replaced every six months, guaranteeing a continued sales volume of filters for years to come. When combined with an ultraviolet light unit, which killed airborne bacteria, a marconil air cleaning system was considered a huge leap forward in air treatment.

The manufacturing cost of a marconil filter accounted for about 28 percent of its selling price.

AIR FILTRATION SALES

Along with the marconil filtration system introduction three years ago, Sabor's marketing department had initiated a significant promotional campaign directed at both the industrial and consumer sectors. Marketing's ability to forecast sales accurately had not been impressive, according to Ray Soles. For the first year, marketing had forecast marconil filter sales at $1 million, when in reality they sold $11 million. In the second year, the forecast was for $15 million and actual sales were $29 million, and, in the third year, a forecast of $40 million turned into actual sales of $72 million. The marketing department expected sales growth to level off over the next three years to a rate of 20 percent per year.

MARCONIL SUPPLY

Sabor's first marconil supplier was Bilt Chemical, a longtime supplier of paints and adhesives to Sabor and a large, diversified, innovative chemical producer that held the patent on marconil. Ray Soles did not like the idea of single sourcing and, therefore, when marconil requirements rose significantly in the second year, he brought in a second supplier, Warton Inc., which not only produced the marconil raw materials (under license from Bilt Chemical), but also manufactured a variety of marconil products in the textile and automotive fields. In the third year, Ray had secured a third supplier, G. K. Specialties, a much smaller company than Bilt Chemical and Warton Inc., which also produced marconil under license for its own applications in aerospace and the military, but which had some excess capacity that it sold on the open market.

All three suppliers sold marconil at identical prices, which had increased over the past three years. Actual volumes purchased by Sabor Inc. from each of the three suppliers were as shown in Exhibit 1. The current price of marconil from all three suppliers was $50.00.

SUPPLIER PROPOSALS FOR LONG-TERM CONTRACTS

During the first two weeks of April, Ray Soles was visited by each of his current three marconil suppliers with Bilt Chemical first. Each warned that a shortage of marconil supply was looming and that unless Ray was willing to sign a long-term contract, they would not be in a position to guarantee supply. However, each proposal was different.

Bilt Chemical proposed a five-year contract with take-or-pay commitments of 25,000 pounds for the current year and 20 percent annual increases in volume for each of the following years. Prices were subject to escalation

EXHIBIT 1
Sabor Marconil Purchases and Prices

Company	Capacity (in pounds)	Purchases (in pounds)		
		Year 1	Year 2	Year 3
Bilt Chemical	80,000	5,000	10,000	20,000
Warton Inc.	40,000	0	3,000	8,000
G. K. Specialties	20,000	0		4,000
Prices		$39.00	$42.00	$44.00

for energy, raw material, and labor every quarter based on the current $50.00 price per pound.

Warton Inc. proposed a two-year contract for 10,000 pounds each year with similar price provisions to those of Bilt Chemical.

G. K. Specialties suggested an agreement for 12.5 percent of Sabor's annual requirements, which could be dropped at any time by either party, but which proposed a price of $56.00 for the current year, to be adjusted semiannually, thereafter based on inflation, energy, labor, and material.

Although Ray Soles did not know much about the actual manufacturing process for marconil, he had heard that increases in capacity were expensive. He also understood that two of the three component raw materials for marconil were by-products from industrial processes that were reasonably stable.

Since Ray Soles had been able to buy almost all of Sabor's needs on quarterly, semiannual, or annual contracts, he was not particularly keen on departing from his current supply practice. He had heard some rumors that in a few years a much lower-cost substitute for marconil might be developed. He suspected that, therefore, his current suppliers were anxious to tie Sabor to a long-term commitment.

APRIL 15

On April 15, the Bilt Chemical sales representative sent an e-mail to Ray Soles requesting a meeting on April 22. The e-mail concluded, "I would like to bring my sales manager so that we may discuss our proposal for the marconil with you. We will not be able to guarantee you supply after August 1, if you are unable to commit."

Case 2–3

Ford Motor Company: Aligned Business Framework[2]

Tony Brown, senior vice president of global sourcing at Ford Motor Company (Ford), was putting the finishing touches on his plan for the company's new supply chain strategy—"Aligned Business Framework" (ABF). ABF was a bold step that would significantly change the relationships between Ford and its suppliers. Tony described his motivation: "We want to operate a supply chain management system that delivers on the dimensions of quality, technology, delivery and cost, while executing programs in a disciplined fashion with faster time-to-market."[3]

It was August 10, 2005, and Tony was expected to review the final details of his proposal with company chairman and CEO William Clay (Bill) Ford Jr. before making a formal public announcement the following month. ABF would substantially reduce the number of suppliers and give those that remained long-term contracts and early involvement in new product development programs. Tony expected that the strategy would provide benefits to Ford through overall lower costs, while suppliers would benefit from long-term financial stability and profitability. The question remained, however, how he would convince Ford's supplier community to commit to the principles of ABF.

FORD MOTOR COMPANY

Founded in 1903, Ford was the no. 2 U.S. automaker with global sales of approximately $177 billion. In 2005, its global brands included Ford, Lincoln, Mercury, Jaguar, Land Rover, Aston Martin, and Volvo.[4] In recent years all of the "Detroit 3" (General Motors, Ford, and Chrysler) automakers were struggling under intense global competition, rising fuel prices, and steep product discounts and rebates. In the most recent quarter, Ford reported a $1.1 billion operating loss and the company's debt had recently been downgraded to junk-bond status. To turn around company performance, Ford had announced plans to cut its salaried workforce, reduce capacity by closing plants and selling the Hertz rental car division, and ramp up production of hybrid vehicles.[5]

[2] This case has been written on the basis of published sources only. Consequently, the interpretation and perspectives presented in this case are not necessarily those of Ford Motor Company or any of its employees.

[3] Tom Stundza, "Ford Has a Better Idea," *Purchasing* 135, no. 12 (2006), p. 49.

[4] Ford Motor Company 2005 annual report.

[5] Jeffrey McCracken, "Ford Retools: Seeks Big Savings by Shaking Up Parts Supply System," *The Globe & Mail,* September 29, 2005, p. B19.

ALIGNED BUSINESS FRAMEWORK (ABF)

The Ford global supply chain included approximately 2,500 production and 9,000 nonproduction suppliers, with operations in more than 60 countries, supporting 107 Ford manufacturing sites. Total purchases in 2005 were more than $90 billion for roughly 250 production commodities (e.g., seats, heating and cooling systems, advanced electronics, and steering systems) and 500 nonproduction commodities (e.g., health care, software, logistics, and marketing and advertising services). The more than 130,000 active production parts accounted for approximately $70 billion of total annual purchases.[6]

Historically Ford leaned heavily on suppliers for annual across-the-board price reductions that averaged approximately 3 percent, although requests for more substantial reductions were commonplace. This environment had created contemptuous relationships between Ford and its suppliers, which were reinforced through annual performance evaluations and bonuses for buyers based on achieving year-over-year price reduction objectives. The foundation of the new ABF strategy was a cultural shift from confrontational to collaborative supplier relationships. Tony commented on his assessment of Ford's current supply chain strategy: "We have a problem with the business model in this industry. It is not working effectively for our suppliers. It is not working effectively for us. When my day is dominated by issues related to financially distressed suppliers, commodity price shocks, quality problems and costs issues, it's clear to me that there must be a better approach."[7]

ABF targeted companywide cost reductions of 10 percent of Ford's annual spend of production parts by 2010—$7 billion per year—by adopting what Tony considered best practices approach to supply chain management and supplier partnerships: "It's an environment between Ford and a select family of suppliers where innovative ideas can emerge, and then be incubated, evaluated and incorporated into our products."[8] Under the new system, preferred suppliers would be matched with Ford purchasing and engineering managers to work on projects to achieve quality, cost, and delivery goals. The 20 key elements of the ABF that Tony planned to propose are provided in Exhibit 1, which Brown described as "a kinder, gentler era of cooperation from global suppliers that can be implemented beyond North America."[9]

EXHIBIT 1 **Key Elements of ABF[10]**

Ford Commitments	Bilateral Commitments	Supplier Commitments
• Up-front reimbursement of supplier engineering, design, and testing • Long-term sourcing • Improved commonality and reuse • Improved product, cycle plan, and forecast volume stability • Sharing of forecast volumes and product plans (beyond 3 years) • More disciplined program execution through Ford Global Product Development system	• Achieve best-in-class quality • Data transparency • Agree on detailed cost models • Focus on total costs, included elimination of emphasis on bins • Competitive cost at Job no. 1, with less emphasis on year-over-year price reductions • Open collaboration on global manufacturing, engineering footprint • Ongoing senior leadership communication • Data exchange remains confidential	• Share current financial data to demonstrate health • Backstop other commodity suppliers • Manage and assure proper working conditions in their facilities and in the facilities of sub-tiers • Sourcing of minority- and women-owned suppliers • Use mutually agreeable multiparty agreement in directed tier 2 sourcing scenarios • Technological innovations will be provided to Ford

[6] www.ford.com/aboutford/microsites/sustainability-report-2006-07.

[7] Stundza, "Ford Has a Better Idea, p. 49.

[8] Ibid.

[9] Ibid.

[10] Presentation by Tony Brown, October 7, 2005, www.*oesa.org/cmspages/getAttch.php?id=180.*

Tony was proposing that in the first phase of the ABF implementation, his supply organization would focus on 20 high-impact commodity groups, such as seats, tires, and bumpers, where the automaker spent approximately $35 billion per year with 200 suppliers. The plan was to reduce the number of suppliers for these commodities to 100 by the 2009 model year. In the long term, Tony's objective was to shrink the production supply base from 2,500 to 1,000.[11]

FINALIZING THE PLAN

Tony recognized that there would be a great many questions from other Ford executives, members of his purchasing organization and suppliers regarding how ABF would be implemented. There were obviously going to be winners and losers from the existing Ford supplier community under ABF and many of Ford's existing suppliers would have to be told that they would not be participating in future programs. The preferred suppliers would have many questions regarding how their relationships would function with Ford in the future. For example, it was expected that suppliers would benefit from higher capacity utilization as a result of the increased production volumes. Furthermore, additional benefits were anticipated from greater collaboration, early supplier involvement in new product development, and supplier innovation. How would the associated costs and benefits be measured and shared among Ford and its suppliers?

Ford had a decades-long tradition of confrontational relationships with its supplier community. A recent survey of North American automotive tier 1 suppliers ranked Ford second to last with a score of 157 versus top-ranked Toyota at 415 and Honda at 375 (scale: 500 = very good, 0 = very poor).[12] Turning around relationships with suppliers could take years. Given the difficult times in the industry and at Ford, Tony knew that Bill Ford would have questions about supplier skepticism regarding the company's motivations behind ABF and how quickly the plan would start to show results.

Tony Brown believed that it was necessary to make major changes to Ford's supply chain if the company was going to survive. As he got ready for his meeting with Mr. Ford, Tony pondered how he should proceed with implementation, and specifically how suppliers could be convinced to buy into the principles of ABF. Tony commented on the challenges that ABF presented: "This is not business as usual. We're not only asking our suppliers to step up. We're also asking ourselves to step up."[13]

[11] Jeffrey McCracken, "Ford Retools: Seeks Big Savings by Shaking Up Parts Supply System," p. B19.

[12] John Henke, *Planning Perspectives,* Birmingham, Michigan, 2008.

[13] "Ford Key Suppliers Roll Out Innovative Business Model," Ford Motor Company press release, September 29, 2005, http://media.ford.com.newsroom/release.

Chapter Three

Supply Organization

Chapter Outline

Objectives of Supply Management

Organizational Structures for Supply Management
- *Small and Medium-Sized Organizations*
- *Large Organizations*
- *Centralized and Decentralized Supply Structures*
- *Hybrid Supply Structure*
- *Specialization within the Supply Function*
- *Structure for Direct and Indirect Spend*
- *Managing Organizational Change in Supply*

Organizing the Supply Group
- *The Chief Purchasing Officer (CPO)*
- *Reporting Relationship*

Supply Activities and Responsibilities
- *What Is Acquired*
- *Supply Chain Activities*
- *Type of Involvement*
- *Involvement in Corporate Activities*
- *Influence of the Industry Sector on Supply Activities*

Supply Teams
- *Leading and Managing Teams*
- *Cross-Functional Supply Teams*
- *Other Types of Supply Teams*

Consortia

Conclusion

Questions for Review and Discussion

References

Cases
- *3–1 Iowa Elevators*
- *3–2 Lambert-Martin Automotive Systems Inc.*

Key Questions for the Supply Decision Maker

Should we

- Separate sourcing and commodity management responsibilities?
- Use cross-functional sourcing teams to make better supply decisions?
- Move towards greater centralization?

How can we

- Fit supply's organizational structure better with the structure of the corporate organizational structure?
- Gain the maximum benefits from our organizational structure?
- Structure and manage teams for effectiveness and efficiency?

Every organization in both the public and private sector is in varying degrees dependent on materials and services supplied by other organizations. No organization is self-sufficient. Even the smallest office needs space, heat, light, power, communication and office equipment, furniture, stationery, and miscellaneous supplies to carry on its activities. Purchasing and supply management is, therefore, one of the key business processes in every organization. Almost every company has a separate supply function as part of its organizational structure. One important management challenge is ensuring effective use of the resources and capabilities of the supply organization and the supply chain or network to maximize supply's contribution to organizational objectives.

Managing the balance between the competitive environment, corporate strategy, and organizational structure is an ongoing process for every company. Senior management selects strategies designed to address competitive challenges and adopts an appropriate corporate organizational structure to complement the company's strategy. The structure of supply has to be congruent with this organizationwide structure. The challenge for the chief purchasing officer (CPO) is to manage the supply organization to deliver the maximum benefits within the predefined structure. For example, a chief executive might decide that a decentralized organizational structure is appropriate in order to allow flexibility in responding to customer requirements. The supply organization also would be decentralized to the various business units to fit the corporate organizational model.

The organizational structure of the supply function influences how supply executes its responsibilities, how it works with other areas of the firm, and the skills and capabilities needed by supply personnel. Regardless of the structure adopted, work must be assigned to ensure the efficient and effective delivery of goods and services to the organization. This requires managing personnel and delegating responsibilities. Managing the people in the supply organization to their full potential is a significant challenge.

In this chapter, three questions are addressed: (1) What are the objectives of supply? (2) How might supply be organized to achieve these objectives effectively and efficiently? (3) What are the activities and responsibilities of supply management?

OBJECTIVES OF SUPPLY MANAGEMENT

The standard statement of the objectives of the supply function is that it should obtain the *right materials* (meeting quality requirements), in the *right quantity,* for delivery at the *right time* and *right place,* from the *right source* (a supplier who is reliable and will meet its commitments in a timely fashion), with the *right service* (both before and after the sale), and at the *right price* in the short and long term. The supply decision maker might be likened to a juggler, attempting to keep several balls in the air at the same time, for he or she must achieve these seven *rights* simultaneously.

It is not acceptable to buy at the lowest price if the goods delivered are unsatisfactory from a quality/performance standpoint, or if they arrive two weeks behind schedule. On the other hand, the *right* price may be higher than normal if the item in question is an emergency requirement where adherence to normal lead time would result in a higher total cost of ownership. The *right price* is one aspect of lowest total cost of ownership. The supply decision maker attempts to balance the often conflicting objectives and makes trade-offs to obtain the optimum mix of these seven rights. Obtaining this balance with an eye to both the short term and the long term requires supply managers to have both a tactical and strategic perspective.

A more encompassing statement of the overall goals of supply would include the following nine goals:

1. *Improve the organization's competitive position.* As a strategic player, the activities of supply management must be focused on contributing to overall organizational strategy, goals, and objectives. Supply managers must identify and exploit opportunities in the supply chain to contribute to revenue enhancement, asset management, and cost reduction. Supply can secure the lowest total cost source of supply, provide access to new technologies, and design flexible delivery arrangements, fast response times, access to high-quality products or services, and product design and engineering assistance.

   Companies that are successful in the long run must constantly look for opportunities in the supply chain to provide a superior value proposition for their customers, and supply represents a key area for such opportunities. Strategic supply is concerned with the long-term survival and prosperity of the organization. It focuses on bottom-line impact, the income statement, and the balance sheet. Chapter 2 discusses the potential contributions of purchasing and supply management to the overall strategy of the organization and specific internal supply strategies for strengthening the organization's competitive position.

2. *Provide an uninterrupted flow of materials, supplies, and services required to operate the organization.* Stockouts or late deliveries of materials, components, and services can be extremely costly in terms of lost production, lower revenues and profits, and diminished customer goodwill. For example: (1) an automobile producer cannot complete the car without the purchased tires, (2) an airline cannot keep its planes flying on schedule without purchased fuel, (3) a hospital cannot perform surgery without purchased surgical tools, and (4) an office cannot be used without purchased maintenance services.

3. *Keep inventory investment and loss at a minimum.* One way to ensure an uninterrupted material flow is to hold large inventories. But inventory assets require use of capital that cannot be invested elsewhere, and the cost of carrying inventory may be

20 to 50 percent of its value per year. For example, if supply can support operations with an inventory investment of $10 million instead of $20 million, at an annual inventory carrying cost of 30 percent, the $10 million reduction in inventory represents a savings of $3 million in addition to freeing $10 million in working capital.

4. *Maintain and improve quality.* A certain quality level is required for each material or service input; otherwise the end product or service will not meet expectations or will result in higher-than-acceptable costs. The cost to correct a substandard quality input could be huge. For example, a spring assembled into the braking system of a diesel locomotive can cost less than $5.00. However, if the spring turns out to be defective when the locomotive is in service, the replacement cost is in thousands of dollars, caused by the teardown required to replace the spring, the lost revenue to the railroad because the locomotive is not in service, and the possible loss of locomotive reorders. Continuous improvement in supplier quality is directly linked to an organization's ability to compete effectively on a worldwide basis.

5. *Find or develop best-in-class suppliers.* The success of supply depends on its ability to link supply base decisions to organization strategy and its skill in locating or developing suppliers, analyzing supplier capabilities, selecting the appropriate supplier, and then working with that supplier to obtain continuous improvements. Only if the final selection results in suppliers who are both responsive and responsible will the firm obtain the items and services it needs.

6. *Standardize, where possible, the items bought and the processes used to procure them.* Standardization refers to the process of agreeing on a common specification or process. Specifications and processes may be standardized across an organization, an industry, a nation, or the world. Supply should constantly strive to standardize its capital equipment, materials, maintenance, repair, and operating (MRO) supplies, and services purchases wherever and whenever possible. For materials, standardization often leads to lower risk in the marketplace, lower prices through volume purchase agreements, and lower inventory and tracking costs while maintaining service levels. In the case of capital equipment, standardization results in reduction in MRO inventories and reduced costs for training staff on equipment operation and maintenance. In the case of services, standardization leads to supply base reduction, lower operating costs, more consistent service levels, and lower prices. Supply management process standardization also can result in shortened cycle time, lower transaction costs, and greater opportunities to share knowledge across functional and organizational boundaries. Because standardization touches on multiple stakeholders, it usually requires cross-functional and sometimes cross-organizational teamwork.

7. *Purchase required items and services at lowest total cost of ownership.* Purchased goods and services in the typical organization represent the largest share of that organization's total costs. Consequently, the profit-leverage effect discussed in Chapter 1 can be significant. Price is the most convenient method to compare competing proposals from suppliers. However, supply's responsibility is to obtain the needed goods and services at the lowest total cost of ownership, which necessitates consideration of other factors—such as quality levels, after-sales service, warranty costs, inventory and spare parts requirements, downtime, and so forth—that in the long term might have a greater cost impact on the organization than the original purchase price.

8. *Achieve harmonious, productive internal relationships.* Supply managers cannot effectively accomplish their goals and objectives without effective cooperation with the appropriate individuals in other functions. Therefore, it is useful to examine relationships between supply and key internal business partners:

Supply and design engineering. Close to 70 percent of the value of any given requirement is established during the first few phases of the standard acquisition process: recognition and description of need. Therefore, close cooperation between design engineering and supply to assure proper specifications is essential. The design must be driven by final customer requirements for value and satisfaction, and be designed for manufacturability and procurability. It is obvious that such close liaison also needs proper involvement of marketing, operations, and finance/accounting to recognize these opportunities and constraints. It is during the design phase that all of these varied interests need to be appropriately incorporated, something that is unlikely to happen unless the various functional experts can represent their points of view well and are able to work effectively as a team. Too frequently, the failure to include supply considerations properly at the design stages results in inadequate product or service performance, costly delays, rework, and end user dissatisfaction.

Supply and operations. In most organizations, close supply–operations coordination is essential to operational excellence. In manufacturing companies especially, the total task of integrated logistics, meeting end-customer demands on the one side and using the supply networks on the other, while managing material and information flow, equipment, people, and space effectively, represents an incredible challenge. Meeting quality, delivery, quantity, cost, flexibility, and continuity objectives profitably and competitively requires strategic as well as tactical skills of both operations and supply managers.

Supply and marketing/sales. Since supply and marketing are mirror images of each other, with negotiation and customer service in common, there are benefits from greater integration of the two functions. Although research indicates that supply is not typically included in marketing planning, supply and marketing often serve on new product development teams in organizations. Supply can offer information on current and future market conditions and negotiation expertise; and marketing can keep supply up to date on marketing campaigns, special promotions, and sales forecasts and involve supply in meetings with end customers to help supply better understand customer needs. In many organizations, there is an effort to use a strategic sourcing process for spend categories such as advertising and media. This effort requires close cooperation of supply and marketing.

Supply and accounting/finance. Supply and accounting/finance interact in the areas of accounts payable, planning, and budgeting. Lack of horizontal goal alignment often leads to behavior in one area that conflicts with behavior in the other area. For example, finance/accounting may adopt a payment policy that is at odds with the payment terms of the contract. From the finance perspective, holding onto cash as long as possible is a good way to contribute to the organization's financial goals. From the supply perspective, building sound, mutually beneficial relationships with key

suppliers contributes to financial performance. Supply managers often argue that accounting focuses too much on short-term gains from holding cash rather than the longer-term benefits of a strong buyer–supplier relationship that is influenced by paying according to contractual payment terms. Improved communication between supply and accounting/finance and greater goal congruence can help to alleviate some of the problems. Supply can help finance by providing funds flow forecasts, focusing on inventory minimization, and providing market information.

9. *Accomplish supply objectives at the lowest possible operating costs.* It takes resources to operate supply: salaries, communications expense, supplies, travel costs, computer costs, and accompanying overhead. The objectives of supply should be achieved as efficiently and economically as possible. Process inefficiencies represent waste and lead to excessive operating costs and unnecessarily high total cost of ownership. Supply managers should be continually alert to improvements possible in purchasing and supply processes, methods, procedures, and techniques. For example, opportunities to reduce transaction costs include e-procurement systems that automate the process from requisition to payment and purchasing cards and e-catalogs for small-value purchases. Companies with efficient supply processes can create competitive advantage through reduced costs, improved flexibility, faster time to market, and greater compliance, while allowing supply personnel to concentrate on value-added activities.

The objectives of supply must ultimately contribute to the attainment of short- and long-term organizational strategy, goals, and objectives. The process and function can be organized in a number of different ways to maximize supply's contribution effectively and efficiently.

ORGANIZATIONAL STRUCTURES FOR SUPPLY MANAGEMENT

Ultimately the supply organization structure must be aligned with the corporate structure and strategy. In addition, organizational size and the need for specialization with supply also need to be taken into account.

Small and Medium-Sized Organizations

In practice it has been proven that assigning the supply function to supply professionals, properly trained and charged with the appropriate responsibilities and authorities, contributes more efficiently and effectively to organizational goals and strategies than assigning supply responsibilities to those for whom supply is a secondary responsibility. Nevertheless, in single business unit organizations, particularly small enterprises, it is not unusual to see supply responsibilities shared by a variety of individuals who have no supply expertise and purchase their own requirements from local retailers or wholesalers. As the size of the business unit increases, the idea of assigning a professional the responsibility of supply emerges and a separate function is created.

The size and activities of the supply function in a single business unit organization will depend on a number of factors, such as the size of the company and the nature of its business. Figure 3–1 provides an example of a supply organization in a typical medium-sized,

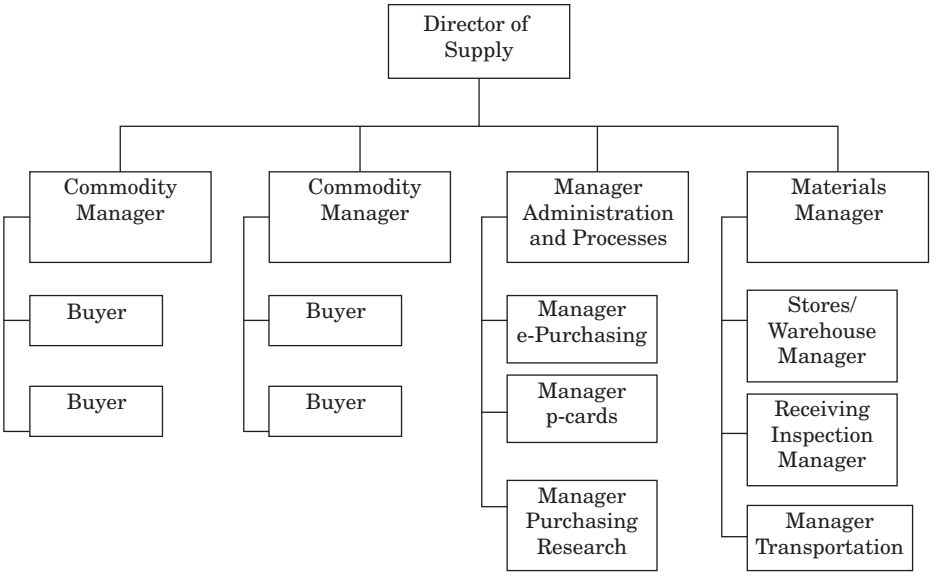

FIGURE 3–1
Example of a Typical Supply Organization in a Single-Location, Medium-Sized Company

single business unit enterprise. Obviously in small companies where the supply staff consists of only one or two individuals, the staff is expected to be flexible in terms of their capabilities and skills. Specialization will occur as the organization gets larger and the company can afford to hire additional supply personnel.

Large Organizations

In large companies the centralization–decentralization issue is of key importance for the supply structure. The overall corporate structure sets the framework for the supply structure. Structural options can be viewed as a continuum ranging from centralized at one extreme to decentralized at the other. Centralization refers to where spending decisions are made, not where the purchasing and supply staff are located geographically. Therefore, the degree of centralization is reflected by the amount of spend managed or controlled by corporate supply. Three common organizational models are:

1. Centralized, where the authority and responsibility for most supply-related functions are assigned to a central organization.
2. Hybrid, where authority and responsibility are shared between a central supply organization and business units, divisions, or operating plants. Hybrid structures may lean more heavily toward centralized or decentralized depending on how decision-making authority is divided. One type of hybrid supply structure is a "center-led" organization in which strategic direction is centralized and execution is decentralized.
3. Decentralized, where the authority and responsibility for supply-related functions are dispersed throughout the organization.

CAPS Research conducts a wide range of benchmarking reports that can be accessed through their website. The benchmark reports include a breakdown of supply staff at the operational and strategic levels in the participating organizations.

Centralized and Decentralized Supply Structures

There are advantages and disadvantages to centralization and to decentralization. Table 3–1 summarizes the advantages and disadvantages of a centralized supply structure and Table 3–2 summarizes the advantages and disadvantages of a decentralized supply structure.[1]

Hybrid Supply Structure

In an organization with multiple business units, divisions or business units often sell different products or services requiring a different mix of purchased items. Often the division or business unit is operated as a profit center where the division manager is given total responsibility for running the division, acts as president of an independent firm, and is judged by profits made by the division. Since purchases are frequently the largest single controllable cost of running most businesses and have a direct effect on its efficiency and competitive position, the profit-center manager may insist on having direct authority over supply. This has led firms to adopt decentralized–centralized supply, or a hybrid organizational structure, in which the supply function is partially centralized at the corporate or head office and partially decentralized to the business units.

Often the corporate supply organization works with the business unit supply departments in those tasks that are more effectively handled on a corporate basis: (1) establishment

TABLE 3–1
Potential Advantages and Disadvantages of Centralization

Advantages	Disadvantages
• Strategic focus	• Lack of business unit focus
• Greater buying specialization	• Narrow specialization and job boredom
	• Cost of central unit highly visible
• Ability to pay for talent	• Corporate staff appears excessive
• Consolidation of requirements—*clout*	• Tendency to minimize legitimate differences in requirements
• Coordination and control of policies and procedures	• Lack of recognition of unique business unit needs
• Effective planning and research	• Focus on corporate requirements, not on business unit strategic requirements
	• Most knowledge sharing one-way
• Common suppliers	• Even common suppliers behave differently in geographic and market segments
• Proximity to major organizational decision makers	• Distance from users
• Critical mass	• Tendency to create organizational silos
• Firm brand recognition and stature	• Customer segments require adaptability to unique situations
• Reporting line—*power*	• Top management not able to spend time on suppliers
• Cost of purchasing low	• High visibility of purchasing operating costs

[1] M. R. Leenders and P. F. Johnson, *Major Structural Changes in Supply Organizations* (Tempe, AZ: CAPS Research, 2000).

TABLE 3–2
Potential Advantages and Disadvantages of Decentralization

Advantages	Disadvantages
• Easier coordination/communication with operating department	• More difficult to communicate among business units
• Speed of response	• Encourages users not to plan ahead • Operational versus strategic focus
• Effective use of local sources	• Too much focus on local sources—ignores better supply opportunities • No critical mass in organization for visibility/effectiveness—"whole person syndrome" • Lacks clout
• Business unit autonomy	• Suboptimization • Business unit preferences not congruent with corporate preferences • Small differences get magnified
• Reporting line simplicity	• Reporting at low level in organization
• Undivided authority and responsibility	• Limits functional advancement opportunities
• Suits purchasing personnel preference	• Ignores larger organization considerations
• Broad job definition	• Limited expertise for requirements
• Geographical, cultural, political, environmental, social, language, currency appropriateness	• Lack of standardization
• Hide the cost of supply	• Cost of supply relatively high

of policies, procedures, controls, and systems; (2) recruiting and training of personnel; (3) coordination of the purchase of common-use items in which more "clout" is needed; (4) auditing of supply performance; and (5) development of corporatewide supply strategies. Therefore, hybrid organizational structures attempt to capture the benefits of both centralized and decentralized structures by creating an organizational structure that is neither completely centralized nor decentralized. (See Figure 3–2.)

Structure affects processes, procedures, systems, and relationships. Whether supply is centralized, decentralized, or a hybrid, supply personnel must focus on maximizing the advantages of the structure and minimizing the disadvantages. Supply managers can develop and implement strategies to overcome the obstacles and fully exploit the opportunities of organizational and supply structure.

Specialization within the Supply Function

If the supply organization is to contribute well to organizational goals and objectives, it needs to be staffed by professionals with clearly defined responsibilities. Specialization within the supply department allows staff to develop expertise in particular areas and may require the creation of specialized groups within the supply organizational structure. Most large supply organizations consist of four general areas of specialization: sourcing and commodity management, materials management, administration, and supply research.

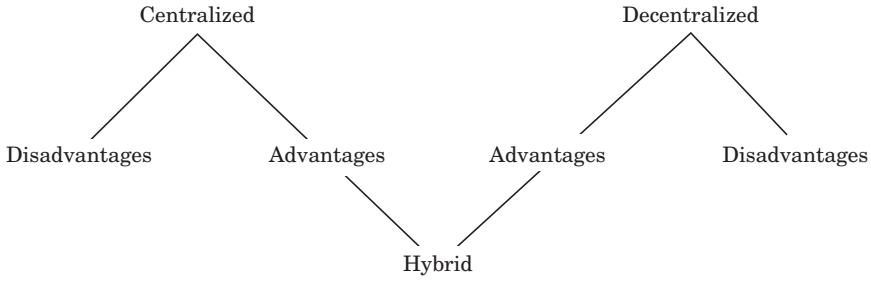

FIGURE 3–2
Potential Advantages of the Hybrid Structure

Sourcing and Commodity Management

These personnel develop commodity strategies, identify potential suppliers, analyze supplier capabilities, select suppliers, and determine prices, terms, and conditions of supplier agreements; they create contracts and purchase orders. This activity is normally further specialized by type of commodity to be purchased, such as raw materials (which may be further specialized); fuels; capital equipment; office equipment and supplies; and MRO. Figure 3–3 presents a job description for a commodity specialist at Deere & Company.

A variation of commodity management is project buying, in which the specialization of buying and negotiation is based on specific end products or projects, requiring the buyer to be intimately familiar with all aspects of the project from beginning to end. Project buying might be used in the supply organization of a large general contractor, where the purchasing for each job is part of a self-contained, temporary organization. At the completion of the project, the buyer then would be reassigned to another project. The United States Defense Acquisition University trains special project managers who are responsible for the proper acquisition and development of new military equipment initiatives. Such projects may last as long as 20 years.

Materials Management

This group manages the contract after it is signed, directs the flow of materials and services from the supplier, and keeps track of the supplier's delivery and quality commitments to avoid any disruptive surprises. If problems develop, the materials management group pressures and assists the supplier to resolve them. Materials management activities are frequently handled at the local plant or office level and involve regular communication with suppliers concerning requirements, such as order quantities and delivery dates. Figure 3–4 presents a job description for a supply management planner.

Administration

This group handles the physical preparation and routing of the formal purchase documents, manages the department budget, keeps the necessary data required to operate the department, and prepares reports needed by top management and supply. These personnel will likely manage operation of information systems, including e-procurement systems, B2B e-commerce, and electronic data interchange (EDI).

FIGURE 3–3
Commodity Specialist Job Description for Deere & Company

JOHN DEERE

Job Title:	Commodity Specialist
Department:	Supply Management
Job Function:	Locate sources for and procure materials, products, supplies or services to support the assigned commodity requirements of the enterprise. Manage the relationships with suppliers.

Primary Duties:

1. Manage source selection and development through a team process including the evaluation of cost, quality, and manufacturing systems.
2. Develop and manage internal and external supplier/customer relationships, including strategic alliances where appropriate.
3. Lead and/or participate on simultaneous engineering teams; facilitate the integration of suppliers into the product delivery process (PDP).
4. Evaluate the cost-effectiveness of designs, procure tooling, and qualify processes to assure the product meets specifications.
5. Make recommendations for design change and/or influence design through personal or supplier involvement.
6. Develop and execute supply management strategies to manage cost, quality, and continuous improvement.
7. Develop material control and logistics objectives.
8. Act as a primary communications link between tactical and strategic purchasing functions and business units; participate in team activities.

Supply Research

Supply researchers work on special projects relating to the collection, classification, and analysis of data needed to make better purchasing decisions. Activities include studies on use of alternate materials, long-range demand, price and supply forecasts, and analysis of what it should cost an efficient supplier to produce and deliver a product or service.

This group is also responsible for performing benchmarking studies. Johnson Controls, a global automotive supplier, uses its "materials best business practice" process to benchmark purchases at the commodity level. Cross-functional teams, made up of staff from supply, engineering, and finance, evaluate commodities and work with suppliers to eliminate or reduce gaps in performance requirements.[2]

[2] M. Siegfried, "Fundamental Best-In-Class Values," *Inside Supply Management* 19, no. 7, (2008) p. 30.

FIGURE 3–4
Supply Management Planner Job Description for Deere & Company

JOHN DEERE

Job Title:	Supply Management Planner
Department:	Supply Management
Job Function:	To expedite, schedule, and/or analyze requirements for purchased materials in accordance with established requirements and inventory control criteria. May interact with suppliers to establish procedural agreements, obtain delivery commitments, and resolve quality problems.

Primary Duties:

1. Manages specific supplier performance and feedback along with managing day-to-day business plan and relationships with supplier.
2. Plans and/or executes inventory goals by product/supplier and plans/develops delivery system to meet material control objectives (i.e., JIT delivery, P.O.U.D., EDI).
3. Schedules material based on requirements and expedites deliveries that are delinquent or expected to be delinquent. Tracks and resolves problems with inbound shipments.
4. Interprets systems output to determine items requiring follow-up to suppliers on materials ordered to assure on-time delivery.
5. Is involved with the day-to-day problem resolution/corrective action with suppliers: to scrap, return, reclaim, or replace rejected material. Is responsible for bringing products within specifications.
6. Acts as the primary communications link between tactical and strategic purchasing functions and business unit; participates in supply management team activities.
7. Costs and implements current part revisions, including tooling, as part of the decision processing activity. Also reads and reacts to engineering decisions.
8. Conducts price/economic order quantity analysis and compares multiple quotes, including piece price, freight, duty, performance systems, and supplier rating. Also investigates invoice price errors.

Structure for Direct and Indirect Spend

Direct spend includes any goods that go into the end product or service; indirect spend is comprised of the goods and services that are needed to run the organization. Indirect spend includes purchases such as professional services, utilities, travel, employee benefits, and office supplies. In many organizations, the locus of control over direct spend is in a highly centralized supply group. This makes sense because anything that ultimately touches the final customer is worthy of expertise.

Indirect spend, on the other hand, is often outside the loop of a structured sourcing process and supply authority and responsibility is often left in the hands of the internal user. For

example, a marketing manager needing to hire temporary labor would conduct the purchasing process in his or her own way. This highly decentralized approach leads to a fragmented spend for temporary labor, including multiple suppliers, multiple rates, and varying contract terms and conditions. This is partly due to the belief that these types of purchases require a level of knowledge and expertise not found in a typical supply department.

The increasing focus on strategic cost management has led many senior managers to turn their attention to indirect spend to realize cost savings, reductions, or avoidances. To better manage indirect spend, some organizations will pull indirect spend categories into the purchasing process. Others expect supply managers to convince internal users that there is value in following a structured sourcing process. In some cases, supply provides analysis and recommendations, but the budget owner makes the purchasing decision. Cross-functional teams consisting of internal users (often across business units) and buyers or commodity managers may be given responsibility for the category. Sourcing, evaluating, and selecting suppliers for indirect spend will be discussed in greater detail in Chapter 12. Any purchase dollars that are not managed through a structured sourcing process may represent a target for cost savings, reduction, or avoidance.

Managing Organizational Change in Supply

Firms frequently make major changes to their supply organizational structure. A CAPS Research focus study was conducted, in part, to answer two questions: (1) Why are there so many structural changes in supply organizations at large companies? (2) If the hybrid organizational structure is theoretically so attractive, then why do so many large firms not use this structure and/or move out of it?[3] First, the researchers found that organizational structure change was the result of a change in the overall corporate organizational structure. In none of the situations did the chief purchasing officer (CPO) have free choice to select the supply organizational structure that he or she deemed appropriate for the circumstances. Rather, the supply organizational structure was forced to be congruent with the overall corporate structure. The challenge for supply executives, therefore, was to maximize the benefits of the organizational structure while minimizing the disadvantages.

Secondly, there are a number of implementation issues to consider when making a major organizational structure change in supply. Major changes affect the lives of many people and create an atmosphere of apprehension among the staff. Implementing change places significant pressures on the CPO, who not only has to worry about managing the day-to-day affairs of the supply department, but also has to successfully implement the organizational change. The challenges associated with these issues frequently contribute to the need to seek assistance from consultants when implementing a major structural change.

The Lambert-Martin Automotive Systems Inc. case at the end of this chapter describes a large automotive parts company with a decentralized supply function. The recent appointment of a new CEO has resulted in questions being asked about whether the company should rethink its organizational structure and centralize some supply activities.

Changes toward Centralization

Two major concerns facing organizations when they move the supply function towards greater centralization are sources of supply talent and the availability of information related to the total corporate spend. During the transition, the source of supply talent at all levels

[3] Leenders and Johnson, *Major Structural Changes in Supply Organizations*.

of the supply function is a significant challenge. Experienced senior corporate-level supply personnel may not exist in-house. How and where to develop such organizational talent represented an important implementation issue. Some firms place a greater priority on CPO credibility within the organization, as opposed to previous supply experience. Others identify new CPOs with previous supply experience to handle the change process. At the middle and junior levels, additional staff with specialized skills in areas such as contracting is required. Quite often, the existing supply talent in the decentralized organization is perceived to lack the required training or experience needed in the new centralized environment.

Changes toward Decentralization

The CAPS Research focus study identified one implementation issue unique to the sites in the study moving toward decentralization: how to dismantle the centralized supply unit effectively. For example, Ontario Hydro created a shared services function that was responsible for negotiating corporatewide agreements and establishing and maintaining corporate purchasing policies, while the business units were responsible for materials management activities. The approach taken by Hoechst was to create a separate legal entity, Hoechst Procurement International, which would also offer purchasing services to other companies on a fee-for-service basis. The key objective in both situations was to preserve at least some of the organization's core supply capabilities and talent, while adapting to the new structural requirements of the company.

ORGANIZING THE SUPPLY GROUP

Once the corporate organizational structure is set, no matter what organizational design is chosen, delegation takes place within it. Whether the organization structure is based on functions, products, or business processes is immaterial; what really matters is that work must be assigned and executed in accordance with strategic plans and organizational goals. It follows logically that organizational planning and delegation are important segments of the integration of strategic goals and organizational designs.

The following sections describe the key aspects of supply organizational design, including the role of the chief purchasing officer, supply's status in the organization, and its reporting relationship and internal relationships. Even though the focus is on large supply organizations, many of the comments are also relevant for smaller supply organizations.

The Chief Purchasing Officer (CPO)

The chief purchasing officer (CPO) or chief supply officer (CSO) is defined as the "most senior" or "top level" executive in a "firm's corporate (executive level) office *or* major division, such as a strategic business unit (SBU), who has formal authority and responsibility to manage his or her firm's (or SBU's) purchasing, buying or sourcing functions for the procurement of goods and services from external suppliers."[4] The CPO's responsibilities may be divided and apportioned among managers and departments, but the functional responsibility and authority of the CPO should be definitely recognized. Moreover, functionalization implies that all the responsibilities reasonably involved in the supply function

[4] T. E. Hendrick and J. Ni, *Chief Purchasing Officers' Mobility, Compensation Benchmarks, and Demographics: A Study of Fortune 500 Firms* (Tempe, AZ: CAPS Research, 2007).

must be given to the CPO, covering the relevant supply network links as well as the full range of organizational needs. The essential principle is that there are certain universally recognized duties pertinent to this function and that these duties should be placed in a separate group equal in status with the other major functions of the organization.

Changes in the supply management field have affected everything from what the function is called to the titles of the people performing the tasks to the tasks that are performed. There is no common title for the individual who holds the top supply position in a large organization in North America. Depending on the role of supply in the organization, the reporting line, and where it is placed on the organization chart, the title may be chief purchasing officer, vice president, director, or manager. Attached to that may be purchasing, procurement, supply management, sourcing, strategic sourcing, logistics, or supply chain management. It is quite common to see CPO titles such as vice president, strategic sourcing and supply; vice president, purchasing; vice president, supply chain management; or director, global procurement. The titles in the cases used in this text provide a good range of titles in current use.

Profile of the CPO

The following profile of the average CPO emerged from a recent CAPS Research focus study.[5] The average CPO is a well-educated 51-year-old who has been at his or her organization for 14 years and CPO for 4.6 years, compared to 5.9 years in 1995. While most CPOs have previous experience in supply, approximately 80 percent of the CPOs in the study had worked in at least one other function. Approximately 70 percent of CPOs had the title of vice president and the title most likely included the word *procurement, purchasing, supply chain,* or *supply management* in it, such as vice president, global procurement or vice president of supply chain management.

Typically there are one to two levels between the CPO and the CEO. The most common CPO reporting lines were senior vice president/group VP (22 percent), executive vice president (17 percent), vice president of finance/CFO (17 percent), and president/CEO (13 percent). Seventy-seven percent of the CPOs in the CAPS study reported to one of the top five executive position categories (president/CEO, COO, executive vice president, senior vice president/group vice president, and CFO/vice president of finance).

The CPO may have overall management responsibility for nontraditional purchases such as corporate travel, food services, real estate, IT hardware and software, printing, and benefits. Additionally, the CPO might have responsibility for logistics (which includes inbound and outbound transportation, fleet management, warehousing, materials handling, order fulfillment, inventory management, supply/demand planning, and management of third-party logistics providers), quality, accounts payable, document/contract management, leadership of the supply process, materials, distribution, and facility management.

CPO Trends

Several trends have emerged in the past decade regarding the profile and role of the CPO:[6]

- Education levels are increasing. Almost all CPOs hold a bachelor's degree; about half, a graduate degree, typically an MBA.

[5] P. F. Johnson and M. R. Leenders, *Supply's Organizational Roles and Responsibilities* (Tempe, AZ: CAPS Research, May 2012).

[6] P. F. Johnson, and M. R. Leenders, *Supply Leadership Changes* (Tempe, AZ: CAPS Research, 2007).

- Reporting lines are changing. CPOs tend to report higher in the organization than they did in the 1980s and 1990s.
- CPOs are increasingly being hired from outside the organization rather than promoted from within. CPO tenure with their organization declined to 14 years in 2011, from 18 years in 1995, and more than one-third of CPOs are hired into the position from another firm.
- CPOs are increasingly being hired from functional areas other than supply. This was the case in approximately 40 percent of the CPOs in the CAPS Research study.
- When a new CPO replaces a current CPO, the current CPO is promoted or leaves the company for a similar position in another firm.
- CPO reporting lines change every 2.5 years on average, which means that the typical CPO will have at least two different bosses during his or her tenure in the role.
- The CPO role is still new in many organizations.

Reporting Relationship

The executive to whom the CPO reports gives a good indication of the status of supply and the degree to which it is emphasized within the organization. If the chief purchasing officer has the title of vice president and reports to the CEO, this indicates that supply has been recognized as a top management function. Reporting to the CEO, however, is not essential. CEOs in large organizations have a broad portfolio of responsibilities, ranging from shareholder relations to corporate strategy. Reporting to one of the other top five senior executives (executive vice president, senior vice president/group vice president, and CFO/vice president of finance) in the firm can provide supply the organizational clout and exposure needed to play a significant role. These individuals may have more time and interest in the supply chain issues facing the organization. If supply reports to an executive too low in the organization, the less influence supply is likely to have on corporate strategy.

When supply is not given the same status as other functions, it must be placed under another senior functional executive. In many cases, supply reports to the chief financial officer because of the immediate impact of supply decisions on cash flows, the size of the annual spend, and the amount of money tied up in inventory. Organizational focus on strategic cost management also supports the decision to place supply under finance. In organizations where a high percentage of annual spend is for production requirements, supply often reports to the top manufacturing executive. In a shared services model, supply along with legal, accounting, human resources, and other functions might report to an administrative vice president. In a heavily engineering-oriented firm, the reporting relationship might be to the chief of engineering to get closer communication and coordination on product specification and quality control.

Factors that influence the level at which the supply function is placed in the organizational structure cover a broad spectrum. Among the major ones are:

1. The amount of purchased material and outside services costs as a percentage of either total costs or total income of the organization. A high ratio emphasizes the importance of effective performance of the supply function.
2. The nature of the products or services acquired. The acquisition of complex components or extensive use of subcontracting represents a difficult supply problem.
3. The extent to which supply and suppliers can provide competitive advantage.

The important consideration in determining to whom supply should report relates to where it will be most effective in realizing its contribution to the organization's objectives. Supply should report at a level high enough in the organization so that the key supply aspects of strategic managerial decisions will receive proper consideration.

SUPPLY ACTIVITIES AND RESPONSIBILITIES

Supply management can be described as a series of activities that must be managed effectively for the organization to deliver best value to the final customer. Roles and responsibilities of supply fall into four general categories: (1) what is acquired, (2) supply chain activities, (3) type of involvement in categories 1 and 2, and (4) involvement in corporate activities.[7]

What Is Acquired

The items acquired by the supply group vary from organization to organization and items are added or deleted depending on circumstances in the buying organization. The acquisition segments include raw materials, standard and special direct purchases, MRO, capital, services, and resale. Nontraditional purchases are spend categories that have typically been managed outside of the purchasing and supply management process. In some organizations, purchasing activities are limited to production-related materials and services, leaving responsibility for nonproduction or indirect materials and services in the hands of users.

The amount of annual spend that falls outside the management or control of supply ranges from a low of about 2 percent to a high of about 40 percent. This often includes large amounts for capital equipment, utilities, insurance, computers and software, travel, real estate, and construction services. Senior management in many organizations has recognized the significant opportunities from applying the skills of their supply group and the benefits of a structured sourcing process in the acquisition of nontraditional materials and services.

The Iowa Elevators case demonstrates the opportunities for supply to capture cost reductions in a large service organization. Exhibit 2 in the case provides a list of spend categories that include direct (e.g., farm supplies) and indirect (e.g., travel) purchases.

Supply Chain Activities

Supply has assumed greater responsibilities in a wide range of areas, including those not seen as traditional, as companies strive to leverage profit opportunities and create competitive advantage through their supply practices. Today's supply management organization has more responsibilities than the traditional "buying" activities once associated with the function. The activities handled by the supply function vary from firm to firm, even within the same industry. However, regardless of company size, there are a number of activities common to most supply organizations (see Table 3–3).

The addition or deletion of activities in any organization can be categorized as internally or externally focused. Internally focused activities include accounts payable, centralized coordination of purchasing, cost management, legal, materials management and logistics,

[7] M. R. Leenders and P. F. Johnson, *Major Changes in Supply Chain Responsibilities* (Tempe, AZ: CAPS Research, 2002).

TABLE 3–3
Supply Activities

Area of Responsibility	Activities
Purchasing/buying	• Creating contracts and supply agreements for materials, services, and capital items • Managing key purchasing processes related to supplier selection, supplier evaluation, negotiation, and contract management
Purchasing research	• Identifying better techniques and approaches to supply management, including benchmarking processes and systems • Identifying medium- and long-term changes in markets and developing appropriate commodity strategies to meet future needs • Identifying supply chain trends and opportunities for better materials and services
Inventory control	• Managing inventories and expediting material delivery • Establishing and monitoring vendor-managed inventory systems
Transportation	• Managing inbound and outbound transportation services, including carrier selection
Environmental and investment recovery/disposal	• Managing supply chain–related activities to assure compliance with legal and regulatory requirements and with company environmental policies • Managing disposal of surplus materials and equipment
Forecasting and planning	• Planning production and forecasting short-, medium-, and long-term requirements
Outsourcing and subcontracting	• Evaluating potential suppliers and negotiating contracts • Supporting the transition from internal production to external supply and vice versa
Nonproduction/nontraditional purchases	• Managing cost-effective delivery of nonproduction and nontraditional purchases, such as office supplies, security services, janitorial services, advertising, and insurance
Supply chain management	• Implementing and managing key supplier relationships and supplier partnerships, including supplier development and participation on cross-functional and cross-organizational teams • Developing strategies that use the supply network to provide value to end customers and contribute to organizational goals

production planning, quality, and supply budget and financial management. Externally focused activities may have either a supplier focus or a customer focus. Supplier-focused activities include inbound logistics, supplier development, raw material procurement for suppliers, supplier evaluation and communication, e-procurement, and outsourcing or subcontracting. Customer-focused activities include outbound logistics, involvement with new business development and new product development, and programs and customer bid support.

Type of Involvement

Supply can have no involvement, documentary, professional, or meaningful involvement in what is acquired and in supply chain activities. No involvement means supply is excluded completely. Documentary involvement requires the supply function to act as a recorder, a sender of purchase orders, or a receiver of bids, but important supply decisions are made outside supply. Professional involvement implies that supply professionals have the opportunity to exercise their expertise in important acquisition process stages. Meaningful involvement means that parties outside the supply group are willing and able to take supply considerations into account in managing their own areas of responsibility. They routinely and actively request input and assistance from supply personnel and, in turn, also are involved in supply decisions traditionally considered the prerogative of supply. One measure of meaningful involvement is the extent to which supply is expected to take part in major corporate activities.

Involvement in Corporate Activities

Major strategic corporate initiatives include mergers and acquisitions, new facility planning, new product development, outsourcing, revenue enhancement, technology planning, corporate e-commerce initiative, and corporate cost reduction initiative.

Influence of the Industry Sector on Supply Activities

The industry sector influences supply responsibilities. Firms that manufacture discrete goods such as cars, consumer electronics, apparel, and furniture face a significant number of dynamic, product-related pressures that affect the supply function and that are less likely to occur in commodity-oriented process industries. These pressures include changing consumer preferences, product innovation, and relatively short product life cycles.

Purchased materials and services also represent a high percentage of the cost of sales for firms in discrete goods industries. For example, purchased materials and services can represent 60 to 80 percent of the average cost of an automobile. Consequently, firms in discrete goods industries are likely to have supply departments that play a key role in each step in the materials cycle, from product design to production.

The role of supply in process industry firms, such as oil and gas, chemicals, glass, and steel industries, is typically different compared to firms in discrete goods industries. Many process industry firms have two supply organizations: a specialized supply group, such as a commodity trading department, that frequently handles purchasing for important raw materials and a purchasing group responsible for the acquisition of materials, supplies, and services that support the operation of facilities. For example, it is common practice for crude oil acquisition in most large integrated oil companies to be handled by a commodity trading group, while other purchases are handled by the supply organization. As a result, although the cost of purchased materials and services might represent a substantial portion of the total cost of sales, the supply function for firms within processing industries is frequently excluded from the acquisition of the single most important raw material.

In the public not-for-profit sector and service sectors, most purchases are for end use within the organization itself, with the exception of purchases for resale, such as in distribution and retail. In fast-growing organizations, capital purchases may represent a large percentage of total acquisition expenditures.

SUPPLY TEAMS

Corporate organization structures are leaner, flatter, more adaptive, and more flexible than in the past. Rigid functional structures have been replaced by a greater dependence on cross-functional teams that overlay the functional organization to push decisions lower in the organizational hierarchy. Teams bring together a number of people, often from different functional areas, to work on a common task. It is believed that teams provide superior results compared to individual efforts as a result of the range of skills, knowledge, and capabilities of team members. They also promote cross-functional cooperation and communication and may facilitate consensus building in the organization.

Teams are used by a number of functions for a variety of purposes, such as improvements in quality, cost, or delivery; product development; process engineering; and technology management. They can be project oriented or ongoing. Project teams are brought together for a limited time to achieve a specific goal or outcome, such as completion of a capital project or an e-commerce initiative. Ongoing teams continue indefinitely, such as a commodity-sourcing team that manages the purchasing process and supplier relationships.

Leading and Managing Teams

Changing to a team-based workplace requires a significant level of commitment and training of management and individual team members. Critical success factors include:

- Supportive organizational culture, structure, and systems.
- A common compelling purpose, measurable goals, and feedback for individuals and the team.
- Organized for customer satisfaction rather than individual functional success.
- All functional areas involved in up-front planning, shared leadership roles, and role flexibility.
- The right people (right qualifications), in the right place (on a team that needed their skills), at the right time (when those skills were needed).
- A common, agreed-upon work approach and investment in a high level of communication.
- Dedication to performance and implementation with decisions delegated to the appropriate level.
- Integration of all relevant functional areas and various teams throughout the project life cycle.

Senior management often tries to combine the flexibility of decentralized supply management and the buying power and information sharing of centralized supply through the use of teams. Various types of purchasing and supply management teams may be used, including cross-functional teams, teams with suppliers, teams with customers, teams with both suppliers and customers, supplier councils (key suppliers), purchasing councils (purchasing personnel only), commodity management teams (purchasing personnel only), and consortia (pool buying with other firms).

Cross-Functional Supply Teams

Cross-functional teams consist of personnel from multiple functions focused on a supply-related task. It is generally believed that high-performing, cross-functional teams will get better results on the task, with greater benefit to the organization as a whole, at lower

costs, in less time, with greater stakeholder buy-in. Effective cross-functional teams save time by allowing a simultaneous, rather than a sequential, approach. For example, if key stakeholder groups are involved in the development of a new process from concept through design, development, and rollout, the process may be better to start with, more widely accepted, and adopted quickly. The cycle time may be less than the nonteam approach but more of the work is concentrated at the beginning of the process.

Three important cross-functional supply teams are sourcing, new product development, and commodity management.

Sourcing Teams

A cross-functional sourcing team includes supply and representatives from other relevant functional areas. The team can focus on a wide range of projects including developing cost-reduction strategies; developing local, business unit, or organizationwide sourcing strategies; evaluating and selecting suppliers; performing value analysis; analyzing spend; and identifying consolidation opportunities.

For example, to foster internal strategic business alignment, the CPO at General Mills created a position called director of sourcing operations (DSO). The prime focus of the DSO was to work with cross-functional business unit teams comprised of marketing, R&D, manufacturing, distribution, and accounting on important strategic initiatives. The DSO brought a sourcing perspective and provided a leadership role and alignment between sourcing strategies and business unit strategies. Specific initiatives were proposed as part of the annual business plan and DSO performance was evaluated considering team results.[8]

New Product/Service Development Teams

Effective new product or service development processes can improve an organization's competitive position. Cross-functional teams can shorten development cycle times, improve quality, and reduce development costs by operating concurrently rather than sequentially. Rather than each functional area performing its task and passing the project off to the next functional area, the key functional groups—usually design, engineering, manufacturing, quality assurance, purchasing, and marketing—work on the new product development simultaneously. Because a large percentage of a product's cost is purchased materials, early supplier involvement is often needed. When surveyed, many supply managers report greater involvement in new product/service design and development.

Commodity Management Teams

Commodity management teams are formed when expenditures are high and the commodity is complex and important to success. These are generally permanent teams that provide increased expertise, more cross-functional coordination and communication, better control over standardization programs, and increased communication with suppliers. They develop and implement commodity strategies aimed at achieving the lowest total cost of ownership. They engage in a number of activities, including supply base reduction, consolidation of requirements, supplier quality certification, management of deliveries and lead times, cost savings projects, and management of supplier relationships.

The Delphi Corporation case in Chapter 13 describes how the company used approximately 30 commodity teams, across four categories—chemical, electrical, metallic, and technological—to manage approximately 80 percent of its spend.

[8] Johnson and Leenders, *Supply Leadership Changes*, p. 59.

Other Types of Supply Teams

In addition to the three common forms of cross-functional teams, there are at least six additional approaches to supply teams: supplier participation, customer participation, co-location of supply, co-location of suppliers, supplier councils, and supply councils.

Teams with Supplier Participation

Supplier participation in cross-functional sourcing teams depends on the nature of the assignment. For example, it makes sense to include suppliers in teams assigned to develop supplier capabilities or improve supplier responsiveness, but not on teams assigned to evaluate and select new suppliers.

Involving suppliers at the product design stage can produce substantial benefits and is common in discrete goods manufacturing industries, such as automotive and consumer electronics. The development of the Boeing 777 commercial aircraft made extensive use of supplier participation on cross-functional teams, enabling successful design and production in record time. Automotive manufacturers periodically give suppliers primary responsibility for designing major components, such as seating systems. The Ford Motor Company case in Chapter 2 provides an example of a company that engages suppliers early in the product-development process to identify opportunities for cost and quality improvements and supplier innovation.

Intellectual property issues and confidentiality are perhaps the biggest obstacles to supplier participation, particularly when new product design is involved. Some firms ask suppliers to sign confidentiality agreements to minimize the potential effect of this obstacle on the team's effectiveness.

Teams with Customer Participation

In an effort to be truly customer driven, some organizations include end customers on their teams. For example, when a commercial airframe maker designs a new passenger aircraft, it makes sense to have potential airline customers participate in the design team. They know best the characteristics a new aircraft must have from the airline perspective, given its anticipated passenger loads, route structures, maintenance plans, and passenger service strategies. If supply is also included in teams with end customers, there is a greater opportunity to deliver the greatest value in the shortest cycle time.

Co-location of Supply with Internal Customers

Locating buyers with internal customers (e.g., engineering or operations) can help to break down barriers between functions as individuals get to know, and learn to work with, each other. Close proximity fosters greater awareness that leads to better understanding of the goals, strategies, and challenges of each group. Also, internal customers are more likely to involve supply in decisions if the buyer is readily accessible when questions arise. Buyers can "sell" other departments on their worth by providing market intelligence including information on availability, suppliers, and specific commodities. The best selling point is a measurable outcome such as cost reduction, improved quality, or a better specification.

Co-location of Suppliers in the Buying Organization

As organizations look for ways to do more work with fewer people and achieve the productivity and competitiveness goals of the firm, they are increasingly looking to suppliers for expertise and assistance. Having key supplier personnel located in the buying organization

who can function as buyers, planners, and salespeople can improve buyer–seller communications and processes, absorb work typically done by the firm's employees, and reduce administrative and sales costs.

Supplier Councils

A number of large firms, such as General Motors and Boeing, use supplier councils to manage supplier relationships. Supplier councils usually consist of 10 to 15 senior executives from the company's preferred supplier base, along with six to eight of the buying firm's top management. For example, General Motors has two primary forums for formal discussions with suppliers. The GM Supplier Business Council consists of 10 global suppliers who meet with the vice president of global purchasing and supply chain on a monthly basis to address broad, industrywide topics. The second forum is a global GM Supplier Business Meeting that is webcasted to GM's suppliers each month to gain input on GM-specific topics. Suppliers who participate in this webcast represent approximately 80 percent of the value of GM vehicles.

Supplier councils usually meet two to four times per year and deal with supply policy issues at the buying firm with the objectives of developing relationships and improving communication with the supply base. Supplier councils allow suppliers to be proactive participants in the supply management activities at the buying firm and can be useful forums to communicate strategies to key suppliers, identify problems with the supply base early on, and agree upon competitive targets in areas such as cost, quality, and delivery.

Supply Councils

Supply councils, also referred to as purchasing councils, are generally comprised of senior supply staff and are established to facilitate coordination among the business units, divisions, or plants. Many firms use supply councils as a means of sharing information among decentralized units, or coordinating activities focused on a specific problem that might involve several supply groups. The goals of the council are to manage buyer–supplier relationships properly and to encourage continuous improvement.

For example, Wellman, a manufacturer and distributor of polyester fibers and PET resins, had a decentralized supply organization, where plant purchasing reported to the local manager at each site. The corporate purchasing council consisted of site purchasing leadership. It concentrated on standardizing purchasing processes, standardizing goods and services across sites, aggregating requirements and leveraging volume for lower prices, and simplifying and streamlining the materials process. The council also formulated annual business plans and objectives for purchasing.[9]

CONSORTIA

Purchasing consortia are a form of collaborative purchasing that is used by both public and private-sector organizations as a means of delivering a wider range of services at a lower total cost. Purchasing consortia can take one of several forms, ranging from informal groups that meet regularly to discuss purchasing issues, to the creation of formal centralized consortia for the purpose of managing members' supply activities. Consortia are quite

[9] Leenders and Johnson, *Major Changes in Supply Chain Responsibilities*.

common in not-for-profit organizations, particularly educational institutions and health care organizations. Interest in the concept in the for-profit sector was sparked by the ability to run Internet-based consortiums, also called electronic exchanges or marketplaces, and the lack of antitrust obstacles (see Chapters 4 and 15).

Savings through price reductions are a primary motivation for the creation and participation in purchasing consortia. Other benefits are opportunities for staff reductions, product and service standardization, improved supplier management capabilities, specialization of staff, and better customer service.

Despite the benefits, hesitation to participate in consortia may be due to concerns about:[10]

- *Antitrust issues.* Collaboration might be viewed as anticompetitive by the U.S. Department of Justice's Antitrust Division and/or the Federal Trade Commission.
- *Bureaucracy.* The consortium may become bureaucratic, difficult to manage, and costly to coordinate.
- *Complexity.* Fear that "open enrollment" will bring together buyers with widely diverse needs and philosophies toward buyer–seller relations, resulting in untenable complexity and dysfunction.
- *Competitors.* Fear that the competition might be allowed to join.
- *Confidentiality.* Disclosure of sensitive information. Therefore, most items purchased through consortia are nonstrategic, such as MRO components and routine services.
- *Supplier resistance.* Strong suppliers may resist participating in consortium arrangements.
- *Distribution channels.* Some believe existing distributors provide adequate pricing and services.
- *Equality.* A firm currently has preferred relationships with suppliers/free riding. The unequal size of member organizations can create difficulties with respect to the allocation of benefits.
- *Uncertainty.* Some were concerned costs would not decline and service levels would.
- *Standardization and compliance.* The degree of uniqueness of requirements and the costs of standardizing products and services.
- *Governance.* Loss of control and reporting relationships were concerns.

Successful consortia are able to address these hurdles by achieving the following six objectives:[11]

1. Reducing total costs for the members through lower prices, higher quality, and better services.
2. Eliminating and avoiding all real and perceived violations of antitrust regulations.
3. Installing sufficient safeguards to avoid real and perceived threats concerning disclosure of confidential and proprietary information.

[10] T. E. Hendrick, *Purchasing Consortiums: Horizontal Alliances among Buying Firms Buying Common Goods and Services* (Tempe, AZ: Center for Advanced Purchasing Studies, 1997); P. F. Johnson, "The Pattern of Evolution in Public Sector Purchasing Consortia," *International Journal of Logistics: Research & Applications* 2, no. 1 (1999), pp. 57–73.

[11] Hendrick, *Purchasing Consortiums: Horizontal Alliances among Buying Firms Buying Common Goods and Services*.

4. Mutual and equitable sharing of risks, costs, and benefits to all stakeholders, including buying firms/members, suppliers, and customers.
5. Maintaining a high degree of trust and professionalism of the consortium stakeholders.
6. Maintaining a strong similarity among consortium members and compatibility of needs, capabilities, philosophies, and corporate cultures.

Conclusion

There is no one perfect organizational structure for supply. Its organizational structure will mirror the overall corporate structure. The challenge for supply executives is to maximize the benefits of their organizational structure, whether it is centralized, decentralized, or hybrid. Major research into organizational issues over the last decade has provided useful insights into innovative attempts to integrate the supply function and suppliers more effectively into organizational goals and strategies. No matter where the supply function is situated on the organization chart, each individual member of the supply organization has the opportunity to improve relations with internal customers and suppliers in an effort to make a greater contribution to organizational objectives.

Questions for Review and Discussion

1. Relate the objectives of supply to (1) a company producing automobiles, (2) a large fast-food restaurant chain, (3) a financial institution, and (4) an integrated oil company.
2. What are the challenges faced by a supply manager working in a highly centralized structure? In a highly decentralized structure?
3. How does specialization within supply differ in small and large organizations?
4. What are the reasons for giving the CPO a title and reporting line equal to marketing, engineering, or other key business functions?
5. What are indicators that supply is "meaningfully involved"?
6. What are the challenges in expanding the role of the CPO?
7. What implementation factors would you consider when asked to change the supply organization from a centralized to a hybrid structure? What factors would you consider if moving from decentralized to centralized?
8. How is team buying likely to affect the purchasing/supply function over the next decade?
9. Why and how would you go about setting up a consortium for the purchase of fuel, oil, furniture, corrugated cartons, or office supplies?

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Case 3–1

Iowa Elevators

Scott McBride, director of purchasing at Iowa Elevators, was reviewing information collected by his analyst, Cathy Ritchie, as he prepared for a meeting with the executive management team scheduled for Wednesday, June 11. Scott had been asked by Walter Lettridge, Iowa Elevator's CEO, to present a five-year plan for the purchasing department at the meeting. In preparation for the meeting, Scott asked Cathy to prepare a report analyzing all expenditures made by the company with outside suppliers over the previous year. It was now June 3, and Scott knew there was still a lot of work that had to be completed to get ready for the meeting the following week.

IOWA ELEVATORS

Iowa Elevators was one of the largest grain-handling companies in the United States. Headquartered in Des Moines, Iowa, the company had annual revenues of $2.3 billion and employed more than 2,500 people. Its two business units were the grain-handling and marketing division and the farm supplies division.

The grain-handling and marketing division operated approximately 300 grain elevators in the Midwest. This division represented approximately 75 percent of total company revenues, although total revenues had declined by 20 percent from the previous year due to drought conditions that had affected farm crop production. Over the previous five years, the company had invested heavily in upgrading its elevator system to improve throughput and increase capacity in key regions.

The farm supplies division sold crop-protection products, equipment and supplies, fertilizer, and seed through its network of country elevators and approximately 30 marketing centers. Revenues for this division had doubled over the previous five years as part of a strategy to tap the company's country elevator network to diversify its revenue base.

Iowa Elevators had a past reputation for steady financial performance and profitability. However, the company had seen a steady decline in profitability over the previous three years. In the most recent fiscal year, it experienced a loss of $11 million after taxes and a sharp decline in working capital. Management attributed its disappointing results to lower volumes in its grain-handling and marketing division and increased competition. Despite its rising market share, operating margins at the farm supplies division had remained flat.

Concern over the financial performance of the company led to a decision by the board of directors to make changes to the executive team. In February, Walter Lettridge, a veteran of the grain-handling industry, was brought in as the new president and CEO. Shortly afterward, Jose Sousa joined Iowa Elevators as the new chief financial officer. Both Walter and Jose had worked together at a competitor of Iowa Elevators.

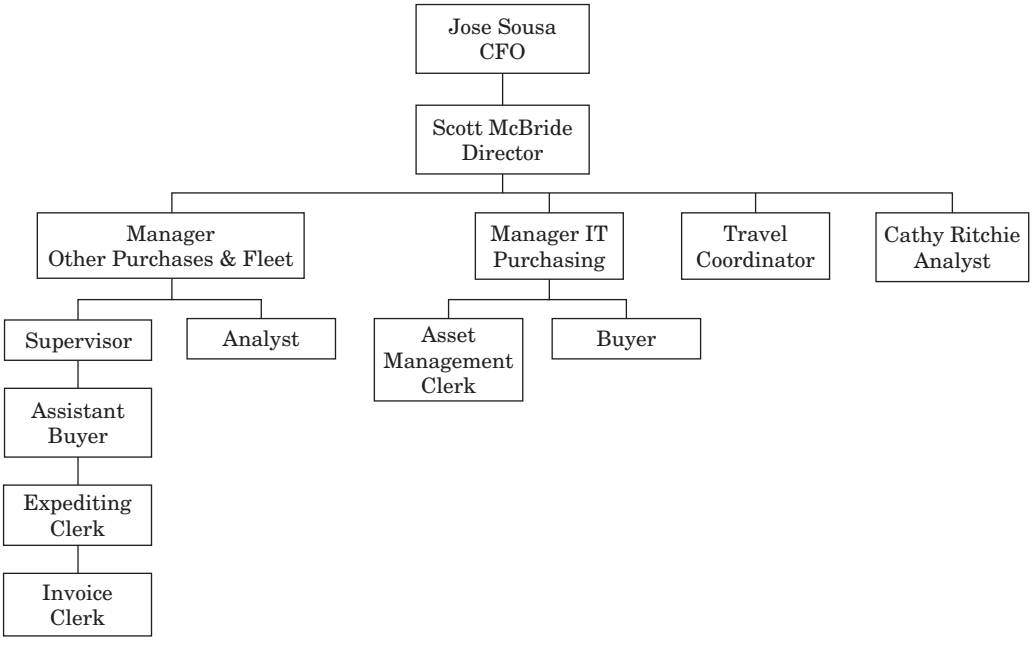
Immediately after joining the company, Walter went to work creating a major cost-cutting initiative, which would include reductions in headcounts, capital expenditure budgets, and overhead expenses. As part of this process, Scott McBride was asked to present a five-year plan to the executive management team, including annual cost reduction targets.

PURCHASING AND SUPPLY MANAGEMENT

Scott supervised a group of 11 people (see Exhibit 1) who were responsible for the acquisition of requirements for head office and some regional sales and administrative offices. Its major purchases were information technology (hardware and software); printing for forms, brochures, and advertising; office supplies; and company automobile leases. The only change in the purchasing organization within the last year had been the addition of a travel coordinator as a result of a contract for air travel and car rentals. The purchasing organization was part of the corporate services organization, which also included the human resources and information technology groups, and reported to the CFO.

Iowa Elevators had a history of decentralized management, with individual divisions held accountable for their own operations and bottom-line performance. As a result, local elevator managers acted autonomously but were responsible for local market share and profitability. In addition, the elevator managers also made decisions concerning the amount and variety of crop-protection products, fertilizer, and seed stock to handle in their retail

EXHIBIT 1 **Iowa Elevators Purchasing Department**



operation. Purchases for elevator operations were handled locally and monitored based on spending limits set in annual operating budgets.

The farm supplies division had a group of four product managers who were responsible for the three main product segments (crop-protection products, equipment and supplies, and fertilizer and seed). These individuals were responsible for supplier selection, product mix, branding, and promotion and assisted elevator and marketing center managers in the areas of promotion, new product development, and inventory planning.

ANALYSIS OF CORPORATE SPEND

In a meeting in early May, Scott was asked by Walter Lettridge and Jose Sousa to present his five-year plan for the purchasing department at an executive management team meeting on June 11. Walter had scheduled time for a number of senior managers to present their plans and ideas aimed at returning the company to profitability. During the meeting, Walter commented to Scott: "I expect purchasing to deliver cost savings and your group needs to play a more significant role in the company. You need to explain what you can deliver and explain how you intend to accomplish your objectives. As far as I am concerned, everything is on the table right now. We need to return the company to profitability and I am not afraid to make some major changes in terms of how we run this business."

Recognizing the need to present a thorough plan, Scott enlisted the support of his analyst, Cathy Ritchie, to help him collect and organize data. The data collection focused on two questions: (1) How much money did Iowa Elevators spend with its outside suppliers? and (2) How much inventory did the company carry? The data collection process had been complicated by the variety of management systems at different levels and at different locations. Scott believed that if more time had been available, Cathy might have been able to capture more spend and inventory data.

Cathy's analysis identified a total corporate spend of $728 million. Although the company dealt with more than 1,500 suppliers, 20 suppliers accounted for approximately 45 percent of the total spend and the top five represented 35 percent. (The top five suppliers consisted of two railway companies and three suppliers to the farm supplies division for crop protection and fertilizer.) She estimated that average annual inventories in the farm supplies division were nearly $120 million with annual purchases of $310 million. A summary of Cathy's key findings is reported in Exhibits 2 and 3.

EXHIBIT 2
Total Purchases by Category ($000)

Spend Category	Annual Spend*
Farm supplies	$ 254,406
Information technology and telecommunications	17,187
Fees, levies, memberships	26,301
Energy	8,602
Financial services and interest expense	24,461
Fleet	4,229
Insurance	5,239
Packaging	10,551
Professional services	7,708
MRO & construction	127,829
Transportation services	208,927
Travel and entertainment	3,557
Other	17,350
Miscellaneous and unclassified	11,926
Total	$ 728,273

* Data for the most recent fiscal year.

EXHIBIT 3
Farm Supplies Division Inventory ($000)

Category	Average Inventory	Annual Purchases
Crop protection products	$ 65,098	$ 124,696
Equipment and supplies	22,388	13,743
Fertilizer	20,938	130,557
Seed	10,389	41,787
Total	$ 118,813	$ 310,783

THE MIS PROPOSAL

Scott was aware that the MIS Group had been asked to make a similar presentation to the executive management team. The chief information officer (CIO) had informed Scott that he would be requesting $10 million in additional spending beyond standard upgrades over the next five years with anticipated cost savings of about $500,000 per year.

PREPARATION FOR THE MEETING

Scott viewed the upcoming meeting as an opportunity to redefine the role of purchasing at Iowa Elevators. His session with executive management was expected to last approximately 90 minutes, and he wanted to prepare a five-year plan with specific objectives for each year, including cost reduction targets. In particular, his plan for the coming year had to be very specific and include identifiable projects and initiatives, schedules, project plans, and expected costs and benefits.

As part of his proposal, Scott also wanted to establish a budget and human resource requirements that would be needed to support his recommendations. While he regarded his staff as competent, Scott recognized that he would require new managerial resources if the role of corporate purchasing was to be expanded. Consequently, he also planned on proposing a new organization structure and establishing a headcount plan and budget for the purchasing department.

As Scott reviewed Cathy's report, he began considering where he was going to start and what could be accomplished. His major concern would be resistance from the divisions and field elevator managers, and he wondered what, if anything, could be done to address any organizational resistance to his recommendations.

Case 3–2
Lambert-Martin Automotive Systems Inc.

Arthur Thomas, vice president of global purchasing, Engine Systems Group at Lambert-Martin Automotive Systems Inc. (Lambert-Martin), was preparing for the biggest challenge of his career. Bill McLaren, president and CEO, had asked Arthur the previous day to take over as the company's new chief purchasing officer (CPO), replacing Jeff Trudell, who was retiring in two months, after eight years in the role. As a first step, Bill asked Arthur to put together some ideas regarding potential changes to the purchasing organization at Lambert-Martin. During their meeting, Bill commented, "Our business plan calls for the company to grow from $10 billion in sales this year to $15 billion in five years. It is essential that we take advantage of opportunities in our supply chain to support our growth objectives and to keep costs in line."

Bill suggested that Arthur review the current organization structure, develop alternatives, and meet with the group vice presidents to solicit their input. It was Tuesday November 6, and Arthur was scheduled to meet with Bill at the end of the month to review his preliminary ideas and recommendations.

LAMBERT-MARTIN AUTOMOTIVE SYSTEMS INC.

Lambert-Martin was a U.S.-based supplier to the global automotive industry, with headquarters in Troy, Michigan. Its origins dated back to the early days of the automotive industry, when the company was formed in 1924 with the merger of Lambert Clutch and Gear Company and Martin

Engine Systems. It was a recognized leader in drivetrain technology, providing innovative products that improved fuel economy, emissions, and performance. Its main product lines were drivetrain components, including transmission control units, engine valve components, friction materials, and turbochargers. With 70 manufacturing facilities across 22 countries, it provided components to most major original equipment manufacturers.

The company invested heavily in product engineering and new product development. Its engineers worked closely with customers on new vehicle programs, and the Lambert-Martin Technology Center, also located in Troy, was a source of new product innovation.

Lambert-Martin operated under a decentralized model with five business groups: Engine Systems, Emission Products, Ignition Technology, Engine Cooling Systems and Transmission Technology. Corporate office functions included accounting and finance, human resources, engineering, information technology, legal, and a small purchasing staff. Group vice presidents operated autonomously with control over sales and manufacturing operations, including purchasing.

The largest group by sales was Transmission Technology, with annual revenues of approximately $3 billion, while annual revenues at the other four groups ranged from $1.5 to $2.0 billion. For the most recent fiscal year, cost of sales represented 80 percent of revenues, while purchases were 50 percent; and selling, general, and administrative expenses were 9 percent. Net earnings after tax were $690 million.

The Purchasing Organization

Most purchasing staff were located in the five business groups, each with a vice president of purchasing that reported directly to their respective group vice president. The group purchasing functions were responsible for commodity strategies, sourcing, quality control, cost reductions, and supplier development. The corporate purchasing group managed the supplier technology portal, supplier scorecards, risk management reporting, and the supplier manual. Historically, the CPO had a dual role as vice president of purchasing for one of the groups as well as responsibility for the corporate purchasing organization. For example, Jeff Trudell had the title of vice president global supply for the Transmission Technology Group as well as being the company's CPO. Similarly, in his new role, Arthur would maintain his current position as vice president of global purchasing, Engine Systems Group, and add the corporate CPO title.

PREPARING FOR THE MEETINGS

Arthur Thomas was a mechanical engineer with 20 years of experience in the automotive parts industry. He joined Lambert-Martin 15 years prior, originally working in engineering and product management in the Emission Products Group. After five years in engineering, Arthur was asked to join the purchasing organization in Engine Systems, where he held positions as strategic sourcing manager, director of supplier development, and director of commodity management before being promoted to his current role, which he had held for the last three years.

As vice president of global purchasing for the Engine Systems Group, Arthur reported to Bill McLaren, who, until his recent promotion, had been group vice president of Engine Systems. During his tenure as head of purchasing for the group, Arthur could see where Lambert-Martin's decentralized purchasing organizational structure constrained the company from capturing important opportunities in its supply chain. Specifically, the lack of communication among the purchasing organizations in the business groups meant that spend information for common suppliers was not shared, thereby potentially missing opportunities for price reductions through consolidation of purchases. Secondly, Arthur felt that because purchasing in each of the groups had separate organizations for sourcing, quality control, and supplier development, it would be possible to reduce overhead costs and improve the effectiveness of these activities through increased centralization.

Arthur had recently read a focus study report prepared by CAPS Research, *Supply's Organizational Roles and Responsibilities,* which indicated that approximately 10 percent of the large companies in the survey had decentralized purchasing organizational structures, and the majority—approximately two-thirds—used the hybrid structure. With a new CEO who was looking for opportunities to make positive changes at the company, Arthur thought this would be a good time to take a fresh look at Lambert-Martin's purchasing organizational structure and the roles and responsibilities of the groups and head office functions. His meetings with the five group vice presidents were scheduled for mid-November. As he sat at his desk, Arthur wondered what questions he should ask during these meetings. Buy-in from the group vice presidents would be essential if any major changes were to occur. Furthermore, Bill McLaren was expecting some alternatives from Arthur regarding where he saw opportunities and how the purchasing function would be able to make a greater contribution to the strategic and financial goals of Lambert-Martin.

Chapter **Four**

Supply Processes and Technology

Chapter Outline

The Supply Management Process
- *Strategy and Goal Alignment*
- *Ensuring Process Compliance*
- *Information Flows*
- *Steps in the Supply Process*

1. Recognition of Need
2. Description of Need
   - *Purposes and Flow of a Requisition*
   - *Types of Requisitions*
   - *Early Supply and Supplier Involvement*
3. Identification of Potential Sources
   - *Issue an RFx*
4. Supplier Selection and Determination of Terms
5. Preparation and Placement of the Purchase Order
6. Follow-Up and Expediting
   - *Assess Costs and Benefits*
7. Receipt and Inspection
   - *Eliminate or Reduce Inspection*
8. Invoice Clearing and Payment
   - *Aligning Supply and Accounts Payable*
   - *Cash Discounts and Late Invoices*
9. Maintenance of Records and Relationships
   - *Linking Data to Decisions*
   - *Manage Supplier Relationships*

Improving Process Efficiency and Effectiveness
- *A Supply Process Flowchart*
- *Strategic Spend*
- *Nonstrategic Spend*

Information Systems and the Supply Process
- *Benefits of Information Systems Technology*
- *ERP Systems*
- *Cloud Computing and the Supply Chain*
- *Electronic Procurement Systems*
- *Electronic or Online Catalogs*
- *EDI*
- *Marketplaces*
- *Online Reverse Auctions*
- *Radio Frequency Identification (RFID)*

Implications for Supply

Policy and Procedure Manual

Conclusion

Questions for Review and Discussion

References

Cases
- *4–1 Qmont Mining*
- *4–2 Eastern Pharmaceuticals Ltd.*
- *4–3 Portland Bus Company*

Key Questions for the Supply Decision Maker

Should we

- Use an e-procurement system to improve the efficiency of the supply process?
- Use online reverse auctions to buy goods and services?
- Consider establishing a supplier-managed inventory program for MRO requirements?

How can we

- Handle lower-value purchases more efficiently?
- Streamline the process so that supply managers are more involved in the earlier stages?
- Communicate more effectively with our internal business partners?

Identifying and streamlining key business processes to reduce costs, grow revenues, and manage assets represents an opportunity in most organizations. Critical processes are embedded in all areas of the organization, including new product development, supply, operations, marketing, sales, and accounts payable. Managing these processes, understanding what makes each process efficient and effective, and clarifying how each process interacts with other processes and activities are critical to the success of the organization as a whole. Understanding how and when to apply information technology solutions to business processes is also an ongoing challenge.

Purchases can represent 50–70 percent of costs for manufacturing organizations and 30–40 percent for service firms. While this indicates the importance of supply in procuring a significant portion of organizational resources, it also suggests the challenges of designing an efficient and effective process for a diverse spend. Ultimately, however, the simplest definition of supply is the exchange of money (the buyer's responsibility) for goods and services (the supplier's responsibility).

The first key decision is: Which process or processes will be most effective and efficient to support this exchange? The options for managing the information flows of a supply process have expanded along with supply management's range of responsibilities. The nature of the requirement will dictate the information exchanges between the purchaser and supplier. Is the purchase one-time or repetitive? How are volumes, specifications, and shipping schedules communicated? Are the purchases part of a short-term or long-term contract? How will prices be established and how will payment be made?

The acquisition process is closely tied to almost all other business processes and also to the external environment, creating a need for complete information systems and cross-functional cooperation. For example, supply must work with engineering to determine specifications, operations to determine production schedules, and finance to arrange payment. In the past 30 years, there have been remarkable advancements in information technology used in the recording, transmission, analysis, and reporting of information within organizations and their supply chain networks.

Most people recognize the strategic importance of information and knowledge management. They also recognize that technology provides tools that can improve efficiency and effectiveness when applied appropriately to a business process. The Internet and availability of integrated systems, such as enterprise resource planning (ERP) software, have had a substantial impact on the acquisition process and its management. Supply managers need to stay abreast of technological developments and be able to assess the fit of each new tool with the organization's goals and strategy. Thus, the second key decision is: What information systems might be used to support or enable efficient and effective processes?

This chapter focuses, first, on the critical steps of a robust supply management process, one with structure and discipline. Once the basic supply process is understood, tools and techniques are addressed that might improve the efficiency and effectiveness of the entire process or specific categories of spend. If the process itself is flawed, then a process improvement program must be undertaken before the process is automated. Remember, process first and technology last.

THE SUPPLY MANAGEMENT PROCESS

A process is a set of activities that has a beginning and an end, occurs in a specific sequence, and has inputs and outputs. The supply management process starts with need recognition and ends with monitoring suppliers and relationships. The steps include: recognize and describe need, identify potential sources, select source(s), determine price and terms, follow up and expedite, receive, pay invoice, and monitor.

A process-oriented person considers the flow of information, materials, services, and capital throughout the process no matter how many functions or departments touch it. A functionally oriented person only considers the steps for which his or her department is responsible. If supply personnel are not involved until potential sources are identified, they and the internal business partner may miss the opportunity for supply and suppliers to add value in the need recognition and description stages. Waste is driven into the process in the forms of unnecessary costs, long cycle times, and missed opportunities because the buying organization, operating out of *functional silos,* manages the process sequentially rather than simultaneously.

Five major reasons for developing a robust supply process are as follows:

1. Large number of items.
2. Large dollar volume involved.
3. Need for an audit trail.
4. Severe consequences of poor performance.
5. Potential contribution to effective organizational operations inherent in the function.

Strategy and Goal Alignment

The first step in optimizing the supply process is building internal consensus around the opportunities to add value to the organization. The focus is: Where, when, and how can supply contribute to short- and long-term goals and strategies of the organization?

Vertical and horizontal alignment of strategy and goals is required for supply to fully contribute to the organization. Vertically, if the supply strategy at the functional or business

unit level is out of sync with organizational strategy, then supply decisions will hinder rather than assist with the achievement of organizational goals (see Chapter 2).

Horizontal alignment between and among functional areas is also required. For example, to attain profitability targets, the finance group's cash flow goals may lead to a payment policy that conflicts with the supply group's goal to contribute to profitability through long-term partnerships with key suppliers in which payment terms were a key negotiating point. Personnel at all levels must work to align strategies and goals vertically and horizontally to maximize organizational opportunities.

Individuals from many functions play valuable roles in a successful acquisition process. The users and specifiers of the good or service (supply's internal customers or internal business partners) play a role in recognizing and describing the need. They are usually the budget owners and the primary information sources for technical descriptions; volume requirements; and quality, delivery, and service targets.

How and when internal users communicate with supply varies. Sometimes internal customers hand off information to supply once they have clearly defined the requirement. Other times, supply personnel bring market intelligence such as supply availability, price trends, or new technology to the need recognition and description stages. When value can be created in the early stages of the process, the internal business partners and supply should interact early and often in cross-functional sourcing teams, new product or service design teams, and commodity management teams (see Chapter 3).

Often, however, supply takes the lead role in analyzing and selecting the supplier(s) and determining price and other terms and conditions such as payment, delivery, quality and service. Other functional areas may step in as well. For example, operations, logistics, warehousing, shipping and receiving, legal, marketing, information systems, engineering, and accounts payable all play a role in the process, but are typically part of different functional areas with a different reporting line than supply.

Each stakeholder has goals and objectives relative to the purchase. When these conflict, the total cost of owning, consuming, and disposing of a purchase may increase unnecessarily. Because of this risk, many senior managers foster a process orientation through cross-functional teams, and by creating shared or common goals, objectives, and metrics.

Ensuring Process Compliance

Increasing the rate of internal compliance with the supply process can be challenging. Often nonsupply staff make unauthorized buying decisions (sometimes referred to as "maverick buying") that lead to higher total cost of ownership and undermine supply's credibility internally and externally. The root causes of noncompliance must be identified and eliminated.

Organizational structure affects process compliance. In a highly decentralized organization where supply decisions are made at the business unit, plant, or division level, supply councils composed of site leaders may be beneficial. The council works to standardize goods, services, and processes across sites; aggregate requirements and leverage volume for lower prices; simplify and streamline the materials management process; formulate annual business plans; and establish objectives for supply. Without a supply council and willing participation by site supply leaders, the organization may have multiple suppliers of the same goods and services with disparate prices, terms and conditions and varying levels of quality and service. Even in a highly centralized organization there may be high levels of noncompliance. Process improvements and consistent delivery of results to internal business partners may increase compliance.

Organizational culture also influences process compliance. A mandate from top management to use the supply process can stop or reduce maverick buying in some organizational cultures. In others, mandates mean little and supply personnel must persuade and convince users to comply.

Information systems may compel compliance by eliminating alternative purchasing paths, reducing process cycle time, and instilling confidence in users that delays will be minimal.

Information Flows

There are four basic information flows involving supply.

Inward Flows (1) Information from within the organization is sent to supply, including statements of need for materials and services. (2) Information from external sources is sent to supply. This may come from suppliers (e.g., prices, and deliveries) or from other sources (e.g., general market conditions and import duties).

Outward Flows (1) Information from within supply is sent to others within the organization. This includes supplier pricing, market conditions, and supply forecasts for cash flow budgeting. (2) Information, such as requests for quotes or proposals, is sent from supply to external sources (e.g., suppliers).

Supply must be able to manage effectively information flows involving both internal and external partners in the supply chain. Information systems enable the efficient flow of information and support effective decision making. These tools are discussed later in this chapter.

Steps in the Supply Process

The supply process is basically a communications process. Determining what needs to be communicated, to whom, and in what format and time frame is at the heart of an efficient and effective supply management process. It is essential for supply professionals to determine when, where, and how they can add value and when, where, and how they can extricate themselves from steps that are best left to other people or to technology.

The essential steps in the supply process are:

1. Recognition of need.
2. Description of need.
3. Identification and analysis of possible sources of supply.
4. Supplier selection and determination of terms.
5. Preparation and placement of purchase order.
6. Follow-up and/or expediting the order.
7. Receipt and inspection.
8. Invoice clearing and payment.
9. Maintenance of records and relationships.

1. RECOGNITION OF NEED

A purchase originates when a person or a system identifies a definite need in the organization—what, how much, and when it is needed.

The supply department helps anticipate the needs of using departments. Supply policy and practice may encourage or require the use of standardized items, provide procedures

for special or unusual orders, and limit the use of rush orders. Also, since the supply department tracks price trends and general market conditions, placing forward orders may be essential to protect against shortage of supply or increased prices. Supply should inform users of the normal lead time and any major changes for all standard purchased items.

Since the greatest opportunity to affect value is when needs are recognized and described (product or service conception and design), the supply manager and supplier can contribute more in these steps than later in the acquisition process. (See Chapter 6 for additional information on value creation.) Early supply and supplier involvement, often as members of new product development teams, provides information that may lead to cost avoidance or reduction, faster time to market, and greater competitiveness. As discussed in Chapter 3, many organizations are turning to cross-functional teams to bring different functional areas, and suppliers, into the process as early as possible.

2. DESCRIPTION OF NEED

The purchaser must know exactly what the internal customers want. And internal requirements should be driven by a clear understanding of the external customer's needs. It is essential to have an accurate description of the need, whether it is a tangible good, a service, or goods and services bundled together. Unclear or ambiguous descriptions, or overspecified materials, services, or quality levels will lead to unnecessary costs. Supply management and the user, or the cross-functional sourcing team, share responsibility for accurately describing the item or service needed.

Purposes and Flow of a Requisition

A requisition is the document used to communicate needs internally between users/specifiers and supply management according to established internal controls. The flow of the requisition is determined by who needs access to the information to perform their duties, the need for an audit trail, and evidence of proper authorization.

A requisition is a gatekeeping tool to manage the flow of information through three gates: (1) authority, (2) internal clarity, and (3) internal clearance.

Gate 1: Authority Does the requisitioner have the authority to make the specified request—goods or services—and at the specified budget level? The supply department establishes who has the power to requisition, prevents unauthorized requisitions, and communicates to suppliers that a requisition is not an order.

Gate 2: Internal Clarity Is the need described in a clear and unambiguous way? Uniform terms or standardized commodity or service codes should be used to describe required articles or services. The importance of proper nomenclature or commodity coding cannot be overemphasized. The most effective way to secure this uniformity is to maintain a database of common purchased items. A coding structure that standardizes purchases brings order and consistency and supports an efficient and effective process. A general catalog lists all the items used, and a stores catalog lists all items carried in stock. Depending on the technological sophistication of the organization, catalogs may be in an

electronic file, on e-catalogs, or hard copy. Difficulties arise when supplier codes (manufacturers or service providers), industry codes, and company codes are different. While software is available to cleanse data and apply standard coding schemas, these tools are not perfect.

If adequately planned and properly maintained, coding schemas promote uniformity in description, reduce the number of odd sizes or grades of articles requisitioned, and facilitate accounting and inventory procedures. If poorly planned, maintained, or used, they may be confusing and expensive beyond their projected benefits. Convincing internal users that a standard item will suffice is an ongoing challenge for supply personnel.

Typically only one item is included on a purchase requisition, particularly for standard items. For special items not regularly stocked, several items may be covered by one requisition if for the same delivery date. This simplifies recordkeeping, since specific items are secured from different suppliers, call for different delivery dates, and require separate purchase orders and treatment.

Gate 3: Internal Clearance Descriptions should be reviewed before preparing documentation to communicate externally with potential suppliers. Quantity, based on anticipated needs, should be compared to economical quantities. The delivery date should allow time to secure quotations and samples, if necessary, and to execute the purchase order and obtain delivery. The requisitioner should be notified if there is a time or delivery constraint that drives in additional expense. Consistent lack of adequate lead time is an indicator of a process problem that must be analyzed and resolved.

This review may be performed by a buyer or a team or it may be system generated. In an ERP or e-procurement system, preloaded data establish decision rules for requisitioning, order points, and suppliers and include triggers to send red flags for buyer review. It is management by exception. Humans are flagged when the system detects a problem based on thresholds set by decision makers.

For lower-value and lower-risk purchases, the buyer should question a specification if a modification would deliver more value. For example, the buyer might recommend a substitute if there are market shortages or lower-priced or better alternatives. A high degree of interaction between the buyer and the user is required in the early stages of need definition because of the impact of future market conditions. At best, an inaccurate description may result in loss of time; at worst it may have serious financial consequences and cause disruption of supply, hard feelings internally, lost opportunity for a product or service improvement, and loss of supplier respect and trust.

Types of Requisitions

There are several types of purchase requisitions, including standard requisitions, traveling requisitions, a bill of materials, and stores/inventory requisition.

Standard Requisition The following information should be included on a standard requisition:

1. Date.
2. Number (identification).
3. Originating department.
4. Account to be charged.

5. Complete description of material or service desired and quantity.
6. Date material or service needed.
7. Any special shipping or service-delivery instructions.
8. Signature of authorized requisitioner.

Electronic requisitions typically have prefilled fields for standard or recurring information. Some organizations include fields for "suggested supplier" and "suggested price."

Traveling Requisition People have always adopted and adapted new technology to business processes. The traveling requisition was an innovation used for recurring requirements and standard parts to reduce operating expenses. In a manual system, the traveling requisition is a form on cardstock that contains a complete description of the item. The requisitioner sends the card to supply, indicating quantity and date needed. Supply enters the supplier, price, and purchase order (PO) number on the traveler and sends it back to the requisitioner, who files the card until the next reorder.

The process of determining which items are appropriate for use on a traveling requisition and the flow of the information are useful when transitioning to an electronic system.

Bill of Materials A bill of materials (BOM) simplifies the requisitioning process for frequently needed line items in organizations that make a standard item over a relatively long period of time.

A BOM includes all materials and parts, including allowance for scrap, to make one end unit: for example, a two-slice toaster. Production scheduling notifies supply of the quantity (e.g., 18,000) scheduled for production next month. Supply "explodes" the BOM by multiplying through by 18,000 to determine the total quantity of material needed for next month's production. Comparison of these numbers with inventory yields the open-to-buy figures. A materials requirement planning (MRP) or enterprise resource planning (ERP) system is preloaded with pricing information on suppliers with long-term agreements, and order releases are generated to cover the open-to-buy amounts. (Chapter 8 provides more detail on MRP.)

Stores/Inventory Requisition Needs may be met by a material requisition from inventory or the transfer of surplus stock from another department or division.

Early Supply and Supplier Involvement

For purchases that are of strategic or critical value to the buying organization, it is usually advisable to manage the process through a cross-functional sourcing team (see Chapter 3). For lower-value purchases, the buyer should question a specification if it appears that the organization might be served better through a modification. For example, the buyer might recommend a substitute if there are market shortages of the desired commodity or lower-priced or better alternatives are available. Since future market conditions play such a vital role, it makes sense to have a high degree of interaction between the supply and specifying groups in the early stages of need definition. At best, an inaccurate description may result in some loss of time; at worst it may have serious financial consequences and cause disruption of supply, hard feelings internally, lost opportunity for a product or service improvement, and loss of supplier respect and trust.

3. IDENTIFICATION OF POTENTIAL SOURCES

Supplier selection constitutes an important part of the supply function. It involves (1) identifying potential qualified sources and (2) assessing the probability that a purchase agreement would result in on-time delivery of satisfactory product/service with appropriate before and after sale service at lowest total cost of ownership. Supplier selection is discussed in detail in Chapter 12, "Supplier Selection." This section addresses the tools available to communicate with potential suppliers.

Issue an RFx

When items are not covered by a contract, the buyer has four options for communicating with potential suppliers: (1) Issue a request for information (RFI)—an optional step that is *not* a solicitation for business. The three options for soliciting business are: (1) request for quotation (RFQ), (2) request for proposal (RFP), or (3) request or invitation for bid (RFB or IFB).

There are no commonly accepted definitions of these terms, so it is important for buyers to communicate clearly to potential suppliers the analysis and selection process. Often each solicitation tool signifies a level of complexity of the purchase, dollar value, and degree of risk the supplier bears.

Request for Information (RFI)

An RFI is issued to gather information about potential suppliers' products and services. Even though the Internet enables fairly quick and easy searches, many supply organizations still prepare and send (electronically or by mail) RFIs to suppliers. An RFI is *not* a solicitation for business or an offer to do business. As the name suggests, an RFI is for information-gathering purposes only.

Request for Quotation (RFQ)

Typically, an RFQ is issued when there is a clear and unambiguous description of the need: for example, a grade of material, a stock-keeping unit (SKU), or other commonly accepted terminology. An RFQ is basically a price comparison tool for commonly used commodities sold in an open and free market where quotations can be easily obtained.

The RFQ is a standard requisition form that includes a list of potential suppliers. It is prepared, checked, signed, and transmitted electronically (e-procurement system, e-mail, or fax) or mailed to potential suppliers. Quotations are recorded, the buyer selects a supplier(s), typically on the basis of price, and a purchase order is prepared and placed with the chosen supplier.

Request for Proposal (RFP)

An RFP is used for more complex requirements in which price is only one of several key decision factors. Typically the buyer is planning to negotiate price and terms. An RFP includes a detailed description of the requirement and invites bidders to use their expertise to develop and propose one or more solutions. The Northeastern Hospital case in Chapter 13 provides an example of an organization using an RFP and the process used to evaluate proposals.

Request for Bid

A request or invitation for bid is used in a competitive bid process with or without the opportunity to negotiate after bid receipt. A detailed bid specification package, similar to an RFP, is developed. It is important to communicate to suppliers how the final selection will take place. Will this be a sealed competitive bid in which the contract will be awarded based on the lowest bid? Will the bids be the starting point from which negotiations will take place?

4. SUPPLIER SELECTION AND DETERMINATION OF TERMS

Analysis and selection of the supplier lead to order placement. Applicable tools range from a simple bid analysis form to complex negotiations. Supplier selection methods are discussed in Chapter 12; issues related to quality are covered in Chapter 7, quantity and inventory in Chapter 8, delivery in Chapter 9, and pricing in Chapter 10.

5. PREPARATION AND PLACEMENT OF THE PURCHASE ORDER

A purchase order is used unless the supplier's sales agreement or a release against a blanket order is used instead. Failure to use the proper contract form may result in serious legal complications or improper documentation. Even where an order is placed by telephone, a confirming written order should follow. In no instance—unless it is for minor purchases from petty cash—should materials be bought without proper documentation.

All companies have purchase order forms. In practice, however, all purchases are not governed by the conditions stipulated on the purchase order. Many are governed by the sales agreement submitted by the seller. Every company seeks to protect itself as completely as possible. Responsibilities that the purchase order form assigns to the supplier are often transferred to the buyer in the sales agreement. Therefore, management is anxious to use its own sales agreement when selling its products and services, and its own purchase order form when buying. Chapter 15 discusses the legal implications.

Format

Purchase order format and routing varies. The essential requirements are the serial number, date of issue, name and address of the supplier, the quantity and description, date of delivery, shipping directions, price, terms of payment, and conditions governing the order.

The conditions might include:

1. Indemnification clause—to guard the buyer from damage suits caused by patent infringement.
2. Price provisions, such as "If the price is not stated on this order, material must not be billed at a price higher than last paid without notice to us and our acceptance thereof."
3. A clause stating that no charges will be allowed for boxing, crating, or drayage.
4. Stipulation that the acceptance of the materials is contingent on inspection and quality.
5. A requirement, in case of rejection, that the seller receive a new order before replacement is made.

6. A precise description of quality requirements and the method of quality assurance/control.
7. Provision for cancellation of the order if deliveries are not received on the date specified in the order.
8. A statement that the buyer refuses to accept drafts drawn against the buyer.
9. Quantity provisions for overshipments or undershipments.
10. Special interest provisions—for example, arbitration or the disposition of tooling.

Routing

While a discussion about routing may seem unnecessary in the age of electronic processes, it is important to understand the flow of information. Who needs access to purchase order information, and why? How information is made available, on paper documentation or electronically, is a matter of process design and organizational capability.

Externally, the supplier needs the information on a PO. Giving or sending a purchase order does not constitute a contract until it has been accepted. Typically, the supplier sends an acknowledgment to confirm acceptance of the order and to complete the contract. What constitutes mutual consent and the acceptance of an offer is primarily a legal question (See Chapter 15). Without an acknowledgement, the buyer can only assume that delivery will be made by the requested date. When delivery dates are uncertain, the buyer needs definite information in advance to plan operations effectively.

Internally, the supply department requires access (electronically or hard copy), accounts payable for the payment process, and receiving and/or stores to plan for and confirm receipt and incoming inspection if required.

Blanket and Open-End Purchase Orders

Blanket or open-end purchase orders reduce costs by reducing the number of purchase orders issued. A blanket order usually covers a variety of items. An open-end order allows for addition of items and/or extension of time. Blanket orders are used to buy maintenance, repair, and operations (MRO) items and production-line requirements used in volume and purchased repetitively over a period of months.

The original purchase order contains all negotiated terms and conditions for estimated quantities over a period of time. Subsequently, releases of specific quantities are made against the order. Releases may be executed by supply or, more efficiently, by production scheduling directly to the supplier. An open-end order may remain in effect for a year, or until changes in design, material specification, or conditions affecting price or delivery necessitate renegotiations.

Master Service Agreement (MSA)

A master service agreement is an agreement wherein the supplier(s) provides predetermined services over a specified period of time with total costs not to exceed an amount previously agreed upon. The scope of work for each function or level of service is fully defined and agreed upon before the period of performance starts. Costs are generally fixed for the period of performance and usually have a "not to exceed" value. MSAs are usually awarded for periods of one year or longer.

6. FOLLOW-UP AND EXPEDITING

After issuing a PO, the buyer may follow up and/or expedite the order.

Follow-up is routine order tracking to ensure the supplier can meet delivery promises. An appropriate follow-up date is indicated with the order. Progress inquiries may be made by phone, e-mail, fax, or in-person. Early notification of problems such as production scheduling, quality, or delivery enables appropriate action. Follow-up on strategic or critical spend, especially large-dollar and/or long lead-time buys, may be about advance shipping notices (ASNs) or percentage of the production process completed as of a certain date. Follow-up may not occur on lower-value purchases or it may be built into the electronic supply system whereby buyers are only notified of exceptions.

Responsibility for follow-up with a services supplier may be placed in the user department to help ensure user compliance with prior commitments and deadlines. Follow-up on internal commitments may become a joint responsibility for the supply manager as well as the supplier. Extensive user interface with supplier personnel before and during service delivery also affects other aspects of services contract administration. For example, if a service is performed on-site after hours, security check-in sheets and access systems may be used to verify work patterns or area activity. Periodic site visits and a walk-through of the facility with the supplier's representative may lead to a better understanding of user needs. Some form of benchmarking against other providers may also be useful.

Figure 4–1 shows an example of a follow-up form.

Expediting is the application of pressure on a supplier to meet the original delivery promise, to deliver ahead of schedule, or to speed up delivery of a delayed order. Threats of order cancellation or loss of future business may be used. Expediting should be necessary on only a small percentage of the POs issued. If the buyer has done a good job of analyzing supplier capabilities, only reliable suppliers—ones who will perform according to the purchase agreement—will be selected.

Frequently, expediting is caused by poor planning inside the buying organization and may indicate the need for internal process improvements. If material requirements planning is adequate, the buyer should not need to ask a supplier to move up the delivery date except in unusual situations. Of course, in times of severe scarcity, the expediting activity assumes greater importance.

Assess Costs and Benefits

One of the costs of doing business with a supplier (and vice versa) is the cost associated with follow-up and expediting. One form of risk assessment and mitigation is matching the degree and type of follow-up with the spend category strategy (typically based on the importance of the purchase to the organization).

Follow-up and expediting that cost more than the value added is a form of process waste. It should be captured and included in the total cost of ownership assessment. Expediting may be a prime target for root cause analysis and a reduction or elimination plan. Often, the analysis reveals that the need for expediting is driven by decisions made in the buying organization, not by the supplier, and internal change is needed.

FIGURE 4–1
Follow-Up Form

Source: Arizona Public Service Company.

aps.

PURCHASE ORDER FOLLOW-UP
(Please Rush Reply)
PURCHASING DEPARTMENT • P.O. BOX 21666 • PHOENIX, ARIZONA 85036

Date _____
This is our _____ Request
Please Answer Immediately

REPLY TO ITEMS CHECKED BELOW BY
❑ This Form ❑ Wire ❑ Phone

Our Purchase Order No.	Request for Quotation No.	Your Invoice No.	Date	Amount	Your Reference

- ☐ 1. RUSH SHIPMENT. ADVISE EARLIEST DATE.
- ☐ 2. WHEN WILL SHIPMENT BE MADE? IF SHIPPED. ADVISE METHOD.
- ☐ 3. PLEASE TRACE SHIPMENT.
- ☐ 4. IF SHIPMENT HAS BEEN MADE, MAIL INVOICE, TODAY.
- ☐ 5. PLEASE MAIL RECEIPTED FREIGHT BILL.
- ☐ 6. WHY DID YOU NOT SHIP AS PROMISED? ADVISE WHEN YOU WILL SHIP.
- ☐ 7. WILL YOU SHIP ON DATE SHOWN ON PURCHASE ORDER?
- ☐ 8. RELEASE SHIPMENTS AS SHOWN UNDER REMARKS.
- ☐ 9. PLEASE MAIL US ACCEPTANCE COPY OR OUR PURCHASE ORDER.
- ☐ 10. PLEASE ACKNOWLEDGE OUR ORDER.
- ☐ 11. PLEASE MAKE YOUR SHIPPING DATE MORE SPECIFIC.
- ☐ 12. WHEN WILL BALANCE OF ORDER BE SHIPPED.
- ☐ 13. WHEN WILL PRICES BE SUBMITTED? PLEASE RUSH.
- ☐ 14. PLEASE MAIL SHIPPING NOTICE.
- ☐ 15. PLEASE INDICATE OUR PURCHASE ORDER NUMBER ON PAPERS REFERRED TO OR ATTACHED.
- ☐ 16. WE HAVE NO RECORD OF TRANSACTION COVERED BY INVOICE. ADVISE DATE OF SHIPMENT, NAME OF PERSON PLACING ORDER AND FURNISH SIGNED DELIVERY RECEIPT COPY.
- ☐ 17. INVOICE RETURNED HEREWITH.
- ☐ 18. INVOICE IS REQUIRED IN _____ COPIES.
- ☐ 19. PRICE OR DISCOUNT IS NOT IN ACCORDANCE WITH QUOTATION.
- ☐ 20. TERMS ON INVOICE ARE NOT IN ACCORDANCE WITH THE PURCHASE ORDER.
- ☐ 21. ENCLOSED INVOICE SENT TO US IN ERROR.
- ☐ 22. DIFFERENCE IN QUANTITY.
- ☐ 23. UNIT PRICE INCORRECT.
- ☐ 24. EXTENSION INCORRECT.
- ☐ 25. PURCHASE ORDER NO. LACKING OR INCORRECT.
- ☐ 26. SALES TAX DOES NOT APPLY – See reverse side of Purchase Order.
- ☐ 27. SHOULD BE BILLED F.O.B. DESTINATION.
- ☐ 28. HAVE YOU CONSIDERED THIS ORDER COMPLETE?
- ☐ 29. _____

Reply: _____

Vendor
By _____

Purchasing
By _____

510-00J

SEND WHITE AND PINK COPIES WITH CARBON INTACT. WHITE COPY IS RETURNED WITH REPLY.

7. RECEIPT AND INSPECTION

The proper receipt of goods and services is of vital importance. Many smaller and single-site organizations have centralized receiving in one department. Often receiving reports to supply management (see Chapter 16). If just-in-time inventory management systems have been implemented, materials from certified suppliers or supplier partners bypass receiving and inspection and are delivered directly to the point of use. (See Chapter 8.) Receiving also may be bypassed for small-value purchases.

The prime purposes of receiving are to:

1. Confirm that the order placed has actually arrived.
2. Check that the shipment arrived in good condition.
3. Ensure the quantity ordered has been received.
4. Forward the shipment to its proper destination (storage, inspection, or use).
5. Ensure that proper documentation of the receipt is registered and accessible to appropriate parties.

Shortages may occur because material has been lost in transit, short-shipped, tampered with, or damaged in transit. Physical counts can be forced by blocking receiving from access to the quantity ordered. If accurate amounts are entered into the system, the order is closed out, inventory records updated, and the invoice cleared for accounts payable to authorize payment.

Eliminate or Reduce Inspection

One goal of supply management is to ensure that quality is built in internally during the design stage and externally in the suppliers' processes. This reduces or eliminates incoming inspection. (See Chapter 7, "Quality"; Chapter 9, "Delivery"; and Chapter 13, "Supplier Evaluation and Relations.")

In a just-in-time (JIT) environment, production parts go right from the receiving dock to production. This is only possible when the supplier is capable of achieving the right level of quality consistently and the carrier is capable of meeting the delivery windows consistently. When quality is not assured, incoming inspection is required. Damage may also occur during transit, which has implications for carrier inspection and logistics processes. Decisions must be made about the need for inspection, the appropriate type of inspection, and the most cost-efficient and effective method of inspection.

8. INVOICE CLEARING AND PAYMENT

An invoice is a claim against the buying organization. Typically it shows order number and itemized price. Invoice clearance procedures are not uniform. Checks and audits of invoices are established based on cost-benefit analysis. The cost of a person's time to resolve minor variances may exceed the value of the variance. A decision rule may be used that stipulates payment of the invoice as submitted, as long as the difference is within prescribed limits: for example, plus or minus 5 percent or $25, whichever is smaller. Accounts payable tracks variances to identify suppliers that are intentionally short-shipping.

Payment for services may vary somewhat from payment for goods. Some services require prepayment, such as an eminent speaker; some, immediately upon delivery, such as hospitality services, whereas others can be delayed, such as telephone services. It may be difficult for small suppliers to offer extended payment terms, and early payment may generate price or other concessions. Progress payments are usual for large contracts spread over time, whereas regular payments are appropriate for ongoing services such as building maintenance or food service.

Supply or accounting may be responsible for clearing invoices (see Chapter 16). If assigned to accounting, supply is relieved of a nonvalue-adding task, accounting tasks are concentrated in a single function, and a check and balance is established between the commitment to buy and payment. If assigned to supply, immediate action can be taken because supply placed the original order.

When the invoice is handled by accounting in a paper-based process, the following procedure is typical:

1. Duplicate invoices are mailed directly to the accounts payable (AP) department. AP time-stamps, checks for accuracy, and certifies for payment except where the purchase order and the invoice differ. AP files one copy; one is returned with payment.

2. Invoices at variance with the purchase order on price, terms, or other features are referred to supply for approval.

If information is missing or does not agree with the purchase order, the invoice is returned to the supplier for correction. Ordinarily, the buyer insists that discounts (see Chapter 10) be computed from the receipt of the corrected invoice, not from the date originally received.

If a purchase order is canceled and cancellation charges are paid, supply provides accounting with a "change notice" that defines the payment before approval.

If supply clears invoices, the procedure is:

1. After review and adjustments for corrections, the original invoice is forwarded to accounting to be held until supply authorizes payment. The duplicate invoice is retained by supply.
2. When the receiving report is sent to supply, it is checked against the invoice. If the two agree, supply keeps both documents until it receives assurance from inspection that the goods are acceptable.
3. Supply then forwards its duplicate copy of the invoice and the receiving report to accounting, where the original copy of the invoice is already on file. Accounting issues payment.

The three-way match of data from the purchase order, the invoice, and receiving also occurs in an electronic procurement system.

Aligning Supply and Accounts Payable

Often, payment terms are not met. The root causes of late payment are typically either slow cycle time in the accounts payable process or conflict between finance and supply policy. Slow cycle time can occur because of errors on the invoice, paper-based processes, inefficient mailroom processes at the buying organization, and limited human resources in the mailroom, accounting, and/or supply. Information systems and electronic fund transfers may help address these problems by shortening the cycle time.

Lack of alignment causes conflict between supply and accounting. Supply views suppliers as valuable contributors to the organization's success. Living up to the terms and conditions of the contract is one indicator of the commitment to performance of both parties. When buyers negotiate payment terms and their organization fails to live up to those terms, this should be seen as a serious breach by all functional representatives.

Accounting views cash management as a primary contributor to the organization's success. Paying accounts as late as possible allows the buying organization the use of its money for a longer period of time. The perspective on suppliers may be that they are expendable and easily replaceable.

Management may put accounts payable and supply into one department to force goal alignment through structure and reporting relationship. Or accounts payable and supply may serve on a joint team to resolve inconsistencies and align processes. The Ross Wood case in Chapter 16 illustrates how changing the accounts payable process and combining accounts payable and supply can improve process efficiency and effectiveness.

Cash Discounts and Late Invoices

Sometimes suppliers are slow to invoice, and supply must request the invoice. Or suppliers request payment prior to the receipt of material or services. When invoices provide for cash

discounts, should you pay the invoice within the discount period, even though the material may not actually have been received, or do you withhold payment until the material arrives, even at the risk of losing cash discounts?

The arguments for withholding payment of the invoice until after the goods have arrived are:

1. Frequently the invoice does not reach the buyer until late in the discount period or after it, if the supplier fails to invoice promptly.
2. It is poor practice to pay without an opportunity for inspection. Legally, the title to the goods may not pass to the buyer until acceptance of them.
3. Commonly, invoices are dated on the shipment date. The buyer should state that the discount period runs from the later of either the date of goods receipt or invoice date.

The arguments for clearing the invoice for payment without awaiting the arrival, inspection, and acceptance of the material are:

1. The financial consideration from discounts may be substantial.
2. Failure to take the cash discounts reflects unfavorably on the credit standing of the buyer.
3. With reputable suppliers, mutually satisfactory adjustments will be made easily.

9. MAINTENANCE OF RECORDS AND RELATIONSHIPS

The final step is to update records, including supplier performance scorecards. Electronic files or hard copies of the order-related documents are stored or filed. Law, accounting standards, company policy, and judgment determine which records are to be kept and for how long. For example, a purchase order is evidence of a contract. It may be retained much longer (normally seven years) than the requisition, which is an internal memorandum.

The basic records to be maintained, either manually or electronically, are:

1. PO log, which identifies all POs by number and indicates the open or closed status of each.
2. PO file, containing a copy of all POs, filed numerically.
3. Commodity file, showing all purchases of each major commodity or item (date, supplier, quantity, price, PO number).
4. Supplier history file, showing all purchases placed with major suppliers.
5. Outstanding contracts against which orders are placed as required.
6. A commodity classification of items purchased.
7. A database of suppliers.

Additional record files may include:

1. Labor contracts, giving the status of union contracts (expiration dates) for all major suppliers.
2. Tool and die record showing tooling purchased, useful life (or production quantity), usage history, price, ownership, and location. This may prevent paying more than once for the same tooling.

3. Minority and small business purchases, showing dollar purchases from each.
4. Bid-award history, showing which suppliers were asked to bid, amounts bid, number of no bids, and successful bidder, by major items. This may highlight supplier bid patterns and possible collusion.

Linking Data to Decisions

Data are collected throughout the supply management process. Turning data into usable knowledge is a continuing challenge. From a process perspective, it is important to understand what decisions need to be made; what information is relevant; where it can be found; and how the information will be captured, analyzed, and disseminated to decision makers.

Often the problem is information overload that leads to "analysis paralysis," rather than a lack of information holding up a decision. Electronic tools designed to enable better decisions though information management are discussed later in this chapter. Supplier metrics are discussed in Chapter 13.

Manage Supplier Relationships

Internal and external relationships are affected throughout the supply process. They may be initiated, developed, damaged, repaired, or ended. Relationships with key supply chain stakeholders internally and externally should be developed and assessed throughout the process. See Chapter 13, "Supplier Evaluation and Relations."

IMPROVING PROCESS EFFICIENCY AND EFFECTIVENESS

Once the basic information flows and communication techniques that comprise the supply management process are understood, we return to the initial questions: (1) What process(es) will be most effective and efficient to support the buyer–supplier exchange? (2) What information systems might be used to support or enable efficient and effective processes?

A Supply Process Flowchart

The flowchart in Figure 4–2 demonstrates one way an organization might improve efficiency and effectiveness of the supply management process. This begins with an assessment of the nature of the spend. Is the purchase strategic?

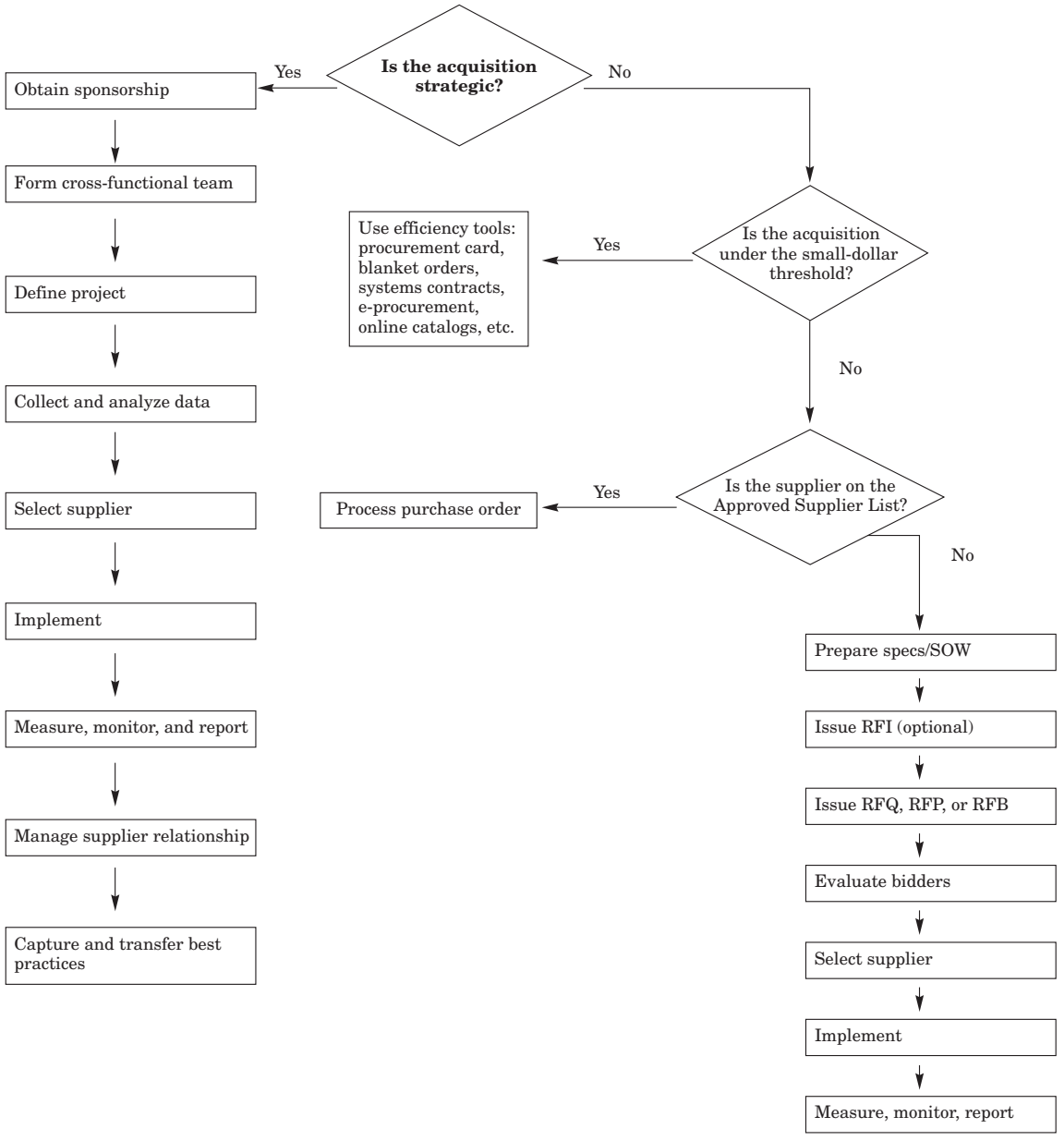
Strategic Spend

A common definition of strategic spend is goods or services critical to the mission of the organization. This definition allows for high- and low-dollar-value purchases. How can the supply process for strategic spend be made more efficient (get more things done in a set amount of time) and more effective (get more of the right things done)? And what is the trade-off between efficiency and effectiveness?

Early Supply and Supplier Involvement

As the flowchart depicts, a cross-functional sourcing team fosters communication throughout the process, especially during the critical stages of need recognition and description. It makes sense to apply time, money, people and other resources to mission-critical spend. The goals are to assure continuous availability at the lowest total cost of ownership. Information management tools enable this communication process and support decision

FIGURE 4–2 **A Supply Process Flowchart**



making. If a trade-off must be made, typically, effectiveness is favored over efficiency in strategic spend management.

Nonstrategic Spend

For nonstrategic (nonmission-critical) purchases (the right column of the flowchart), dollar value and repetitiveness drive process decisions. First, a small dollar threshold is

established and efficiency tools, especially electronic ones, are used. Second, suppliers are prequalified and tools for efficient order placement are used.

Efficiency relates to the number of tasks performed in a set amount of time. For nonstrategic spend, efficiencies are gained by reducing the number of requisitions coming into the supply department, the number of purchase orders issued to suppliers, and the number of invoices and payments processed. Two continual problem areas for supply managers, small value purchases and rush orders, are largely resolved through the use of efficiency tools.

Small Value Orders

A Pareto analysis of annual spend usually reveals that roughly 70 to 80 percent of transactions account for only 10 to 15 percent of spend. These are C items, typically, maintenance, repair, and operating supplies (MRO), with low average transaction amounts. For some goods and services that fall into this category it might be possible that the costs of processing the order and delivering the goods or services may be greater than the value of the purchase. The process cost to transact a $50 purchase may be as much as a $5,000 one. The goal is to minimize the acquisition costs (the process costs not the price) of nonstrategic spend while assuring availability.

The problem of small monetary value orders is resolved by simplifying or automating the process or consolidating purchases to reduce the acquisition cycle time (time from need recognition to payment), reduce administrative cost, and free up the buyer's time for higher-value or more critical purchases. A few examples follow:

1. Vendor/supplier-managed inventory (VMI/SMI), stockless buying, or systems contracting can be used. This is typical for MRO items. (See explanation earlier in this chapter.)
2. A procurement card (also called a purchasing card or a P-card) is a credit card that is provided to internal customers to purchase directly from established suppliers. (See discussion in next section.)
3. Supply sets up blanket orders against which internal customers issue release orders; suppliers provide summary billing.
4. An electronic procurement or an electronic data interchange (EDI) system is used. Ordering and reordering occur automatically based on preestablished reorder points.
5. In reverse auctions, the buyer prequalifies suppliers and invites them to an online auction during which bidders submit bids and the buyer awards a contract for the predefined items for a set period of time.
6. Authority levels and bidding practices are adjusted, and an e-procurement system, telephone, or e-mail is used for ordering.
7. Integrated suppliers are used to provide a variety of supplies.
8. Low-value order placement is outsourced to third parties.
9. Persuasion may be employed to increase the number of standardized items requested.
10. Small requisitions are held until a reasonable total, in dollars, has been accumulated.
11. Specific supplies or type of supplier is assigned to a requisition calendar so that all requests are received on the same day.
12. Invoice-less payments (self-billing) are arranged.

13. Users place orders directly with suppliers.
14. A blank check purchase order is issued in which a signed, blank check is sent along with the PO. The supplier ships the full order, completes the check, and deposits it. This reduces paperwork (receiving reports, inventory entries, and payments), saves postage, often enables a larger cash discount, and saves time in accounts payable.
15. Outsource responsibility for small-value purchases to a third-party purchasing services provider. For example, some firms prefer to use third-party firms to handle their plant stores' operations for MRO components.

Reducing the Number of Requisitions Marked Rush or Emergency

Frequently, an excessive number of requisitions are marked "rush." Emergencies, such as style or design changes, equipment breakdowns, and unexpected changes in market conditions, may justify a rush order.

However, some "rush" orders cannot be justified. These include requisitions caused by: (1) faulty inventory control, (2) poor production planning or budgeting, (3) lack of confidence in the ability of the supply department to get material to the user by the proper time, and (4) the sheer habit of marking requests "rush." Unnecessary costs occur because of errors from working under pressure and the impact on price to compensate the supplier for the added burden (real or perceived) of a rush order.

Education and process improvements may reduce the problem. Supply must educate users about the proper supply procedure and enlist the support of other functions to gain compliance. For example, the requisitioner has to secure approval from the general manager and any extra costs that can be calculated are charged back.

Improvements in process efficiency increase the credibility of the process and the supply group. These include preapproved suppliers, purchasing cards, electronic catalogs, and e-procurement systems that reduce lead and cycle time and allow users to issue requests directly to a supplier against an existing contract.

Corporate Purchasing Cards

Corporate purchasing cards (also called procurement cards or P-cards) are credit cards issued to internal customers (users) in the buying organization to purchase low-dollar-value, high-volume goods and services. P-cards reduce administrative costs (for people, system use and third-party providers) by reducing the number of purchase orders generated and processed and by shortening the process cycle time for authorizing, tracking, purchasing, reconciling, and reporting purchases. P-card use supports other process initiatives such as consolidating spend and suppliers. They can be merged with technology to be electronic commerce compatible and data sensitive to capture information that is integrated into an ERP system.

Holders of the card are given dollar limits and lists of preferred suppliers with whom supply has already negotiated prices and terms. P-cards automate many aspects of the system, thereby eliminating purchase orders and individual invoices and ensuring suppliers of fast payment, two or three days versus 30+ in a typical system. By moving the transaction activities to the user department, the supply cycle time and transaction costs are reduced. Also, buyers (and accounts payable) are freed from the day-to-day transactions for small-value purchases and can focus on higher-value purchases and issues.

The General Services Administration (GSA) found that purchases under $2,500 accounted for approximately 2 percent of total federal government spending, but represented

85 percent of total procurement transaction volume. Implementation of purchasing cards to handle low-value purchases generated estimated savings of $54 to $92 per transaction while simultaneously reducing the time required to process paperwork transactions by two to six weeks.[1]

The primary perceived risk of P-cards is loss of control. Card issuers have instituted controls that (1) determine, at the point of sale, if the purchase meets preset dollar limits per card; (2) limit the number of transactions per day; (3) limit the value of a single transaction; (4) determine if it is an approved supplier; and (5) limit purchases to specific commodities. By establishing daily and monthly querying and reporting, the administrator manages by exception rather than focusing on monthly statement details.

The most sophisticated card programs are able to (1) track and report sales tax information for audit purposes, (2) track and prepare 1099 forms for unincorporated service providers, (3) identify whether the supplier is a minority business owner, (4) capture specific product information, (5) identify which cost center should be charged for the purchase, and (6) include different types of purchases, including travel and entertainment expenses and fleet expenses.

Supplier- or Vendor-Managed Inventory (SMI/VMI), Stockless Buying, or Systems Contracting

Supplier- or vendor-managed inventory (SMI/VMI), systems contracting, or stockless buying are a more sophisticated merging of the ordering and inventory functions than blanket contracts.

Systems Contracting

Systems contracts rely on periodic billing procedures, allow nonsupply personnel to issue order releases, employ special catalogs, and require suppliers to maintain minimum inventory levels. Normally, the volume of contract items is not specified. These systems improve inventory turnover rates.

This technique is used most frequently in buying repetitive items such as office supplies and maintenance, repair, and operating supplies (MRO). MRO supplies are many types of items, all of comparatively low value and needed immediately when any kind of a plant or equipment failure occurs. The technique is built around a blanket-type contract that is developed in great detail regarding approximate quantities to be used in specified time periods, prices, provisions for adjusting prices, procedures to be followed for daily requisitioning and delivery within a short time (normally 24 hours), simplified billing procedures, and a complete catalog (often online) of all items covered by the contract.

In an electronic procurement system, the buyer or requisitioner communicates electronically each item and quantity required. If there are large-volume requirements from a specific supplier, the supplier stores items in the customer's plant as though it were the supplier's warehouse. The buyer's contact with the supplier is electronic. The system works as follows:

1. The buyer places the blanket order for a family of items, such as fasteners, at firm prices.
2. The supplier delivers predetermined quantities to the inventory area set aside in the buyer's plant. The items are still owned by the supplier.
3. The buyer sometimes inspects the items when they are delivered.
4. The computer directs storage to the appropriate bin or shelf.

[1]R. J. Palmer, M. Gupta, and R. Dawson, "U.S. Government Use of Card Technology," Defense Acquisition University (July 2010), www.dau.mil.

5. The buyer places POs electronically, thus relieving the supplier's inventory records.
6. Pick sheets are prepared and the items are picked from the supplier's inventory.
7. The supplier submits a single invoice monthly for all items picked.
8. The buyer's accounting department makes a single monthly payment.
9. A summary report is electronically generated, at predetermined intervals, showing the items and quantity used for the buyer's and supplier's analysis, planning, and restocking.

Systems contracting is used in service organizations as well as manufacturing and for high-dollar-volume commodities as well as MRO supplies. The shorter cycle time from requisition to delivery leads to substantial inventory reductions and greater compliance with the supply process. The amount of red tape or bureaucracy is minimal. Since the user normally provides a good estimate of requirements and compensates the supplier in case the forecast is not good, the supplier risks little in inventory investment. The degree of cooperation and information exchange required between buyer and supplier often results in stronger relationships than normally exhibited in a traditional arm's-length trading situation.

Vendor- or Supplier-Managed Inventory (VMI or SMI)

In VMI systems, the supplier is responsible for maintaining the buying organization's inventory levels. The supplier has access to inventory levels (often electronically) and generates purchase orders. Typically, the supplier manages the buyer's inventory at the buyer's location.

The supplier pulls stock, packs, ships, and invoices. This procedure reduces process cycle time by reducing the number of people/functions touching the process. These systems are tools for managing small orders. VMI may also be used for consignment inventory wherein payment is made after inventory is used.

Large retailers, such as Walmart, use VMI systems with their key suppliers such as Procter & Gamble. In these arrangements, stock at Walmart's distribution centers is owned by the supplier and invoices are issued when the goods are shipped to a store. EDI is used to handle inventory reconciliation and invoicing.

INFORMATION SYSTEMS AND THE SUPPLY PROCESS

Information systems include interconnected components that collect, process, and store raw data and distribute information to support decision making, control, and coordination within the organization. While information systems can be manual (paper based), most information systems rely on information technology infrastructure, consisting of hardware and software, to operate.

Information system technology allows organizations to be connected with important partners in their supply chain networks. Capabilities to exchange reliable information with these partners quickly and cost effectively is essential for the improvement of supply chain performance.

There are a number of technology tools available to improve process efficiency and effectiveness. These tools enable process effectiveness in two ways: (1) They make data more transparent, accurate, and accessible to decision makers, and (2) they relieve supply decision makers of lower-value-adding tasks, allowing them to focus on higher-value-adding tasks, spend categories, and internal (other functional areas, top management) and external

(suppliers) relationships. Also, the development of decision support and knowledge management systems enables more sophisticated modeling and facilitates more complex decisions involving multiple variables.

To determine which information systems might be used to support or enable efficient and effective processes, it is important to understand (1) the benefits of the technology, (2) the technology options that provide these benefits, and (3) the trade-offs in costs and benefits when choosing technology.

This section covers information systems in a supply context, and addresses the following: ERP systems, cloud computing, e-procurement, online catalogs, electronic data interchange (EDI), marketplaces, online reverse auctions, and radio frequency identification (RFID).

Benefits of Information Systems Technology

Information system technology can provide seven important benefits to the organization:

Cost reduction and efficiency gains. These can be achieved by streamlining the supply processes and freeing up supply staff to do more value-adding work.

Data accessibility. Quick and easy access to critical data in real time aids sound decision making, makes it easier to identify supply problems earlier, and provides useful information for negotiations.

Speedier communication. Faster communication improves supply chain effectiveness and efficiency, especially with global suppliers. Faster turnaround may increase market share and lower inventories.

Dedicate resources to strategic issues. More resources (e.g., staff and budgets) can be spent on strategic supply initiatives, and strategic and critical suppliers and projects because less time is spent on administrative and tactical supply activities.

Data accuracy. Automation decreases errors, especially data entry errors. Benefits include lower inventories (safety stock) and stockouts, lower expediting costs, and improved customer satisfaction.

Systems integration. Integration across departments, suppliers, and customers can provide accurate information on a timely basis to assist with production and materials planning and decision making.

Monetary control. Enterprise systems can provide control over how and where money is spent.

ERP Systems

Enterprise resource planning (ERP) systems refer to a type of computer software that contains a suite of applications that integrate various functions within the organization (e.g., operations, supply, marketing, and accounting/finance) and facilitates the connection to supply chain stakeholders, such as suppliers and customers. Using a common data management system, ERP systems allow users to share information across departments, and in some cases across the supply chain, in real time. An additional advantage of ERP is that it eliminates dispersed organizational information systems, thereby reducing opportunities for errors in transaction processes.

ERP represents an extension of standalone MRP (materials requirements planning and later materials resource planning) systems that became popular in the late 1980s and 1990s

and focused originally on manufacturing firms (see Chapter 8 for a detailed coverage of MRP). Today, ERP systems are used by firms in the manufacturing, services, governmental, and nonprofit sectors. While SAP AG and Oracle are the largest providers of ERP software, there are a large number of small ERP solutions suppliers, typically targeting specific industry sectors.

Most organizations have supply chain management modules as part of their ERP systems. These can include purchasing, forecasting and planning, order tracking, shipping and receiving, scheduling, and inventory management.

The cost of ERP systems and implementation can be expensive and disruptive to the organization. For large organizations, total costs can run in the tens of millions of dollars, take several years, and involve hundreds of consultants and project managers. Many small and medium-sized enterprises (SMEs) cannot afford the capital outlay of ERP software and may instead adopt cloud-based systems that offer the cost advantage of pay-as-you-go fees as opposed to up-front capital costs (see the following section on cloud computing).

Business processes used to support company legacy systems can evolve over time and become inefficient. Implementation of ERP systems requires evaluation of and changes to business processes. As with most projects, poor preparation is a leading cause of failure, so proper understanding of how processes are currently used and the changes required is the essential starting point for ERP system implementation. This can be particularly challenging in a decentralized organization that may have very different processes and policies. Reviewing business processes as part of an ERP implementation project represents an opportunity to improve process efficiency and standardize and align processes across the organization.

The significant costs and effort required to implement ERP systems are justified on the basis of eliminating the costs of maintaining legacy systems; operating efficiencies in areas such as inventory control and customer service levels as a result of systems integration; improved visibility, and the ability to make decisions quickly using real-time information; standardization of processes and policies (e.g., product coding); improved order tracking; and access to a common database that can be used for analytics.

Adopting ERP systems also comes with potential disadvantages beyond cost and organizational effort to implement and train employees on the new system. It is difficult to customize ERP systems, and companies may have to change or forego unique processes. Once firms commit to an ERP system, switching costs are high. Fees to support the system and upgrade costs can be expensive and, where possible, should be negotiated at the outset. Lastly, the anticipated benefits can be overestimated, extending the payback on the investment.

Cloud Computing and the Supply Chain

It is common for organizations to install new software applications layered over existing legacy systems. For supply, examples include procurement, inventory management, transportation, and forecasting systems provided by companies such as Descartes, JDA, and Manhattan Associates. Cloud solutions provide access to software applications, in some cases working on top of legacy systems, which provides the advantages of cost-effectiveness and flexibility.

The National Institute of Standards and Technology (NIST) defines cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort

or service provider interaction."[2] Cloud computing can be private (operated for a single organization, managed internally or by a third party), public (operated over a network for general public use), community (operated for specific organizations, managed internally or by a third party), or hybrid (some combination of private, community, and/or public). Individuals are exposed to cloud applications in their personal lives in a variety of common technologies, such as accessing e-mail through Gmail, managing their music library on iTunes, or using some operating systems, such as Microsoft Office 365, on their computers.

There are three main elements of cloud computing important to supply:[3]

Software as a Service (SaaS): Applications that reside in the cloud, which users are able to rent on a pay-for-use basis. SaaS is the largest and most mature part of cloud computing.

Platform as a Service (PaaS): Software development technologies that allow users to create customized processes or tools specific for their needs.

Infrastructure as a Service (IaaS): Shared server capacity that permits the sharing of computing power and storage and that can be accessed as needed on a pay-for-use basis.

Advocates of cloud solutions claim that it provides the advantages of lower costs and increased flexibility. First, IaaS means that the costs of cloud computing are variable, based on a pay-as-you-go model, so organizations are able to avoid expensive capital investments in new systems. Second, PaaS permits implementation of cloud-based systems easier and faster. Proponents of cloud systems claim that new applications can be set up faster, with less ongoing maintenance, permitting allocation of information technology resources to other areas. Third, the interconnectedness of cloud computing provided by SaaS improves transparency and visibility across the end-to-end supply chain. Communication and workflows are more reliable and robust, compared to traditional methods such as e-mail and EDI.

Adaption of cloud-based systems is expected to continue to grow rapidly. Estimates for the market size of cloud technology are $150 to $200 billion by 2020.[4] However, skeptics of cloud computing have raised concerns in the areas of cost, reliability, security, and regulation. Despite claims of the cost advantages of cloud computing, careful analysis is required to understand the fee structure and compare it to the costs of acquiring the application and hosting it internally. Similarly, there are concerns that some cloud applications are not as reliable and managed as well as on-premises infrastructure, resulting in service interruptions. Security is a major issue with most information systems, and the concept of third-party managed infrastructure can be unsettling. Concerns include hackers that can compromise data security, service providers using data without permission, and vulnerability to viruses, worms, and malware. There are a number of regulatory issues, mainly related to data transport and access, especially in cases where data storage and infrastructure are hosted in a foreign country. Government regulations are vague in some areas and are expected to change and evolve. For now, users should get as much clarity as possible about the legal and regulatory issues for their organization before adopting cloud computing.[5]

[2] Reference: http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf, accessed February 27, 2014.

[3] G. Courtin, *Supply Chain and the Future of Applications* (London, U.K.: SCM World, October, 2013).

[4] http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.

[5] A. McAfee, "What Every CEO Needs to Know About the Cloud," *Harvard Business Review* 89, no. 11 (November 2011), pp. 124–132.

Electronic Procurement Systems

E-procurement is an applications software package that allows the requisitioning, authorizing, ordering, receiving, invoicing, and paying for goods and services through the Internet and is frequently a module in the company's ERP system. Firms such as Oracle and SAP dominate the e-procurement market because their software can provide real-time integration with their ERP systems. Because of the costs of acquiring ERP and e-procurement systems, many small and medium-sized enterprises (SMEs) use cloud computing services, enabled by SaaS, to acquire e-procurement capabilities.

Some organizations use e-procurement to automate from requisition-to-order and others from requisition-to-pay. An end-to-end e-procurement system that includes contracts and e-payables in the cycle is referred to as procure-to-pay.

The adoption of an e-procurement system is often driven by existing process inefficiency, low internal compliance, high transaction costs, low spend visibility, and low control over organizational spend. Performance metrics for an e-procurement system often include: (1) the percent of organizational spend under supply's control, (2) requisition-to-order costs, (3) requisition-to-order cycles, and (4) percent of off-contract (maverick) spend. A survey of chief purchasing officers about their use of e-procurement technology found the benefits were: (1) better visibility of what they are spending globally by supplier, region, and commodity, (2) faster, better product development by tapping suppliers as an innovation source, and (3) tighter risk reduction and mitigation.[6]

From the internal user/customer perspective, a successful e-procurement system is one that makes life easier—faster ordering, faster fulfillment, and a broader range of choices. Depending on the policies and procedures implemented, it may be possible to satisfy internal users as well as meet the requirements for internal control, cost savings, and supply base management.

Streamlining the Receiving, Invoicing, and Payment Process

Should the e-procurement system include receiving, invoicing, and payment? A valid question is: Does the organization need to receive an invoice? The invoice provides no new information, yet it costs money to handle.

In an invoiceless system, suppliers are notified that payment, based on the agreed-upon cash discount schedule, will be made in a set number of days from receipt of satisfactory merchandise (and they may specify that payment will be made only after the complete shipment has been received). A system match between the PO, receiving report, and inspection report (if conducted) is made, and a check is generated or funds are electronically transmitted on the receipt date at the agreed-upon payment term. The receiving report must be accurate; the PO fully priced, including taxes and cash discount terms; and purchases must be made FOB destination, since there is no way to enter in freight charges. The PO then is the controlling document.

Commodity Coding Schema

Commodity managers need commodity codes to effectively source, track, and manage spend by category. Users, who want to get to the product quickly and easily, need robust

[6] D. Jones, "Best Practices: Selecting and Implementing ePurchasing Products," Forrester Research (May 22, 2013).

item descriptions that are easily searched. The procurement team must respond to the needs of both stakeholders.

The value of a hierarchical commodity coding schema is the ability to evaluate expenditures according to any level of the hierarchy. If a company, such as an architectural, graphic arts, or printing firm, spends a significant amount on writing utensils and supplies, spend analysis may be at the **class** (ink and lead refills) or **commodity** (pen refills) levels. This reveals opportunities to consolidate suppliers, find better sources, negotiate volume discounts, or optimize the supply chain in some other way. If this spend is insignificant, analysis may be on the higher **family** (office supplies) or **segment** (office equipment, accessories, and supplies) categories only.

The U.N. Standard Products and Services Code (UNSPSC) provides an open, global, multisector standard for efficient, accurate classification of products and services. Some supply managers are dissatisfied because the UNSPSC often does not address specific industries or products at a level of detail required for meaningful commodity spend analysis. Also, it is difficult to make updates in an automated environment. Different divisions of the same organization often assign different UNSPSC codes to the same commodity. To effectively use UNSPSC, all databases within an organization and its supply chain need to use the same version of UNSPSC, support backward compatibility for earlier versions, and keep it updated. Costs can be prohibitive.

Many procurement departments use government-issued, industry-specific, or proprietary code systems that do not directly integrate or embed UNSPSC. Proprietary codes are developed by, and useful to, a single company. Often they are not hierarchical, meaning they lack roll-up and drill-down capabilities for spend analysis. Such coding schemas can be expensive to develop and maintain, and it can be expensive to require trading partners to use the same code.[7]

Electronic or Online Catalogs

An e-catalog or online catalog is a digitized version of a supplier's catalog. It allows buyers to use a web browser to view detailed buying and specifying information about the supplier's products and/or services. Product catalogs include (1) product specification data, and (2) transaction data. Product specification data describe the products and are the same for all buyers. Transaction data (price, shipping and billing addresses, and quantity discounts) are customized to each buyer.

Suppliers have a number of options to digitize their catalogs. The buyer's solutions provider can typically convert the supplier's catalog to a suitable format. Alternatively, the supplier can purchase an out-of-the box software package and make the conversion or purchase the services of the software provider. Or a data aggregator can develop a library of product specifications from a variety of suppliers and license organizations to use the product specifications and assist in developing the transaction data. In a catalog network, a host company collects the catalogs and customizes the transaction data for each buyer. The buyer can either pull the catalogs onto the company server or access them from the host company. Or the supplier may allow the buyer to "punch out" or access a supplier-hosted catalog.

[7] A. E. Flynn, *Catalog Management: Implementation Strategies* (Tempe, AZ: CAPS Research, October 2004).

Supply can create buyer-controlled catalogs that combine information, such as pricing and specifications, from one or multiple suppliers. Simple database software packages permit the creation of such catalogs, and most enterprise resource planning (ERP) systems have features that permit the creation of customized catalogs. The supplier is responsible for updating and maintaining the catalogs.

In-house catalogs permit the user to customize content in terms of supply options and pricing, or to restrict supply options. These catalogs support item standardization and volume purchasing from approved suppliers. The catalog can be integrated into the company's system to streamline the process and track spending patterns.

EDI

EDI has been in existence since the 1960s, but it did not receive widespread attention and adoption until the 1990s. EDI allows computer-to-computer exchange of business documents between two organizations using agreed standards to structure the message data. The sender converts documents from their application format to a standard EDI message format and transmits the message either directly or through a third party. EDI involves B2B transactions only—individual consumers do not use EDI to purchase goods or services. Documents commonly exchanged via EDI include purchase orders, shipping schedules and notifications, and invoices. EDI has been widely adopted in the manufacturing, transportation, and retailing sectors. Companies such as Walmart, General Motors, Home Depot, and Target require supplier compliance with EDI.

EDI provides secure transmission and fast turnaround of large amounts of data; greater accuracy internally and with trading partners; shorter process cycle time that may help to lower inventory, provide electronic logs or audit trails, and reduce administrative costs.

EDI requires the use of standard message formats, which vary depending on industry and method of transmission. The most popular are ANSI X12, which is commonly used in North America, and UN/EDIFACT, which is widely used outside of North America. Certain variations of formats are used in specific industries, such as the Uniform Commercial Standard (UCS) in grocery and retail, and the Voluntary Inter-Industry Commerce Standards (VICS) in consumer packaged goods.

Value-added networks (VANS) are third-party organizations that provide EDI services for a fee. The primary services provided by VANS are transmitting information and providing data storage, similar to e-mail boxes. VANS are frequently used by small and medium-sized organizations that do not have EDI software capability in-house. Companies may also join VANS because of a requirement by one or more trading partners.

Increasingly, EDI transmissions are sent via the Internet, sometimes allowing organizations to bypass VANS, but some organizations still use data transmission lines. Using EDI over the Internet has meant that some firms have adopted AS1 and AS2 protocols that rely on XML, SMTP, and HTTP/HTTPS to send documents as S/MINE attachments, allowing them to bypass VANS.

The established B2B networks and systems provided by EDI, which has become the standard in many industries, means that EDI will continue to play an important role in the foreseeable future. The volume of EDI transactions continues to grow annually and the volume of global EDI transactions is estimated at 20 billion per year. However, firms are expanding the number of B2B communication methods and message formats. B2B marketplaces, described in the following section, provide an alternative to EDI.

Marketplaces

An *extranet* is a private intranet that is extended to authorized users outside the company, such as suppliers, also referred to as *private marketplaces*. Private marketplaces improve supply chain coordination and information sharing with key business partners. Through a web-based interface, suppliers can link into a customer's systems, and vice versa, to perform any number of activities, such as checking inventory levels, tracking the status of invoices, or submitting quotes. Because the information exchange is electronic, supply professionals are freed to spend time on value-added activities rather than entering data or checking the status of shipments or payments. The largest and perhaps most successful example of a private marketplace is Walmart's RetailLink.

Unlike B2C marketplaces such as eBay, Amazon, and Alibaba, public B2B marketplaces that developed in the early 2000s have, for the most part, disappeared or changed their business model. These marketplaces were in two groups: independent and consortia. Examples include FreeMarkets (independent marketplace providing reverse auction services) and Quadrem (consortia marketplace in the mining industry). A handful of public marketplaces have survived, such as the health care marketplace Global Health Exchange (GHX).

In contrast to a private marketplace, an *intranet* is a single and widely accessible (for authorized users only) network set up to share information and communicate with company employees. It is a private, secure internal Internet. Intranets communicate information and facilitate collaboration among employees and are sometimes linked to the company's ERP system. They can be used to display supplier catalogs, provide lists of approved suppliers, and post company supply policies. Supply processes can be enhanced by allowing employees to place orders via web browsers, approve and confirm purchases electronically, and generate POs electronically. The main advantages of supply-based intranets are low transaction costs and reduced lead times.

Online Reverse Auctions

Auctions have been used for commercial transactions for centuries. Generally, auctions are classified on the basis of competition, between sellers or buyers, and forward or descending prices. For example, the Dutch flower auctions are declining-price auctions with competition between buyers, while a traditional English-style auction, involving the sale of equipment or furniture, is a rising-price auction with multiple buyers. These models and the Internet provide new techniques for determining price, quality, volume allocations, and delivery schedules with suppliers.

Internet auction events can be open offer, private offer, posted prices, and reverse auctions.

Open Offer Auctions Suppliers select items, see the most competitive offers from other suppliers, and enter as many offers as they want up until a specified closing time.

Private Offer Auctions The buyer offers a target price and quantity. Suppliers enter offer(s) on select item(s) by a specific time. The buyer evaluates and posts a "status." The status levels are:

Accepted: The supplier is awarded the contract, contingent on final qualification.

Closed: The supplier may no longer submit offers on the item.

BAFO (best and final offer): The supplier may submit one more offer for the item.

Open: Bidding may be continued for as many rounds as necessary to accept or close all items.

Posted Price Auctions The buyer posts the acceptable price; the first supplier to meet it gets the award.

Reverse Auctions

A reverse auction is an online, real-time, dynamic, declining-price auction for goods or services between one buying organization and a group of prequalified suppliers. Suppliers compete by bidding against each other online using specialized software. Suppliers see the status of their bids in real time. The supplier with the lowest bid or lowest total cost bid is usually awarded the business.

When to Use Reverse Auctions

A reverse auction is an alternative sourcing method to RFPs/RFQs, sealed bids, face-to-face negotiations, and spot buys from the commodity markets. At a minimum, the following conditions are required:

1. Clearly defined specifications, including technological, logistical, and commercial requirements.
2. A competitive market with qualified suppliers willing to participate. Typically, at least three suppliers are required. More than six suppliers may add unnecessary costs and complexity.
3. An understanding of the market conditions in order to set appropriate expectations for a reserve price.
4. Buyer and seller familiarity and competency using the auction technology.
5. Clear rules of conduct: for example, conditions for extending auction length and award criteria.
6. The buyer is prepared to switch suppliers if necessary.
7. The buyer believes that the projected savings justify a reverse auction.

Conducting Reverse Auction Events

There are three stages: preparation, the auction event, and implementation and follow-up.

Preparation The purchaser identifies or certifies appropriate suppliers; sets the quality, quantity, delivery, and service requirements and length of contract; trains internal team members and supplier representatives on the auction technology; tests the technology and communicates the process and award criteria.

Event Price visibility can be handled by showing rank order, percentage, or proportional differences. Bid ranks can be adjusted for nonprice factors, such as differences in transportation costs or quality.

Auction rules should be known up-front and strictly followed to foster credibility and encourage future participation. Suppliers must know the length of the auction and the rules for extending the time period. Suppliers and the buyer can typically communicate during

the auction. Messages may or may not be visible to other participants. Technical assistance should also be available.

Implementation and Follow-Up The purchaser announces the results to participants and responds to questions. Negotiation or clarification may occur before the final contract is signed.

The auction leader communicates the outcome internally. For example, accounting needs to know if there is a change of suppliers and/or pricing. Anything that might improve auctions should be documented.

Issues with Reverse Auctions

Potential ethical transgressions on behalf of buyers are:

1. Buyer knowingly accepts bids from suppliers with unreasonably low prices.
2. Buying firm submits phantom bids during the event to increase the competition artificially.
3. Buyer includes unqualified suppliers to increase price competition.

Potential ethical issues involving suppliers are:

1. Supplier collusion.
2. Suppliers bid unrealistically low prices and attempt to renegotiate afterwards.
3. Suppliers "bird watch" or participate in the event but do not bid to collect market intelligence. A rule requiring bids before entering the auction may preclude this behavior.
4. Suppliers submit bids after the auction event in an attempt to secure the business.

Potential Problems with Using Online Auctions[8]

There are a number of problems that might arise. These include:

- The risk of interrupting good supplier relationships.
- The risk of developing a reputation for aggressive price-buying over other considerations.
- The costs of running the auction versus expected savings.
- The cost savings potential of auctions versus sourcing processes such as RFP/RFQ and negotiation.
- Significant up-front preparation and cost required compared to determining price through an RFP/RFQ.
- Actual price when unforeseen costs are factored in versus bid price.

The Portland Bus Company at the end of this chapter provides an example of a company that uses electronic reverse auctions and the implications for making sourcing decisions.

Radio Frequency Identification (RFID)

RFID tags contain a chip and antenna that emit a signal, using energy from a radio frequency reader, which contains information about the container or its individual contents. RFID tags can be passive, active, or battery-assisted passive and vary widely in memory, frequency, power source, and cost. The most common are passive, read-only tags.

RFID technology has many applications in everyday life, such as employee identification badges and highway toll payment devices. Three primary applications of RFID in

[8] P. F. Johnson, "Supply Organizational Structures," CAPS Research, June 2003.

the supply chain are real-time tracking of inventory, product tracking, and transportation. RFID can track the movement of inventory through the supply chain. For example, it can show inventory levels in the warehouse. Several industries use RFID to track product through the manufacturing process. Automotive manufacturers use RFID tags to manage the assembly of cars, coordinating the delivery of the proper components, such as seats and engines, to the assembly line. Transportation service providers use RFID technology to track rolling stock and coordinate maintenance schedules. The potential benefits of RFID in the supply chain include lower costs by the elimination of manual counting and bar coding of incoming and outgoing material; automatic tracking of inventory levels; faster, easier, and more accurate inventory identification and picking; and reduced spoilage through improved stock rotation.

RFID is not without drawbacks. First, it adds another level of information and the firm's information systems must have the capability to capture, process, and analyze the data as they are collected. Problems persist with the ability to capture reliable data collected by the readers. Second, implementation requires investments in information technology and equipment, and support is required from consultants and systems engineers. Although the costs of RFID tags have decreased, they still remain relatively expensive compared to other technology alternatives (e.g., bar codes). As a result, many firms do not feel that adopting the technology provides a reasonable return on investment. Third, concerns have been raised about security during data transmission and privacy issues for consumers.

IMPLICATIONS FOR SUPPLY

When applying technology to the acquisition process, supply professionals still play a critical decision-making role. They provide the investigative and analytical skills to source, evaluate, and select suppliers; the influencing and persuading skills to negotiate the best deal for the organization; and a strategic and long-term planning approach to anticipate and prevent problems down the road. The transactional side is streamlined and responsibility for actually placing orders delegated to the user whenever possible.

With rapidly changing technology, it is difficult to predict what the future will look like. It is, therefore, important to identify the key questions that decision makers in supply management must answer before embarking on an e-commerce path. These include:

1. Should we be a leader or a follower?
2. What should be acquired through e-commerce?
3. What tools should we use to acquire those items?
4. Who should we use as a service provider?

1. *Should we be a leader or a follower?* Management must decide to be an early adopter of new technology or wait to see what emerges as the norm or standard. Early adopters often report that, despite the difficulties encountered, there are advantages to being further along than later adopters. Those who choose to wait tend to believe that the high risks and costs associated with adopting new technology in its infancy far outweighs whatever competitive advantages might be gained. Relevant factors are the organization's risk aversion and success with past technology implementation.

2. *What should be acquired through e-commerce?* Should the organization purchase indirect goods and services, direct requirements, or both through e-commerce tools, strategic or nonstrategic goods and services? Supply managers must consider the characteristics of each category of purchase (see Chapter 6 for a discussion of purchases categories) to determine what might be successfully procured online. This analysis includes consideration of the existing and desired buyer–supplier relationship to ensure that the method of procurement does not adversely harm the relationship.
3. *What tools should we use?* Streamlining tools range from lower technology tools, such as procurement cards, to high-technology tools, such as online reverse auctions, e-catalogs, and integrated e-RFx systems. A decision to adopt e-commerce does not necessarily mean that all the available tools will be adopted. The decision maker must determine the appropriateness of the tool to the type of material or service under consideration, the nature of the buyer-supplier relationship, and the comfort level of the internal stakeholders and the suppliers. Decisions related to the adoption of enterprise systems (e.g., ERP systems) are made by the CEO, usually with input from executive leaders such as the CFO and CIO. Supply operates under the umbrella of the company's management information systems, which can affect the range of e-commerce applications available.
4. *Who should we use as a service provider(s)?* If a third-party service provider is used, such as cloud computing, a careful assessment must be made of the available providers. Several critical technical issues are compatibility with, or ease of migration from, existing software; scalability (can it grow with your needs?); the supplier's technical reputation and experience with supply chain management; and expertise of the staff. Some of the key considerations beyond the technical issues are the long-term viability of the provider, user-friendliness of the software, fee structure, and service and support—offline and online.

POLICY AND PROCEDURE MANUAL

A policy and procedure manual may also contribute to the development of an efficient and effective process. It is a carefully prepared, detailed statement of organization, duties of the various personnel, and procedures and data systems (including illustrative forms used, fully explained). A manual is essential for a well-conceived training program, internal transfers, and communication about the process with nonsupply colleagues. The requirements of the Sarbanes-Oxley Act add greater importance to internal controls, standardized processes, and consistent use.

The preparation process may reveal inconsistencies and discrepancies that lead to process improvements. Careful advance planning of the coverage, emphasis, and arrangement is essential. It should include a clear definition of the purposes of the manual and its uses. Both purpose and use influence length, form, and content. A manual may cover only policy or it may include a description of the organization and some level of description of procedures. Current manuals and sample manuals from other organizations can serve as guides.

Department personnel and internal stakeholders such as design, engineering, marketing, operations, and production should discuss and check the contents for errors and modifications. The manual should reflect the actual policy and procedures, or drive process changes. The manual may be posted on the organization's intranet and/or in loose-leaf form. The chief executive officer may enhance credibility by writing a foreword defining the supply department's authority and endorsing its policy and procedures.

Common topics are authority to requisition; competitive bidding; approved suppliers; supplier contracts and commitments; authority to question specifications; purchases for employees; gifts, blanket purchase orders; confidential data; rush orders; supplier relations; lead times; determination of quantity to buy; over and short allowance procedure; local purchases; capital equipment; personal service purchases; repair service purchases; authority to select suppliers; confirming orders; unpriced purchase orders; documentation for purchase decisions; invoice clearance and payment, invoice discrepancies; freight bills; change orders; samples; returned materials; disposal of scrap and surplus; determination of price paid; small-order procedures; salesperson interviews; and reporting of data.

Conclusion

The supply management process has come under increasing scrutiny because of (1) the unrelenting focus on cost management, and (2) the realization that standardized processes and internal and external integration can lead to competitive advantage. Robust processes are the foundation of a successful supply organization.

As supply managers continue to transition to a more strategic role in many organizations they also will continue to test and apply new technologies to the supply process. The future holds much promise for technology-enabled process improvements. The challenges are great, but those who see the opportunity for cost reductions, faster cycle times, better integration with key supply chain stakeholders, and improved communication flows will continue to seek ways to use these new tools to their best advantage. Information systems and information technology enable a supply organization to contribute efficiently and effectively to organizational goals and strategies. Without structured and disciplined supply processes, technology expenditures may leave the organization with too many tools and not enough integration or utilization.

Questions for Review and Discussion

1. Where in the supply process is there the greatest opportunity to add value and why?
2. What are the steps in a robust supply management process?
3. What contribution to supply efficiency might be effected through the use of (a) an e-procurement system, (b) online catalogs, and (c) online reverse auctions?
4. What approaches, other than the standard supply procedure, might be used to minimize the small-value-order problem?
5. When would you issue an RFQ rather than an RFP and why?
6. What records are needed for efficient operation of the supply function? How can data collection throughout the process help or hurt buyer–supplier relationships?
7. What are the costs and benefits of follow-up and expediting? Are there opportunities to reduce total cost of ownership at this stage of the process?
8. How can an e-procurement system reduce the problem of small orders? Rush orders?
9. When should you use reverse auctions to select a supplier?
10. What arguments would you use to convince a supplier to participate in a reverse auction?
11. How does the use of an e-procurement system change the nature of the skills and knowledge required of supply management personnel?
12. What possible improvements in supply processes could technology offer in the future?

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Case 4–1

Qmont Mining

Alice Winter, working on a summer internship at Qmont Mining, was trying to determine how the supply systems for remote locations could be improved.

QMONT MINING

Qmont Mining, a major metals producer with headquarters in Vancouver, British Columbia, had extensive holdings all over the Canadian North. Supply management had been completely decentralized until very recently. A consulting study had recommended a move to more centralized supply management, including purchasing and logistics. The purchasing and stores manager at Qmont's largest mine in British Columbia, Harry Davidson, had been asked to pursue this idea and to make recommendations on potential improvements.Harry had hired Alice Winter, a college student in logistics, to work as a summer intern to assist him. Harry had said to Alice: "A good project for you to work on is the way we handle supply for remote locations. I suspect that we could do substantially better, but I really don't have any hard data."

REMOTE LOCATIONS

Alice found out that Qmont had 17 remote locations, ranging from three small mines that had a buyer/storekeeper on site to two mine start-ups, nine exploration sites, and three development projects with a distance of 5,000 kilometers (km)[9] between the farthest ones and 300 km between the closest ones. Qmont made a distinction between exploration sites where

[9] 1 km = 0.60 miles.

the potential for ore was totally unproven to development sites where the possibility of mineralization had been proved, but where the extent of mineralization had to be determined. Qmont used its own drilling crews at these two types of sites, although most mining companies preferred to use contract drillers. Qmont managers believed that for security, availability, and cost reasons they needed full control and in-house crews. Typically, at both exploration and development sites an engineer or geologist would be in charge. All supplies for these sites would be flown in by bush planes on floats or by helicopters.

ACCOUNTING INFORMATION

Alice Winter decided to visit the accounting department at Vancouver headquarters first to see what she could learn about supply in remote locations. She found out that accounting paid all invoices from suppliers who claimed to have supplied a remote location even when no confirmation of orders, deliveries, or receipts was available. This occurred in about one-third of all invoices. The accountant explained: "Getting suppliers to provide odd requirements in a hurry and to get bush pilots to fly them in is a constant hassle. The last thing we want to do is lose the goodwill of these suppliers because we don't have our records straight and delay payments."

DEVELOPMENT AND EXPLORATION SITE DATA

Alice did get the chance to review the previous year's actual supplier invoices for three different sites (one development and two exploration) over a four-month summer period. Communication between actual sites and suppliers occurred in two main ways. Since site leaders were in regular contact via satellite with head office personnel in exploration or engineering, they frequently asked the head office contacts to place specific orders for them. In addition, it was common for remote site personnel to contact suppliers directly and place orders. Moreover, when a drill needed a quick replacement part, apparently it was not unusual to place orders with several suppliers at the same time in the hope that at least one would deliver quickly. Drill and crew downtime was seen as very expensive.

The site accounting records showed that the total supply spend for these three sites totaled about $1,850,000. Of this total, approximately:

- $220,000 was for drilling equipment including drill bits and rods.
- $120,000 for MRO suppliers.
- $420,000 for air transport covering seven different suppliers, of which air transport of personnel in and out of sites cost about $170,000.
- $180,000 for fuel.
- $80,000 for food.

Alice uncovered 22 instances of multiple deliveries of the same item within days to the same site from different suppliers and 12 instances of multiple deliveries of the same item from the same supplier within a few days. There were 14 instances where the airfreight bill was at least 10 times higher than the value of the item transported.

NEXT STEPS

After several weeks of gathering this information, Alice wondered what her next steps should be. One option would be to gather similar information for all remote sites to get a more complete picture and to extend the time period. Another would be to get more specific about the details of each order and each supplier. She knew that she would be meeting with Harry Davidson in a few days to discuss her progress and findings to date. She also expected Harry to ask her what she believed she should do next.

Case 4–2

Eastern Pharmaceuticals Ltd.

In the afternoon of September 12, Andrew Baines, assistant purchasing manager at Eastern Pharmaceuticals Ltd. (Eastern), was discussing the purchase of packaging materials and contract filling of tablet samples with a supplier's representative. When the details of the packaging purchase order were finalized, Andrew told the sales representative, John Cao, of Lucas Paper & Box Company (Lucas), that he would send him the purchase order for the packaging components and 25 percent of the contract filling. John replied that Shannon Baily, of the marketing department, had promised him 100 percent of the contract filling. "This is the first I've heard of that," snapped Andrew. "It's not

marketing's responsibility," he continued, controlling his temper, "to decide what percentages of contract filling a particular supplier will get. Purchasing arranges the contract filling with the suppliers that can give the best quality, delivery, and price."

John Cao, an experienced sales representative, remained unperturbed. He replied that he had always dealt with both marketing and purchasing and that sometimes purchasing was not involved at all in the projects. He said that in this case where both marketing and purchasing were involved, he was just keeping purchasing informed of what marketing wanted. Andrew closed the meeting by politely telling John that he would have to clear up the situation between the two departments. He told John that he would let him know how much of the contract packaging Lucas would be getting.

Andrew Baines, his boss Matt Roberts, and a senior buyer made up the total purchasing staff at Eastern. One of Andrew's responsibilities was to handle the purchase of the marketing department's requirements. He also acted as liaison between the department and the production planning, manufacturing, and packaging departments. In recent weeks Andrew was finding the job more and more frustrating.

EASTERN PHARMACEUTICALS

Located in Seattle, Washington, Eastern carried an extensive line of prescription and nonprescription items that were mostly manufactured in its own plant. The company had approximately 15,000 drugstore customers plus hospital and government accounts. Annual sales of close to $150 million were handled by 50 sales representatives from coast to coast. Although the nonprescription items, known as over-the-counter (OTC) products, were promoted directly to the drug stores, most business was generated by convincing the doctors to prescribe Eastern's products for their patients. No selling or advertising was directed at the consumer.

The company's sales strategy was that Eastern sales representatives would give samples to a doctor after getting a verbal promise to prescribe. These samples would be used to start the patient on an Eastern product, and the doctor would write a prescription for the patient to pick up at the drugstore. With a large number of similar products on the market, it was a difficult marketing problem to keep Eastern's brand name in the doctor's mind days or weeks after the sales representative's visit. To help solve this problem, sales representatives asked the doctors to sign forms requesting additional samples at specific intervals.

The sales and marketing department had been recently reorganized, and the two new people, Shannon Bailey, sales promotion manager, and John Slaughter, advertising manager, were understandably anxious to do a good job. Both had made a lot of progress in working with John Cao, standardizing the samples to be used for sales promotions and advertising mailings. Essentially, both samples were now the same; the only difference was that the advertising sample was enclosed in an outer mailer to be sent to the doctor.

THE FILLING CONTRACT

The packaging contract under discussion totaled $88,000. In the past year, Lucas had sold $80,000 worth of materials annually to Eastern. Lucas's annual sales were $32 million.

John Cao had designed an attractive new style of sample. Basically, it was a folded card holding strips of tablets that could be pushed through one at a time, as required by the patient. This one idea was to be used in the near future to sample several other tablet products. John had developed the idea for marketing, expecting that he would get both the printing and contract filling.

Although Eastern did 90 percent of their manufacturing and packaging, they did not have the equipment to heat seal the strip into the folded cards. When goods came in from a contract packager such as Lucas, they were held in inventory until required by marketing.

THE RELATIONSHIP BETWEEN MARKETING AND PURCHASING

While Shannon and John had been able to work well together, they were having their difficulties in getting the cooperation of other departments involved. Frequent instances of sample mailings being late or sales representatives being out of stock continued to plague the success of their program. Delays had been caused by late ordering of components from outside suppliers, shortages of tablets, and mailing lists being incorrectly printed. In their attempts to remedy the situation, Shannon and John had trampled on a few toes. During attempts to investigate the causes for these delays, the vice president of operations discovered that there were usually good reasons offered by the departments involved.

Purchasing, manufacturing, and information systems pointed out that they could not drop their usual work "every time marketing wanted something in a rush." The feeling expressed by the production planner was typical of most department managers: "It is fine to get

out the samples but rather pointless if we are running out of finished product in the meantime. Some of those unusual sample cartons slow down production up to 50 percent."

While it was part of Andrew's job to coordinate marketing's sample requirements, he was not making much progress. His attempts to get each department to cooperate met with the usual arguments that marketing was only one department and had to wait its turn. Shannon and John at times grew impatient with Andrew's efforts, and they started to go directly to each department manager.

Andrew felt that the action taken by Shannon telling the supplier how much contract filling business he would get was the last straw. With this in mind, he went to see Matt Roberts to try to get a policy statement on the matter. Andrew wanted to know where the line was drawn between purchasing's and marketing's responsibility in matters dealing with company suppliers.

Matt explained that, because the marketing promotion expenditure totaled $34 million or 22 percent of sales, Eastern, like most other companies in the industry, faced similar purchasing–marketing problems. If marketing managers were responsible for their budgets, they had the right to spend $1 each for 10,000 items, or if they wanted, they could buy 5,000 items for $2 each and still stay within their budget. It was a marketing decision whether they were getting better results from the $1 or $2 item. For these items, purchasing merely produced a purchase order to confirm the deal already made by marketing with the supplier. The policy applied to nonproduction items, such as calendars, letter openers, diet sheets, patient history cards for doctors, or displays and posters for drugstores. In contrast, production and inventory purchases had last year reached 20 percent of sales revenues.

However, Matt pointed out that final selection of sources for any purchased items that had to be packaged by the plant had always been the responsibility of the purchasing department. In this particular case, there was still a significant inventory of old style samples in the building, which marketing had not considered when they promised John Cao 100 percent of the contract filling. Andrew felt that placing all the contract filling right away would build up the stock of samples unnecessarily. Besides this, he had negotiated a better price from another reliable supplier, Sheppard Packaging, and felt that he would give the balance of 75 percent to them.

Marketing, Matt Roberts explained, was only charged for samples as they were shipped to sales representatives or sent out to doctors. Therefore, marketing was not too concerned about inventory levels as long as there were no shortages. Packaging components and bulk products held in inventory were not segregated from trade sizes in the warehouse or in financial reports. Only the finished samples were given a special account number so that the marketing budget could be debited as the samples were sent out.

NEXT STEPS

Matt Roberts suggested that Andrew set up a meeting the following week with Shannon and John so that each department could state its case and settle on a process for managing marketing-related purchases. Andrew agreed and replied: "I understand that marketing wants things to happen quickly, but we need to follow sound purchasing practices. We should listen to their suggestions regarding supplier selection—after all it is their budget—but the final decision should rest with purchasing. We have the responsibility to see that the greatest possible value is received for every dollar spent. How do we know prices are reasonable without getting other quotations?"

Case 4–3

Portland Bus Company

Richard Kaplan, buyer at Portland Bus Company ("PBC"), in Portland, Oregon, was preparing for his meeting with Laura Henning, business consultant for Bothe US operations, on October 14. Laura would be assisting Richard in managing a series of reverse auctions for approximately 290 components involving seven suppliers. This would be PBC's first use of reverse auctions, and several important decisions had to be made before finalizing arrangements for the online bidding event. Before his meeting with Laura, Richard was to review alternatives for the auction process, including the type of auction to be used and the policy for selecting suppliers.

EXHIBIT 1 **Supplier Profiles**

Supplier	Profile	Current Spend
Dawson Manufacturing	Sheet metal and aluminum fabrication, using laser, CNC machining and plasma cutting technologies. Facility size: 110,000 sq. ft. Subsidiary of a North American-based automotive parts manufacturer with annual revenues of $2 billion.	$575,000
Imperial Fabrication	Sheet metal fabrication using laser and computer integrated systems for the design, engineering and manufacturing of quality custom and standard products. Process capabilities: laser cutting, welding, punching, and bending. Facility size: 100,000 sq. ft. Privately held.	$650,000
Neelin Mfg. Inc.	Contract manufacturing, machining, stamping, and assembly operations. Facility size: 80,000 sq. ft. Privately held.	Being considered for future business
C.R.N. Products Inc.	Sheet metal fabrication, assembly, and painting for small- and high-volume production. Facility size: 60,000 sq. ft.	$210,000
Benson Sheet Metal	Stamping and punching presses, riveting, steel shearing, tube forming, spot welding, and coating services. Facility size: 50,000 sq. ft. Privately held.	$460,000
Beranger Enterprises Ltd.	Light sheet metal processing and welding (1/2″ and thinner) as well as CNC machining and turning of carbon steel, stainless steel, and aluminum. Facility size: 100,000 sq. ft. Privately held.	$40,000
Camber Machining Ltd.	Machining, metal punching, and fabrication, using CNC equipment and on-site engineering capabilities. Facility size: 50,000 sq. ft. Privately held.	$40,000

PORTLAND BUS

PBC was owned by Dawe Motors, a leading global producer of passenger cars and commercial vehicles, headquartered in the United Kingdom. The Portland plant assembled body shells for the Dawe Bus Division. The shells were shipped from Portland to a facility in Medford, Oregon, approximately 275 miles away, for final assembly and painting.

Approximately 550 people worked at the PBC plant. David McGregor, director of materials, headed a staff of 12 people, who were responsible for materials planning, inventory control, and purchasing. Total annual purchases were approximately $250 million across five main commodity groups: fabricated metal, systems, fiber glass, electrical, and power train. However, approximately 75 percent of purchases were set up through corporate purchasing with strategic suppliers, leaving about $60 million to be sourced through David's organization. Richard reported directly to David and was responsible for sourcing fabricated metal components.

METAL COMPONENTS

During the last three months, Richard had analyzed the company's spend in three fabricated metal parts categories: hinges, brackets, and ducts. Ten suppliers were currently responsible for 290 different part numbers, representing an annual spend of approximately $2 million. It had been more than two years since a thorough review of these commodity categories had been conducted, and Richard felt that under current market conditions, significant opportunities existed for cost savings.

Four of the PBC's current suppliers were not in Richard's future plans because of concerns regarding past performance. Furthermore, Richard intended to include a new supplier, Neelin Mfg. Inc., in the online bidding event. Exhibit 1 provides profiles of the seven suppliers

EXHIBIT 2
Reverse Auction Packages

Package	# Part Numbers	Annual Spend ($)
Hinges	7	32,551
Ducts 1	10	208,838
Ducts 2	13	106,236
Brackets 1	12	53,773
Brackets 2	12	119,912
Brackets 3	3	65,389
Brackets 4	9	111,500
Brackets 5	16	54,901
Brackets 6	13	65,997
Brackets 7	12	78,950
Brackets 8	21	48,108
Brackets 9	39	83,557
Brackets 10	15	84,630
Brackets 11	14	55,673
Brackets 12	16	64,734
Brackets 13	7	137,624
Brackets 14	2	71,675
Brackets 15	21	219,922
Brackets 16	18	133,896
Brackets 17	20	166,114
Brackets 18	10	49,771
Total	*290*	*2,013,751*

that Richard was considering for participation in the reverse auction.

THE REVERSE AUCTION

Richard decided to group components into packages as opposed to running 290 separate online bidding events. Eventually, he settled on 21 packages of complementary components, which were similar in terms of manufacturing processes, quality requirements, and production volumes (see Exhibit 2).

PBC's parent company had a contract with Bothe AG, an online bidding event solutions provider, to provide assistance and technical support to all of its divisions for reverse auctions. Located in Europe, North America, and Asia, Bothe provided a range of consulting and technology platforms, working with approximately 200 companies in the automotive, construction, machinery manufacturing, and office supplies industries. Its services included online auctions, supply contract negotiations, supplier management, and a range of web-based technology solutions. The Dawe passenger car division in Europe had recently completed a reverse auction project with Bothe and was very satisfied with the results.

Laura Henning, business consultant for Bothe US operations, had been assigned to work with Richard to manage the reverse auction project. Laura and her team would be responsible for:

1. Working suppliers to set up the Bothe technology platform and providing training to their employees.
2. Communicating relevant documentation to suppliers regarding details of the auction packages, such as part specifications, quality requirements, and volumes.
3. Conducting a test auction with suppliers, and subsequently addressing any technical issues or questions that arise.

4. On the day of the auction, Bothe would monitor the online bidding event and provide helpdesk support to all parties involved. The Bothe platform allows the buyer to watch the reverse auction live.
5. After the auction, Bothe would provide a detailed auction report to the buyer, including the results, which would be available approximately two hours after the auction event.

Laura had indicated that once arrangements were finalized it would take a maximum of two weeks to install the Bothe platform at the suppliers and to train their staff. Testing the platform would take an additional one or two days. Richard expected that suppliers would need at least two weeks to review the packages and prepare for the auctions. Consequently, Richard was planning to run the auctions starting the middle of November, and he hoped to have everything completed by the Christmas holiday.

PREPARING FOR THE REVERSE AUCTION

The meeting on October 14 was to finalize the schedule for the reverse auction events, review alternatives for the auction process, including the type of auction to be used, and set policies for selecting suppliers. Since this was PBC's first reverse auction, David McGregor was sensitive that any decisions might have implications for similar projects in the future. Consequently, he expected to review Richard's plan before proceeding.

Laura explained to Richard that there were a variety of methods for conducting a reverse auction, and the primary decisions included visibility (e.g., what the bidders would see during the auction), length of the auction, policies for extending the length of the auction, and target pricing. For example, the Bothe system could be configured such that every bidder could see the current best price only, a ranking of all bid prices (displayed by color codes), or the bidder's rank only (e.g., best, second, third, etc.). Laura also indicated that while most auctions ran 15 or 30 minutes, it was not uncommon to have policies that extended the event provided there was still bidding activity at the end of the designated time. Furthermore, buyers in some reverse auctions set target prices to provide a pricing benchmark for bidders.

Lastly, Richard needed to decide on what basis the packages should be awarded and to what extent prices could be negotiated following the auction. David had indicated to Richard that he expected a 25 percent reduction in costs as an outcome of the reverse auction project. Richard felt that other factors needed to be considered beyond price. For example, he recognized that there would be costs of switching suppliers, and he wondered how this should be taken into account when awarding business. For example, should the lowest bidder be awarded the package if the price savings was less than the costs of switching? Furthermore, to what extent should PBC take into consideration long-term supply relationships when making the final sourcing decision from the reverse auctions? Richard wanted to be clear and up-front as possible with the suppliers, some of whom he expected may be reluctant to participate.

Chapter **Five**

Make or Buy, Insourcing, and Outsourcing

Chapter Outline

Make or Buy
- *Reasons for Making*
- *Reasons for Buying*
- *The Gray Zone in Make or Buy*

Subcontracting

Insourcing and Outsourcing
- *Insourcing*
- *Outsourcing*

Implications for Supply
- *Outsourcing Supply and Logistics*
- *Supply's Role in Insourcing and Outsourcing*

Conclusion

Questions for Review and Discussion

References

Cases
- *5–1 Garland Chocolates*
- *5–2 Marshall Insurance Company*
- *5–3 Alicia Wong*

Key Questions for the Supply Decision Maker

Should we

- Change the way we currently take make or buy decisions?
- Consider insourcing more?
- Outsource more?

How can we

- Improve our ability to find insourcing opportunities?
- Ensure that supply considerations receive full attention in make or buy decisions?
- Better develop our outsourcing expertise?

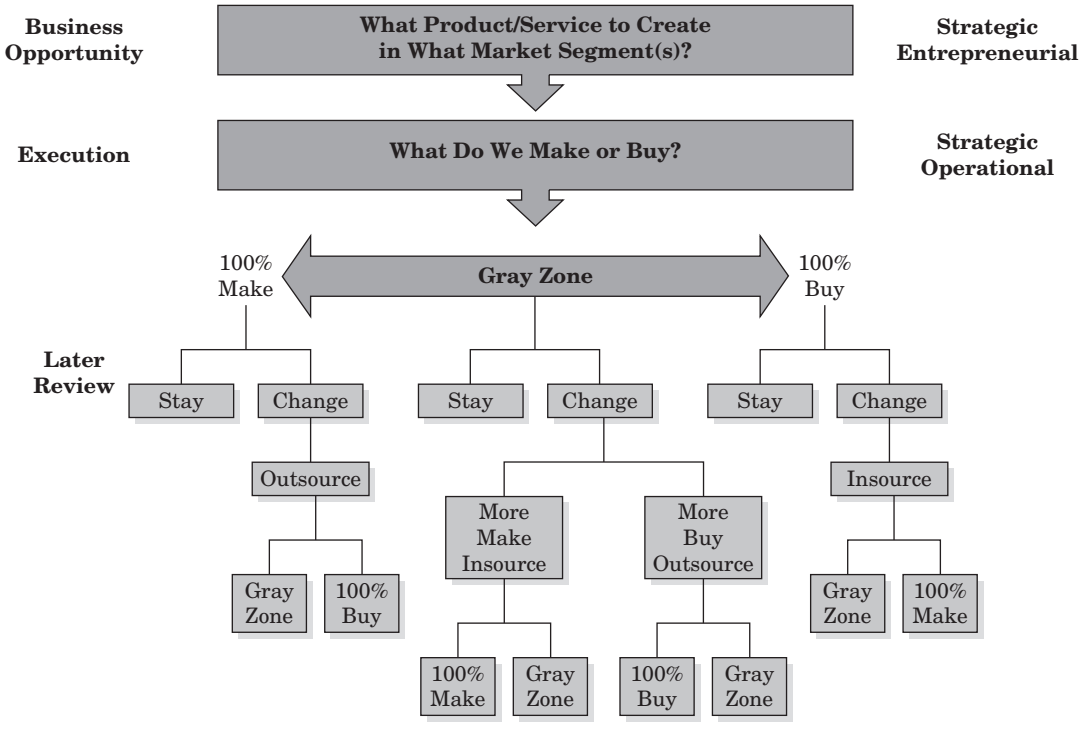
MAKE OR BUY

One of the most critical decisions in any organization is make or buy. When any organization is formed, a series of make or buy decisions need to be made. As the organization grows and adds or drops products and/or services, make or buy decisions continue to be made. In this text, make, buy, insource, and outsource are defined as follows. For any new product or service, make or buy decisions need to be made. A make decision means the organization will produce the good or provide the service internally. A buy decision means the good or service will be procured from a supplier. Later, when internal and/or external circumstances change, make or buy decisions are reviewed and some or all may be reversed. Insourcing refers to reversing a previous buy decision. An organization chooses to bring in-house an activity, product, or service previously purchased. Outsourcing reverses a previous make decision. Thus an activity, product, or service previously done in-house will be purchased. See Figure 5–1. Supply managers can play a major role in make or buy as well as insourcing and outsourcing decisions.

The character of the organization is colored by the organization's stance on the make or buy decision. It is one of vital importance to an organization's productivity and competitiveness. Historically, the make option tended to be favored by many large organizations, resulting in backward integration and ownership of a large range of manufacturing and subassembly facilities. Major purchases were largely confined to raw materials, which were then processed in-house.

Managerial thinking on this issue changed dramatically in the 1990s with increased global competition, pressures to reduce costs, downsizing, and focus on the firm's core competencies. The trend changed to buying services or goods that might historically have been provided or manufactured internally. Management trends favoring flexibility and focus on corporate strengths, closeness to the customer, and increased emphasis on productivity and competitiveness reinforce the idea of buying. It would be unusual if any one organization were superior to competition in all aspects of manufacturing or creating services. By buying from capable suppliers those requirements for which the buying organization has no special manufacturing or service advantage, the management of the buying organization can concentrate better on its main mission. With the world as a marketplace, it is the purchaser's responsibility to search for or develop world-class suppliers suitable for the strategic needs of the buying organization.

FIGURE 5–1 **Make or Buy and Insourcing and Outsourcing Decisions**



A recent North American phenomenon has been the tendency to purchase services that were traditionally performed in-house. These include security, food services, and maintenance, but also programming, training, engineering, accounting, accounts payable, legal, research, personnel, information systems, and even contract logistics and supply. Thus, a new class of purchases involving services has evolved.

The make or buy decision is an interesting one because of its many dimensions. Almost every organization is faced with it continually. For manufacturing companies, the make alternative may be a natural extension of activities already present or an opportunity for diversification. For nonmanufacturing concerns, it is normally a question of services rather than products. Should a hospital have its own laundry, operate its own dietary, security, and maintenance services, or should it purchase these from suppliers? Becoming one's own supplier is an alternative that has not received much attention in this text so far, and yet it is a vital option in every organization's supply strategy.

What should be the attitude of an organization's management toward this make or buy issue? Many organizations do not have a consciously expressed policy but prefer to decide each issue as it arises. Moreover, it can be difficult to gather meaningful accounting data for economic analysis to support such decisions.

In the aggregate for the individual firm, the question is: What should our organization's objective be in terms of how much value should be added in-house as a percentage of final product or service cost and in what form? A strong supply group would favor a

buy tendency when other factors are not of overriding importance. For example, one corporation found its supply ability in international markets such a competitive asset that it deliberately divested itself of certain manufacturing facilities common to every competitor in the industry. In the long term, make or buy and insource or outsource decisions must contribute to building and maintaining resilient supply chains.

Reasons for Making

There are many reasons that may lead an organization to produce a good or service in-house rather than purchase. Competitive, political, social, or environmental reasons may force an organization to make even when it might have preferred to buy. When a competitor acquires ownership of a key source of raw material, it may force similar action. Many countries insist that a certain amount of processing of raw materials be done within national boundaries. A company located in a high-unemployment area may decide to make certain items to help alleviate this situation. A company may have to further process certain by-products to make them environmentally acceptable. In each of these instances, cost may not be the overriding concern. For additional reasons see Table 5–1.

Reasons for Buying

There are many reasons why an organization may prefer to purchase goods or services, including competitive, political, social, or environmental. Government contracts may require a specified percentage of the organization's spend to go to small businesses or to veteran-, woman-, or minority-owned suppliers. A process may require a large amount of water that is scarce locally, or create difficult disposal issues in a particular location. Frequently, certain suppliers have built a reputation that makes their component a preferred part of the finished product. Normally, these are branded items that can be used to make the total piece of equipment more acceptable to the final user. The manufacturers of transportation, construction, or mining equipment frequently let the customer specify the power

TABLE 5–1
Why Make?

1. The quantities are too small and/or no supplier is interested or available.
2. Quality requirements may be so exacting or so unusual as to require special processing methods that suppliers cannot be expected to provide.
3. Greater assurance of supply or a closer coordination of supply with the demand.
4. To preserve technological secrets.
5. To obtain a lower cost.
6. To take advantage of or avoid idle equipment and/or labor.
7. To ensure steady running of the corporation's own facilities, leaving suppliers to bear the burden of fluctuations in demand.
8. To avoid sole-source dependency.
9. To reduce risk.
10. The purchase option is too expensive.
11. The distance from the closest available supplier is too great.
12. A significant customer required it.
13. Future market potential for the product or service is expanding rapidly.
14. Forecasts of future shortages in the market or rising prices.
15. Management takes pride in size.

TABLE 5–2
Why Buy?

1. The organization may lack managerial or technical expertise in the production of the items or services in question.
2. Lack of production capacity. This may affect relationships with other suppliers or customers as well.
3. To reduce risk.
4. The challenges of maintaining long-term technological and economic viability for a noncore activity.
5. A decision to make, once made, is often difficult to reverse. Union pressures and management inertia combine to preserve the status quo. Thus, buying outside is seen as providing greater flexibility.
6. To assure cost accuracy.
7. There are more options in potential sources and substitute items.
8. There may not be sufficient volume to justify in-house production.
9. Future forecasts show great demand or technological uncertainty, and the firm is unable or unwilling to undertake the risk of manufacture.
10. The availability of a highly capable supplier nearby.
11. The desire to stay lean.
12. Buying may open up markets for the firm's products or services.
13. The ability to bring a product or service to market faster.
14. A significant customer may demand it.
15. Superior supply management expertise.

plant brand and see this option as advantageous in selling their equipment. For additional reasons see Table 5–2.

The arguments advanced for either side of the make or buy question sound similar: better quality, quantity, delivery, price/cost, service, lower risk, greater opportunity to contribute to the firm's competitive position, and ability to provide greater customer satisfaction. Therefore, each individual make or buy decision requires careful analysis of both options. Even in the make decision, there will likely be a significant supply input requirement and there is even a greater one for the buy option. Thus, supply managers are constantly required to provide information, judgments, and expertise to assist the organization in resolving make or buy decisions wisely.

The Gray Zone in Make or Buy

Research by Leenders and Nollet suggests that a "gray zone" may exist in make or buy situations. There may be a range of options between 100 percent make or 100 percent buy. (See Figure 5–1.) This middle ground may be particularly useful for testing and learning without having to make the full commitment to make or buy. Particularly in the purchase of services, where no equipment investment is involved, it may be that substantial economies accrue to the organization that can substitute low-cost internal labor for expensive outside staff or low-cost external labor for expensive internal staff.

A good example of a gray zone trade-off in the automotive industry is the supplier who takes over design responsibility for a component from the car manufacturer. In maintenance, some types of servicing can be done by the purchaser of the equipment, other types by the equipment manufacturer.

The gray zone in make or buy may offer valuable opportunities or superior options for both purchaser and supplier.

SUBCONTRACTING

A special class of the make or buy spectrum is the area of subcontracting. Common in military and construction procurement, subcontracts can exist only when there are prime contractors who bid out part of the work to other contractors: hence the term *subcontractor*. In its simplest form, a subcontract is a purchase order written with more explicit terms and conditions. Its complexity and management vary in direct proportion to the value and size of the program to be managed. The management of a subcontract may require unique skills and abilities because of the amount and type of correspondence, charts, program reviews, and management reporting that are necessary. Additionally, payment may be handled differently and is usually negotiated along with the actual pricing and terms and conditions of the subcontract.

The use of a subcontract is appropriate when placing orders for work that is difficult to define, will take a long period of time, and will be extremely costly. For example, aerospace companies subcontract many of the larger structural components and avionics. Wings, landing gears, and radar systems are examples of high-cost items that might be purchased on a subcontract. The subcontract is normally administered by a team that might include a subcontract administrator (SCA), an equipment engineer, a quality assurance representative, a reliability engineer, a material price/cost analyst, a program office representative, and/or an on-site representative.

Managing the subcontract is a complex activity that requires knowledge about performance to date as well as the ability to anticipate actions needed to ensure the desired end results. The SCA must maintain cost, schedule, technical, and configuration control from the beginning to the completion of the task.

Cost control of the subcontract begins with the negotiation of a fair and reasonable cost, proper choice of the contract type, and thoughtfully imposed incentives. Schedule control requires the development of a good master schedule that covers all necessary contract activities realistically. Well-designed written reports and recovery programs, where necessary, are essential. Technical control must ensure that the end product conforms to all the performance parameters of the specifications that were established when the contract was awarded. Configuration control ensures that all changes are documented. Good configuration control is essential to "aftermarket" and spares considerations for the product.

Unlike a normal purchase order of minimal complexity, where final closeout may be accomplished by delivery and payment, a major subcontract involves more definite actions to close. These actions vary with the contract type and difficulty of the item/task being procured. Quite often large and complex procurements require a number of changes during the period of performance. These changes result in cost claims that must be settled prior to contract closure. Additionally, any tooling or data supplied to the contractor to support the effort must be returned. All deliverable material, data, and reports must be received and inspected. Each subcontract's requirements will vary in the complexity of the closure requirements; however, in all cases a subcontract performance summary should be written to provide a basis for evaluation of the supplier for future bidder or supplier selection. Such a report also is necessary in providing information for subsequent claims or renegotiation.

Subcontracts may also apply to services. For example, the "primary supplier" of an item of Durable Medical Equipment, Prosthetics, Orthotics, and Supplies (DMEPOS) is the enrolled supplier that bills Medicare for reimbursement. The primary supplier is responsible for the overall service of furnishing the item and coordinating the care in

compliance with the physician's order and Medicare rules and guidelines. The primary supplier may subcontract certain services such as purchase of inventory, delivery, and instruction on use of the item, and repair of rented equipment.

INSOURCING AND OUTSOURCING

Insourcing and outsourcing occur when the decisions are made to reverse past make or buy decisions. Just because the decision to make or buy was properly made originally, this does not mean it cannot be changed. New circumstances inside the organization, in the market, or in the environment may require the organization to reverse its stance on a previous make or buy decision.

If the previous decision to make or buy was improperly made and can be corrected subsequently, this should be done. However, the arguments for constantly reassessing past make or buy decisions are particularly strong. Perceived risks may have been minimized or eliminated. New technology may permit processes previously considered impossible. New suppliers may have entered the market or old suppliers may have left. New trade-offs between raw materials and components, such as substitution of steel by plastic, may result in new options. It is this constant change in volumes, prices, capabilities, specifications, suppliers, capacities, regulations, competitors, technology, and managers that requires supply managers to review their current make and buy profile continuously in identifying new strengths and weaknesses, opportunities, and threats.

The two questions that need to be addressed on an ongoing basis by a cross-functional team including supply, operations, accounting and marketing are: (1) Which products or services are we currently buying that we should be doing in-house? (2) Which products and services that we are currently doing in-house should we be buying from suppliers?

Insourcing

Insourcing, the often forgotten twin of outsourcing, deals with past buy decisions that are reversed. Given the demands on procurement managers' time, the likelihood that supply managers will initiate an insourcing initiative is relatively small. Continuing to buy is likely to be standard practice. From a supply perspective there are, however, several reasons why supply might have to trigger an insourcing initiative. The most obvious reason is when an existing source of supply goes out of business or drops a product or service line and no other supplier is available. Assuming the requirement for product or service continues, the supply manager needs to find an alternate source. Supplier development or the creation of a new supplier who was previously not selling the product or service is one option. The other is to insource. Similarly, a sudden massive increase in price, the purchase of a sole source by a competitor, political events and regulatory changes, or a lack of supply of a key raw material or component required for the manufacture of the purchased product might force supply to consider insourcing. Thus, anything that threatens assurance of supply may provide supply a reason for insourcing. This might be called the necessity argument: "We would prefer not to produce this product or service in-house, but we really don't have any other options."

There are other organizational factors that may make insourcing an attractive option. The reasons would be similar to the "make" arguments provided earlier in this chapter in the make or buy discussion. We may have developed a unique process for this product or service. Our quality, delivery, total cost of ownership, or flexibility would be vastly improved.

We could provide superior customer service and satisfaction. Insourcing would greatly enhance our competitive ability. This might be called the opportunity argument: "We would prefer to do this in-house because it would give us a strategic competitive advantage."

After the decision to insource has been taken, the smooth transition from suppliers to internal manufacture or service delivery will require supply's special attention. In the first place, how do we discontinue our dealings with our existing supplier(s)? Can the changeover occur simultaneously with current contract expiries or may penalties have to be paid to terminate existing commitments?

With any insourcing initiatives, there is also a new supply issue in terms of raw materials, components, equipment, energy, and services required to produce the particular requirement just insourced. Therefore, supply's capability to provide the required inputs competently is one of the factors to be considered in any insourcing decision.

The Alicia Wong case at the end of this chapter is an interesting example of an insourcing decision. This case describes the opportunity to produce mustard in-house, rather than purchasing it from an outside supplier. Because mustard is used in many products, the decision focuses not only on whether this insourcing is an attractive proposition, but also, if the decision is to go ahead, how to ensure it will be successful. The Wentworth Hospital case in Chapter 7 illustrates a situation where insourcing contract repair services is being considered as a result of a combination of cost and supplier performance issues.

Outsourcing

Organizations outsource when they decide to buy something they had been making in-house previously. For example, a company whose employees clean the buildings may decide to hire a janitorial firm to provide this service. Depending on the good or service, suppliers may be domestic (onshore) or international (offshore). Offshoring is discussed in Chapter 14, "Global Supply Management." A huge wave of outsourcing and privatization (in the public sector) has hit almost all organizations since the late 1980s. Public and private organizations have outsourced a broad range of functions and activities formerly performed in-house as they downsize, "right-size," and eliminate headquarters staff to focus on value-added activities and core competencies to survive and prosper.

Almost no function is immune to outsourcing. Some activities, such as janitorial, food, and security services, have been outsourced for many years. Information Technology (IT), legal, and health care services such as radiology have received much attention recently as targets for outsourcing. Other popular outsourcing targets are mail rooms, copy centers, and corporate travel departments. Accounts payable, human resources, marketing/sales, finance, administration, logistics, engineering, and even supply are examples of functions now outsourced.

An entire function may be outsourced, or some elements of an activity may be outsourced and some kept in-house. For example, some of the elements of information technology may be strategic, some may be critical, and some may lend themselves to lower cost purchase and management by a third party. Identifying a function as a potential outsourcing target, and then breaking that function into its components, allows the decision makers to determine which activities are strategic or critical and should remain in-house, and which can be outsourced.

The growth in outsourcing in the logistics area is attributed to transportation deregulation, the focus on core competencies, reductions in inventories, and enhanced logistics management computer programs. Lean inventories mean there is less room for error in deliveries, especially if the organization is operating in a just-in-time mode. Trucking companies have added logistics

to their businesses—changing from merely moving goods from point A to point B, to managing all or a part of all shipments over a longer period of time, typically three years, and replacing the shipper's employees with their own. Logistics companies have computer tracking technology that reduces the risk in transportation and allows the logistics company to add more value to the firm than it could if the function were performed in-house. Third-party logistics (3PL) providers offer integrated operations, warehousing, and transportation services. The ability to track freight using electronic data interchange technology and a satellite system to tell customers exactly where its drivers are and when the delivery will be made is critical in a just-in-time environment, where the delivery window may be only 30 minutes.

For example, Hewlett-Packard turned over its inbound raw materials warehousing in Vancouver, Washington, to Roadway Logistics. Roadway's 140 employees operate the warehouse 24 hours a day, seven days a week, coordinating the delivery of parts to the warehouse and managing storage. Hewlett-Packard's 250 employees were transferred to other company activities. Hewlett-Packard reports savings of 10 percent in warehousing operating costs.

The reasons for outsourcing are similar to those advanced for the buy option in make or buy decisions earlier in this chapter. There is a key difference, however. Because the organization was previously involved in producing the product or service itself, the question arises: What happens to the employees and space and equipment previously dedicated to this product or service now outsourced?

Layoffs often result, and even in cases where the service provider (third party) hires former employees, they are often hired back at lower wages with fewer benefits. Outsourcing is perceived by many unions as efforts to circumvent union contracts. The United Auto Workers union has been particularly active in trying to prevent auto manufacturers from outsourcing parts of their operations. Additional concerns over outsourcing include:

- Loss of control.
- Exposure to supplier risks: financial weakness, loss of supplier commitment, slow implementation, promised features or services not available, lack of responsiveness, poor daily quality.
- Unexpected fees or "extra use" charges.
- Difficulty in quantifying economics; conversion costs.
- Supply restraints.
- Attention required by senior management.
- Possibility of being tied to obsolete technology, and
- Concerns with long-term flexibility and meeting changing business requirements.

As organizations have gained more experience in making outsourcing decisions and crafting outsourcing contracts, they have become better at applying sourcing and contracting expertise to these decisions. From writing the statement of work (SOW) or request for proposal (RFP) to defining the terms and conditions, the success of an outsourcing agreement lies in the details.

There are two cases on outsourcing at the end of this chapter that are illustrative of outsourcing decisions in different contexts. Garland Chocolates is considering outsourcing packaging for Edgeworth Toffee rather than investing in expensive capital equipment. The Marshall Insurance Company case deals with a proposal by a supplier to handle forms and printed materials inventory management. The Garland Chocolates case presents outsourcing in a traditional manufacturing context, while the Marshall case illustrates outsourcing a service in an administrative setting.

IMPLICATIONS FOR SUPPLY

Supply and logistics management may be involved in make or buy and insource or outsource decisions in two ways: (1) Some or all of the activities of the supply and logistics functions may be a target for outsourcing. (2) Supply and logistics may be part of an internal team conducting analysis for a make or buy, or insource or outsource decision.

Outsourcing Supply and Logistics

While the supply function may be outsourced completely, the procurement of indirect or noncore spend is more likely to be outsourced than procurement of direct or core spend. Benefits from outsourcing procurement may include improved process compliance and control, optimized working capital, and improved process efficiency.

There are three types of procurement outsourcing contracts: procure-to-pay (P2P), source-to-contract (S2C), and source-to-pay (S2P). P2P contracts cover the procurement activities of day-to-day purchasing (approval workflow, material acquisition, purchase order, expediting, material and invoice receipt, and invoice payment), performance management (financial performance, compliance management, policies and procedures, and performance and results reporting), and accounts payable (master data maintenance, process payment request, travel and expense (T&E) claims processing, EDI/P-card administration, month-end closing, supplier inquiries, and reporting). Source-to-contract (S2C) procurement outsourcing includes spend data management, strategic sourcing, supplier management, and demand management. Source-to-pay (S2P) procurement outsourcing is an end-to-end suite that includes all the processes in procure-to-pay and source-to-pay.

For example, in 2007, Microsoft selected Accenture as its procurement process outsourcing provider. Accenture rolled out common processes across 95 countries in 36 languages from four service centers. Operational costs were reduced by 35 percent, plus negotiated savings were up 35 percent from the prior year. Standardized global processes and increased transparency enabled early payment discount savings of over $10 million.[1]

Many tasks associated with the logistics function as well as the entire function itself have been heavily outsourced. According to Capgemini's 17th Annual Third Party Logistics study (2012), transactional, operational, and repetitive activities such as transportation, warehousing and freight forwarding tend to be the most frequently outsourced. Shippers outsourced 54 percent of their transportation spend and 39 percent of their warehouse operations. The three primary reasons for outsourcing logistics activities are improved services, reduced costs, and increased ability to focus on core competencies.

Deciding what represents a core competency to an organization is not always an easy task, nor is the decision always the same for a specific function. For example, ownership and management of an in-house fleet of vehicles may be subject to the decision to outsource or maintain in-house. In an organization where the sales force is large, the cars for sales representatives may be seen as an extension of the sales force, and part of the company's ability to outperform the competition in personal sales. Many of the functions of fleet may be outsourced—leasing rather than owning vehicles, maintenance, resale

[1]www.accenture.com/SiteCollectionDocuments/PDF/Accenture-Procurement-BPO-Infographic-final.pdf.

of vehicles—but the contact with the drivers may be retained as an in-house function because keeping the drivers (sales force) happy is critical to the success of the organization. In a utility company, the mechanical expertise needed to maintain specialty vehicles may be seen as part of the company's core competency, whereas the maintenance of the automobile fleet may not. The outsourcing decision is a function of many factors, and each organization must assess these factors based on the goals and objectives and long-term strategy of the organization.

Supply's Role in Insourcing and Outsourcing

Research indicates that supply has had relatively moderate involvement in the outsourcing decisions made in many organizations. However, given the nature of these insourcing and outsourcing decisions, supply managers should be heavily involved to add in the following ways:

- Providing a comprehensive, competitive process.
- Identifying opportunities for insourcing or outsourcing.
- Aiding in selection of sources.
- Identifying potential relationship issues.
- Developing and negotiating the contract.
- Ongoing monitoring and management of the relationship.

The strategic importance of make or buy and insourcing and outsourcing decisions is high, so management must ensure these decisions are right. Appropriate supply input is critical when making these decisions and in managing the outcomes.

Conclusion

Make or buy, insourcing and outsourcing are key strategic decisions for any organization. That each of these decisions can be reviewed and reversed at a later date, as conditions warrant, adds to the challenge of maintaining an appropriate mix of in-house activities and purchased goods and services. Effective supply management requires an ongoing active contribution from supply into this continuing assessment process. The more skilled the supply group at exploiting market opportunities and developing competitive sources, the more ready the organization should be to buy and outsource.

Questions for Review and Discussion

1. Why should an organization switch from buying to making?
2. What is insourcing? How might one make the decision to insource an activity or not?
3. Why is the make or buy decision considered strategic?
4. What is the gray zone in make or buy? What are its implications?
5. Why might an organization decide to outsource? Can you give an example?
6. What is subcontracting? How does subcontracting differ from a typical purchase order (PO)?
7. Why would an organization outsource its logistics? Engineering? Marketing?

8. In the public sector what name is frequently used for outsourcing? What are some major advantages to outsourcing in the public sector?
9. What role is expected of supply once an outsourcing decision has been made?
10. If you were the sole owner of your own company, would you favor making or buying? Why?

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Case 5–1

Garland Chocolates

Shanti Suppiah, director of operations at the Garland Chocolates plant in Durham, North Carolina, was preparing for a team meeting scheduled for Monday, March 18, to decide what to do about declining margins for the Edgeworth Toffee brand. Options were to invest in new equipment or outsource manufacturing and packing. It was Wednesday, March 12, and Shanti needed to prepare her analysis and develop a recommendation prior to the meeting.

GARLAND CHOCOLATES

Headquartered in London, UK, Garland Chocolates (Garland) was a leading global food manufacturer with annual revenues of $3 billion. The company produced a wide range of chocolate and confectionary products, under more than 65 brands. It operated more than 50 plants globally, including eight plants in the United States. Garland's products

were among the leading brands in the industry, and the Durham plant manufactured 20 product lines that were distributed to retail customers in North America, including grocery store chains, boutique candy shops, and convenience stores.

Garland's brands were managed by cross-functional teams with representatives from sales and marketing, operations, finance, engineering, purchasing, and distribution. Each team was governed by corporate goals for growth, profitability, and brand management, but was given significant autonomy to make strategic and tactical decisions in order to achieve their business performance objectives (BPOs).

The competitive nature of the industry placed an upper limit on prices, so margins were determined by production and supply chain efficiencies. Consequently, cost control and continuous improvement were high priorities. The company's enterprise resource planning (ERP) system generated weekly BPO reports for team members.

THE EDGEWORTH TOFFEE BRAND

Production of Edgeworth Toffee was a two-step process: manufacturing and packing. The product was manufactured in two formats. The first format was a fixed-size, retail-ready pack, which contained a half-pound of toffee. The second format was a 10-pound bulk package that was placed in stores so that customers could select the amount of toffee they wanted and self-pack the product. Production of the fixed-size format was approximately 2,500 cases a year, compared to approximately 3,000 cases a year of the bulk format. Both formats sold for $145 per case.

There were two dedicated packing lines for Edgeworth Toffee, one for each format. However, the packing lines had long outlived their useful lives, and efficiencies had declined in recent years (see Exhibit 1). Furthermore, sales of Edgeworth Toffee had been flat for the past couple of years, and in an effort to spur consumer interest in the brand, marketing was proposing a new marketing strategy that included a facelift for the packaging. However, the new packaging would require a different type of packing technology. John Slaughter, the representative from marketing on the Edgeworth Toffee team, felt that the introduction of new packaging combined with a new marketing campaign could deliver as much as a 20 percent increase in sales. It was unclear to Shanti whether the new marketing strategy would be enough to stimulate increased sales, or if the product was mature and a decline in demand was inevitable.

EXHIBIT 1 **Operating Standard Costs for Edgeworth Toffee**

	$ per case	%
Selling price	$145.00	100
Raw material	24.65	17
Packaging material	29.00	20
Labor—manufacturing	13.05	9
Labor—packing	7.25	5
Overhead & depreciation	21.75	15
Total cost	95.70	66
Margin	49.30	34

THE MANUFACTURING AND PACKING LINE REPLACEMENT OPTIONS

The accounting department set standard costs for each product line annually. Exhibit 1 provides the standard costs for Edgeworth Toffee, and Exhibit 2 shows actual operating performance data for the manufacturing and packing lines. As shown in Exhibit 2, the packing line was operating at 48 percent efficiency, and the scrap rate was nearly 10 percent. Annual maintenance costs on the packing line were approximately $18,000 per year and expected to increase by at least 25 percent in the next 12 months.

Working with Ian Haase, purchasing manager at the Durham plant and a member of the Edgeworth Toffee team, Shanti obtained an estimate of $140,000 for the cost of replacing the two packing lines for Edgeworth Toffee, including installation. It was expected that the new equipment would be able to achieve the BPO efficiency and scrap rate targets and be able to accommodate the new packaging that marketing was recommending.

Shanti also felt that it was time to examine replacement of the manufacturing line. The manufacturing and packing lines had originally been installed together more than 20 years earlier. Although efficiency of the

EXHIBIT 2 **Manufacturing and Packing Line Performance Statistics**

Measure	Standard (%)	Actual (%)
Manufacturing efficiency	80	76
Manufacturing scrap rate	1.2	1.5
Packing efficiency	80	48
Packing scrap rate	1.2	9.6

manufacturing line was close to the target of 80 percent, it was also showing signs of deterioration. The efficiency rate had declined to 76 percent, compared to more than 90 percent five years prior, and it had become increasingly more difficult to find replacement parts. A new manufacturing line would cost approximately $600,000 installed.

OUTSOURCING

In addition to investigating options to replace the existing manufacturing and packing lines, Shanti had also looked into outsourcing. A preliminary review indicated that there would be substantial coordination costs if only packing was outsourced; therefore, outsourcing manufacturing and packing was investigated. Ian and Shanti selected two contract manufacturers to submit proposals, Martin Contract Manufacturing (Martin) and Dasari Inc. Bids were requested from both for the existing packaging and the new packaging proposed by marketing. In order to make sure the suppliers were well informed about the manufacturing and packing processes, both were invited to tour the Durham plant, and they were provided with detailed information and related data regarding the operation of the lines.

Following a review of the proposals submitted by the suppliers, Ian and Shanti decided that Martin had the best bid. Martin quoted a cost of $68.00 for manufacturing and packing for both the current packaging and marketing's new packaging. The supplier would be responsible for raw material and packaging material costs. In addition, Garland would pay $35,000 in tooling costs up front. Martin indicated that it would need six months to ramp up production of Edgeworth Toffee.

THE TEAM MEETING

As Shanti looked at the information on her laptop that had been collected regarding manufacturing and packing of Edgeworth Toffee, she knew that something had to be done to address the declining margins of the brand as a result of increased production costs. Investing in new equipment seemed like an obvious solution; however, the capital investment would be significant and her proposal would need to exceed the company's 10 percent cost of capital rate to get approval by finance.

While reviewing the proposal by Martin, Shanti felt that some of the overhead costs at the Durham plant could be eliminated if production of Edgeworth Toffee was outsourced. The estimate provided by the accounting department was that overhead costs allocated to the brand could be reduced by approximately 30 percent if production was outsourced.

Historically, the company's strategy had been to control production of its products to ensure quality and delivery performance. Garland had an excellent reputation with it customers and the customer service level for Edgeworth Toffee was a line fill rate of 98 percent. However, if the case to outsource could be made successfully to the team on Monday, Shanti felt that senior management would approve the proposal. This was an important decision and she wanted to make a clear recommendation at the meeting on Monday, supported by a thorough analysis of both options.

Case 5–2

Marshall Insurance Company

Kara Murphy, purchasing manager with Marshal Insurance Company (Marshall), in Spokane, Washington, was evaluating a proposal submitted from David Callum, from Gilmore Printing (Gilmore). David was proposing that Gilmore take responsibility for managing all forms and printed materials inventory for the Marshall Automobile Club. Kara could see the advantages of outsourcing management of printed materials, but she remained concerned that this arrangement would not provide the service that clients and employees had come to expect. It was Thursday, June 12, and David was expecting a response from Kara on Tuesday, June 17, during a meeting scheduled for that afternoon.

MARSHALL INSURANCE COMPANY

The Marshall Insurance Company was a large, publicly held, personal lines property and casualty insurer. Founded in 1948, it had $73.5 billion in total assets. The Marshall Automobile Club (MAC) was a division of Marshall that provided roadside assistance services to its clients 24 hours a day, 365 days a year. Its more than 750,000 clients included both individuals and corporations.

MAC provided services to two customer groups, corporate clients, such as original equipment automotive manufacturers (OEMs) who provide free roadside assistance plans with new

vehicle purchases, and individuals (or retail clients). Individual members could choose from a variety of plans for families that provided coverage for cars, trucks, motorcycles, and recreational vehicles. In addition to traditional roadside services, MAC offered features such as a trip planning, a travel reservation service, and trip interruption insurance.

Individual clients would join MAC through an online registration tool or by completing a form at a local Marshall office. Payment was typically made using a credit card. OEM clients sent their membership information to MAC daily in encrypted data files. Both individual and corporate client membership information was processed at the Spokane office, where membership cards were prepared and sent out along with an information kit that included a welcome letter, handbook, various promotional materials, and a keychain. Kits were customized for each client, in some cases using OEM letterhead if the member was joining as part as a new vehicle purchase plan. Anywhere from 2,000 to 3,000 kits were assembled each week, which took the time of two full-time staff. It was common to have more staff work on kit assembly in periods of strong demand. Storeroom staff were paid $900 per week plus benefits.

Kara's responsibilities included managing the 3,000 square foot storeroom, where printed materials were stored and kits were assembled. In addition to materials for distribution to new clients, other printed materials included MAC marketing brochures and promotional materials. In total, more than 250 different printed products were held in inventory. In order to take advantage of discounts from printing suppliers, MAC had four to six months of inventory for many products.

THE GILMORE PROPOSAL

During a meeting the previous week, David Callum proposed to Kara that his company take responsibility for managing forms and printed materials for MAC. The proposal indicated that Gilmore would manage relationships with printing suppliers, including inventory management, kit fulfillment, and distribution to clients. David described how they were providing this service to other large corporate clients, in a range of industries, that were interested in eliminating manual back-office operations. He indicated that the typical fee was approximately $3.00 per kit, including mailing costs. The purpose of the meeting on Tuesday was to see if there was interest from Kara in pursuing the proposal; at that time Kara would need to provide David with details regarding annual volumes and materials involved.

Kara could see the advantages of outsourcing management of the storeroom operations and kit assembly. Office space was at a premium at Marshal, and the storeroom could easily be converted to other uses. The headaches associated with ordering materials and maintaining inventory records could be eliminated.

However, Kara did have concerns. First, she was suspicious that Gilmore was looking to take over all the printing business for MAC. Although an important supplier, Gilmore was currently responsible for approximately 30 percent of the printing purchases for MAC. Under the outsourcing arrangement proposed by David, Gilmore would take over existing contracts with Marshall suppliers, but as these contracts expired, it would be up to Gilmore to decide who would do the printing.

Secondly, timely processing of client membership cards and kits was critical. The expectation was that these materials would be processed within 24 hours. Kara was worried about maintaining service levels under an outsourcing arrangement with Gilmore. Furthermore, client information was confidential, and Kara had concerns about security and ensuring that Gilmore did not use the MAC client database for other purposes, such as advertising and promoting products and services for other customers.

PREPARING FOR THE MEETING

Kara felt that the proposal from David had merit and she wanted to give it careful consideration. As she examined the information he had left with her, Kara wondered how to proceed. Were the risks worth the potential problems? What questions should she ask at the meeting on Tuesday? And were there any conditions she should place on the arrangement with Gilmore if they were to proceed?

Case 5–3

Alicia Wong

Alicia Wong, Corporate Supply Manager, Thain Foods Limited, wanted to prepare a proposal to manufacture mustard in-house. Mustard, an important ingredient in many of the company's products, was currently purchased from an outside supplier. She hoped a comprehensive proposal could be prepared in one-month's time for the CEO's approval.

GENERAL COMPANY BACKGROUND

Thain Foods Limited (TFL) had been in business for more than 30 years. Its products included a wide range of syrups, fudges, cone dips, sauces, mayonnaise, and salad dressings. Its customers were major food chains, hotels, and restaurants in North America and Europe.

TFL believed in continuous improvement to its operations. Over the last two years, it invested more than $2 million in plant facilities, the bulk of it new, state-of-the-art process equipment and process control. All production and process control functions were computerized for maximum efficiency.

TFL employed about 120 people. It had a corporate structure of CEO; president; executive vice president, domestic sales; and national account manager and used a network of food brokers who sold and promoted its products.

THE SUPPLY AREA

Alicia was responsible for supply and reported directly to the CEO. She had an inventory control officer, a buyer, and a receiver under her supervision. Purchases could be classified into five different types: labels, packaging, raw materials, commodities, and MRO supplies. Mustard was an important raw material used in many of TFL's products.

CURRENT PRACTICE: PURCHASING MUSTARD EXTERNALLY

Whenever mustard was required, the buyer e-mailed the supplier and requested that it prepare the appropriate amount to be picked up by a truck from TFL. The purchase order would be prepared before the truck left for the supplier, normally the next day. The mustard supplier used mustard seed as its raw material and blended in the other ingredients after the seed had been reduced to mustard flour. Every month TFL purchased 500 drums, or 100,000 liters, of mustard. The cost of the mustard itself was $64 per drum. Freight costs were borne by TFL and amounted to about $8 per drum. TFL operated three eight-hour shifts, five days a week. Each worker was paid about $20 per hour. It took about 10 minutes of a worker's time to handle each drum. This included pouring the mustard into the processing kettle, making sure other added ingredients mixed well, and rinsing the drums. The drums were bulky and, because they could not be used in the plant for other purposes, had to be rinsed for a contractor who took them away. The costs of disposing of the drums in this manner were negligible. Other costs and overhead of purchasing were $0.02 per liter.

SUGGESTED CHANGE: MANUFACTURING MUSTARD IN-HOUSE

The mustard to be produced at TFL would be composed of roughly 60 percent solid, 20 percent water, and 20 percent vinegar. The solid portion was a spice blend, consisting essentially of mustard flour, salt, and other spices that could be readily bought. Water was not a problem because the city provided a reliable supply. Vinegar was already a raw material that TFL ordered in bulk regularly from suppliers. Alicia therefore believed that it was a simple matter for TFL to make the mustard for its own use. TFL only needed to buy the spice blend and add water and vinegar in the right proportions. She approached a supplier who indicated that it could make the spice blend at a delivered price of $0.15 per liter for TFL, including freight. However, it needed time for tests to ensure that the blend would be of the right quality for TFL's use. Vinegar cost TFL $0.1875 per liter delivered in 15,000 liter lots. And TFL was paying $0.025 per liter for water. Alicia also checked whether production had the time and equipment to make the mustard. Production felt that the change would not be too drastic and no additional workers would be necessary. However, it would use up more of the existing workers' time. Production calculated that the change would entail a total labor and overhead cost of about $0.105 per liter of mustard using standard cost accounting for labor time and overhead charges.

Alicia organized an information gathering and discussion session involving supply, production, quality assurance, and distribution to discuss the proposed change. The workers were keen on the idea because this meant that they would no longer have to haul and rinse the bulky drums (water and vinegar could be easily channeled to the mixing containers using existing pipes). However, quality assurance expressed concern about the quality of mustard if produced in-house. Because the mustard was an ingredient in many of TLF's products, such a change might adversely affect the quality and taste of these products.

Alicia wanted her proposal for in-house manufacture of mustard to be in the company's best interest and wondered how to proceed next.

Chapter **Six**

Need Identification and Specification

Chapter Outline

Need Criteria in the Value Proposition
- *1. Strategic Criteria*
- *2. Traditional Criteria*
- *3. Additional Current Criteria*

Categories of Needs
- *1. Resale*
- *2. Raw and Semiprocessed Materials*
- *3. Parts, Components, and Packaging*
- *4. Maintenance, Repair, and Operating Supplies*
- *5. Capital Assets*
- *6. Services*
- *7. Other*

Repetitive or Nonrepetitive Requirements?

Commercial Equivalents

Early Supply and Supplier Involvement

Methods of Description
- *Brand*
- *"Or Equal"*
- *Specification*
- *Miscellaneous Methods of Description*
- *Combination of Descriptive Methods*
- *Sources of Specification Data*

Standardization and Simplification

Conclusion

Questions for Review and Discussion

References

Cases
- *6–1 Moren Corporation (A)*
- *6–2 Moren Corporation (B)*
- *6–3 Carson Manor*

Key Questions for the Supply Decision Maker

Should we

- Rethink our approach to strategic requirements?
- Initiate a simplification and standardization program?
- Change our specification method?

How can we

- Define our internal needs better to suppliers?
- Improve our acquisition of services?
- Leverage our environmental successes in the supply chain?

Need identification and specification are major value influencers. Therefore, two key decisions are addressed in this chapter: (1) How do we determine organizational needs? and (2) How do we translate and communicate these needs to (potential) suppliers?

Organizational needs that must be met by outside suppliers arise in every part of the organization and with every employee. Furthermore, if the organization serves a customer base with goods and/or services, these customer needs could well be the main drivers of the acquisition system of the organization. Therefore, for an automobile manufacturer, by far the largest portion of its spend with suppliers (for Toyota close to 80 percent of its total costs) is spent on materials and parts that will comprise the vehicle sold to customers. A good place to start addressing the need questions is to identify the major influencers of those needs. Need identification depends on the nature, size, and location of the organization as described in the first chapter. In this chapter the category of need will be addressed as well as description of needs.

NEED CRITERIA IN THE VALUE PROPOSITION

The management of supply is keenly concerned about the value proposition for specific needs acquired from suppliers. The criteria for deciding what, in a particular instance, represents good value fall into three levels: (1) strategic, (2) traditional, and (3) additional current.

The Moren Corporation (A) case at the end of this chapter is a good example of the application of the three levels of criteria to the service acquisition on a major capital project. What criteria should apply to the design of a project, and what are the implications of purchasing the design from an outside firm?

1. Strategic Criteria

The overarching question about any organizational requirement is the strategic impact. Is this a strategic requirement or not?

One potential and frequently used attribute is the financial implication or impact of the requirement. Major spend areas can be identified by a breakdown of any organization's

acquisition needs according to an ABC or Pareto analysis in which "A" items or about 10 percent of the number of separate needs account for 70 percent to 80 percent of the dollar value of the total corporate spend. Focusing significant management attention on these "A" items or high spend needs makes a lot of sense. Strategic sourcing is often used for this category to align supply strategy with corporate strategy.

Other criteria for making a requirement strategic include risk reduction, access to new technology or new markets, assurance of supply in tight markets, revenue enhancement, potential competitive benefits, and corporate image or reputation improvement. These other criteria may be less obvious and require the supply manager to think strategically at a corporate level rather than on an operational and process-focused level. Creativity and a focus on the future are also required to identify which needs are strategic and which ones are not. Corporate requirements do not always reach the supply manager with labels attached: strategic or nonstrategic. Thus, a major contribution opportunity for the supply manager is to bring to light strategic implications of certain requirements, given specific market conditions and corporate strategic aspirations.

The identification of a requirement as strategic demands a very high degree of subsequent supply attention.

2. Traditional Criteria

Traditional criteria for supply management comprise the traditional value proposition of (1) quality, (2) quantity, (3) delivery, (4) price and (5) service. These five criteria have been labeled traditional because they have been identified in supply literature for more than 100 years. They make common sense, are largely quantifiable, and make up a large percentage of most existing supplier evaluation systems.

1. **Quality:** Quality covers both functionality: "Does it do the job we want done?" and conformance to specification: "Does it fit the specification agreed to?" Failure to meet quality criteria makes the product or service unacceptable, with potentially serious consequences for the supply organization and its customers. Therefore, meeting quality standards is a first and minimum demand on suppliers.
2. **Quantity:** The quantity supplied has to be sufficient to meet demand.
3. **Delivery:** The timing of the delivery has to meet the purchasing company's needs. This can be fast or slow, but must be as promised.
4. **Price:** On the assumption that the previous three criteria of quality, quantity, and delivery are up-front requirements that must be met, or order qualifiers, then price can be used as the "order getter." The distinguishing difference may be the price and terms offered by different suppliers. The four criteria of quality, quantity, delivery, and price are covered in significant detail in the following four chapters. Therefore, their treatment in this chapter is short.
5. **Service:** Although in practice many purchasers refer to a supplier as providing good service when the supplier delivers regularly on time, that is not the only definition of service. Service may include design, recordkeeping, transportation, storage, disposal, installation, training, inspection, repair, and advice, as well as a willingness to make satisfactory adjustments for misunderstandings or clerical errors. Some supply managers include the supplier's willingness to change orders on short notice and be particularly responsive to

unusual requests as part of their evaluation of the service provided. To cover some types of service, suppliers issue guarantees, covering periods of varying length. Some service factors may only come to light after a trade relationship has been established.

If the service is vital to the success of the purchase, such as installation for equipment, or training of operators, then it needs to be specified as part of the requirement. Service components like a helpful and pleasant attitude, though real, may be more difficult to quantify, yet distinguish one supplier from another.

Many suppliers specifically include the cost of service in the selling price. Others absorb it themselves, charging no more than competitors and relying on the superior service for the sale. One of the difficult tasks of a purchaser is to get only as much of this service factor as is really needed without paying for the excessive service the supplier may be obliged to render to some other purchaser. In many instances the service department of a manufacturing concern is maintained as a separate organization and profit center. The availability of service is an important consideration for the buyer in securing the "best buy" at the outset.

The Moren Corporation (B) case at the end of this chapter requires special consideration of the traditional five criteria as they apply on a major construction project.

3. Additional Current Criteria

Supply management has become more complicated over the past decades. Additional criteria have been added beyond strategic and traditional, thereby increasing the difficulty of assuring a sound value proposition.

These additional current criteria include: financial, risk, environmental impact, innovation, regulatory compliance, and social and political factors.

1. Financial

Financial criteria beyond price include improvement of the corporate financial statements, both balance sheet and income statement, to raise the company's attractiveness in the eyes of the investment community. They include revenue enhancement, working capital and accounts receivable reduction, cash flow improvement, inventory reduction, and any other initiative that improves return on assets or investment, raises the share price, or lifts the company's financial ratings.

2. Risk

Every business decision involves risk, and supply is no exception. Supply chain risk can be classified into three main categories: (1) operational risk: in supply terms, the risk of interruption of the flow of goods or services, (2) financial risk: in supply terms, the risk that the price or total cost of the goods or services acquired will change significantly, and (3) reputational risk: in supply terms, risk that the reputation of the enterprise is adversely affected by the method of acquisition or the behavior of the supplier. All three risks affect the survival, competitiveness, and bottom line of the organization and may occur simultaneously. Chapter 2 provides more detail on managing supply risks.

3. Environmental

Climate change and water, earth, and air pollution have raised environmental concerns that must be addressed in all areas of the supply chain. While disposal of hazardous goods has

been a responsibility of supply managers for several decades, environmental issues have grown considerably. Reexamining the total supply chain from an environment perspective raises questions way beyond hazardous goods disposal. The amount of energy and water and scarce resources used, the transportation and handling systems and distances traveled, the discharge of undesirable gases into the air or substances into the earth—all influence the design, movement, creation, and disposal phases in the supply chain to minimize the "footprint." Thus, the "best buy" has to include environmental impact as a standard consideration.

4. Innovation

Innovation as a criterion for determining best value refers to the pursuit of continuing improvement. Current suppliers are expected to provide suggestions for value improvement and total cost of ownership reduction on an ongoing basis. Such suggestions may require the supply organization to make changes in design, communication, handling, advance notice, scheduling, or any other supply chain practice that can be improved. Innovation suggestions may also involve supplier changes and any other suggestions that may improve the purchaser's revenues or costs. The reason for including innovation as an additional value criterion is that the supplier is forced to ask, How can we do better? and What can make my customer more successful?

5. Regulatory Compliance and Transparency

All agreements reached between buyers and sellers have to comply with the relevant laws and regulations.

Failure to comply can damage the reputation of the parties and result in fines or citations. The legal framework for trade is covered in Chapter 15, "Legal and Ethics." An extensive and growing legal and regulatory structure affects trade in most developed countries, and compliance is not a minor matter. Moreover, financial scandals and new accounting standards have increased demands for greater transparency on all financial dealings of a company. Therefore, long-term contracts, lease obligations, and hedge positions have to be reported properly. Failure to do so may mislead investors and incur the wrath and penalties of a range of industry watchdogs and regulators.

6. Social and Political Factors

Corporate social responsibility (CSR) has become prominent in the last decade. Companies are supposed to behave like good corporate citizens and recognize that they have social responsibilities in the countries in which they operate. Therefore, dealing with socially responsible suppliers is a plus for the supply organization's image and reputation as well as its ability to develop resilient and sustainable supply chains. Promoting opportunities for disadvantaged, minority, and small business suppliers to quote and receive corporate orders is seen as a socially desirable action. MRO and small value purchases are typical categories of needs wherein socially disadvantaged and small suppliers can make a reasonable value proposition. Activists often link environmental and social sensitivity together as one area where organizations must demonstrate a willingness to search for better solutions. Building an environmentally advanced facility in a high unemployment area of the country would be seen as a concrete example.

Political concerns do not refer to paying politicians under the table. They include a willingness to support the government in its priorities, rather than opposing them. If it is possible to support "Buy Local" government initiatives, then a company is expected to do

so, even if it is not a hard regulatory requirement. Assisting government training initiatives and working on government-sponsored industry panels would be additional examples.

The collective set of strategic, traditional, and additional current criteria for need identification and subsequent supply chain decisions makes for a complex analysis in which judgment also plays an important part. Not every acquisition will require an exhaustive analytical review, but the supply professional through experience and judgment learns which criteria are likely to be relevant for any particular acquisition.

The Carson Manor case at the end of this chapter deals with the challenge of evaluating service supplier bids in response to a request for proposals based on a fairly broad definition of needs. How do you know that one consultant fits your needs better than another?

CATEGORIES OF NEEDS

Organizational needs can be classified broadly into seven categories. These are (1) resale, (2) raw or semiprocessed materials, (3) parts, components, and packaging, (4) maintenance, repair, and operating supplies (MRO), (5) capital assets, (6) services, and (7) other. Each of these categories covers a wide range of requirements (see Table 6–1).

TABLE 6–1
Categories of Needs

	Categories of Needs
1. Resale	Resellers comprise retailers, wholesalers, distributors, agents, brokers, and traders. What they can resell covers the full range of the remaining five categories below.
2. Raw and Semiprocessed Materials	Most users of materials are converters, such as factories, and this category includes commodities, agricultural, and industrial.
3. Parts, Components, and Packaging	Assemblers use parts and components produced by their suppliers to create a finished product. Parts and components may be standard or special depending on the decision of the designer of the finished product.
4. Maintenance, Repair, and Operating Supplies (MRO) and Small Value Purchases (SVP)	Every organization has MRO requirements and SVPs. The availability of MRO suppliers is critical to maintain continued uninterrupted operation of the office, factory, facility, etc. Because many MRO requirements are relatively small in dollar value, SVPs are also included in this category. For SVPs, assuring availability at minimum acquisition cost is a challenge.
5. Capital Assets	Any requirement that accountants classify as capital, and, therefore, an investment, becomes a capital item. Equipment, IT, real estate, and construction are included in this category. Capital items can be depreciated, are often bought under a separate budgetary allocation, and may require special financing arrangements.
6. Services	Services are intangible and nonmanufactured. Every organization acquires a variety of services.
7. Other	Anything not covered by the above categories falls into this last one. Major requirements could be energy and water. This category would also include unusual and infrequent requirements, probably better dealt with on an ad hoc or project basis.

In large organizations it is usual to assign supply professionals all or part of a category of requirements. In small organizations one person may have to cover the full range. The supply execution required for each category may be different, as discussed below.

1. Resale

Since resellers represent a distribution channel between buyers and sellers, the abilities to buy well and sell profitably are critical to success. Resellers who do not take possession of goods or supply additional services may charge a small margin. The potential for a reseller's customer to bypass the reseller and deal directly with the reseller's supplier is an ever-present threat, as is the possibility that the reseller's supplier will bypass the reseller and deal directly with the reseller's customers. For example, Honda recently decided to discontinue selling its nonautomotive products such as ATVs and motorbikes through separate dealers and to consolidate all Honda brand products with automotive dealerships. Insurance companies often sell their products and services through brokers as well as their own sales force. Airlines sell direct to customers as well as through online and brick and mortar travel agencies.

For resellers who take ownership of the goods they resell, the largest single cost is the price they pay for the goods. Therefore, financial management of receivables and payables and cash flow is a major skill required most along with logistics management. Walmart is reputed to be able to sell a very large portion of its store merchandise before it has to pay its suppliers. In effect, its suppliers are financing Walmart's operations and inventories.

Manufacturers may choose to resell some products to complete a full line and may offer maintenance, lubricants, or parts to improve the attractiveness of their products in use.

In the fashion industry, the ability of the retail buyer to spot trends and assess the likelihood that a given style or color of garment will sell well is a critical attribute.

2. Raw and Semiprocessed Materials

Raw materials are basic substances in their natural, modified, or semiprocessed state that are used as inputs to a production process. For example, a steelmaker needs iron ore or scrap steel, coke, and a range of additives to create finished steel with particular properties. Commodities in the agricultural world are subject to availability and price fluctuations. Industrial commodities also experience supply and demand effects on price. Commodities that are traded on exchanges show daily price variations, and buyers need to decide whether to buy forward or hand to mouth as well as decide on hedging strategies.

The purchases of large commodity buyers, such as Nestle for coffee and cocoa and Coca Cola for sugar, will affect market prices. Commodity supply managers need to be fully aware of market conditions. Supply and demand, price movements, and proper timing of acquisition commitments are critical. Semiprocessed materials—steel sheets instead of ingots, frozen pork bellies instead of hogs, cocoa butter instead of beans—tend to move in price as the basic raw material moves with a producer's margin added.

Frequently labeled converters, suppliers of semiprocessed materials often are much smaller companies than the providers of their raw materials. Converters may find themselves squeezed between their suppliers and customers, each of which is trying to off-load the risk of unfavorable price movement.

3. Parts, Components, and Packaging

It is unusual for an assembler to make all of its products' parts and components itself. Therefore, it is common to depend on suppliers to provide the necessary parts, components, and packaging. Design engineers and design experts determine what parts and components to buy and which to make in-house. They also decide whether to design standard parts and components into the product or to specify custom design. The advantage of standard parts and components is their ready availability. The disadvantage is the ease of copying. Motorola for many years had a very high percentage of custom-designed electrical and electronic components in their product line. While affording duplication protection, this practice also delayed new product introduction and increased component costs. Therefore, a major initiative was undertaken to get engineers to design out of suppliers' catalogs. Failure to capture market share led Google to acquire the company to take advantage of Motorola's patents and expertise. The company was renamed Motorola Mobility–A Google Company, but was sold to Lenovo in 2014, thereby providing Lenovo a global supply chain and access to the smartphone market.

Since product design is a major influencer of product cost and speed to market, early supplier involvement (ESI) is a fruitful concern for this category.

Packaging is another specialized requirement, with major disposal, environmental, and transportation implications. Since packaging is discarded by the purchaser, it has potential environmental impact. Yet the package has to protect its contents as it finds its way from product manufacturer to final user. Damage during transport is a cost few parties are willing to assume. For some consumer items, such as cosmetics, the package can be a significant sales influencer. For a number of items, the packaging may be worth more than its contents: for example, beverage containers, including beer. For consumer items, marketers, packaging designers, and packaging engineers are concerned with the aesthetic, sales appeal, labeling, regulatory, and safety aspects. Specialty packaging suppliers may for a fee or as a free service offer advice on various packaging options. For nonconsumer goods, the primary packaging concerns are likely to be cost, environmental impact, and adequate contents protection given the types of handling and transportation modes the packaged goods will experience.

4. Maintenance, Repair, and Operating Supplies

Every organization has MRO requirements. Even the one-person office needs paper, IT, janitorial supplies, and so forth. For some companies MRO requirements are huge. Syncrude, the world's largest oil sands operator, has over 150,000 stock keeping units (SKUs) in its MRO category. For many organizations, because of the diversity of the MRO category and the large number of relatively small requirements (C items), the challenge is keeping acquisition costs down relative to the value of what is purchased. It doesn't make sense to spend $500 acquiring one $3 item. Therefore, MRO acquisition deals with many small value purchases (SVPs) and SVPs are linked with the MRO category. Typical supply solutions include systems contracting wherein one supplier is chosen to provide a large variety of products—for example, all office, plumbing, or electrical supplies on a daily or twice weekly delivery schedule. Designated employees will order their department's needs electronically from a catalog, and the supplier provides accounting with a biweekly detailed invoice providing specific account totals by department. Letting users order their own needs directly saves time and acquisition cost. Acquisition expertise is required to identify the needs, to select a supplier, to develop a contract, and to monitor performance.

5. Capital Assets

Capital assets are long-term assets that are not bought or sold in the regular course of business, have an ongoing effect on the organization's operations, have an expected use of more than one year, involve large sums of money, and generally are depreciated. Assets may be tangible or intangible. Historically, tangible assets (land, buildings, and equipment) have been the primary focus of managerial attention because they were the key drivers of wealth. Today, intangible assets (patents, copyrights, ideas, and knowledge) are important generators of wealth. Intangible assets are especially challenging because traditional accounting procedures do not include valuation methods for intangibles.

Capital expenditures are the result of investment and strategic decisions as opposed to expenses and are shown on the balance sheet as assets. Accountants create separate capital budgets, calculate depreciation, and advise on tax implications of capital purchases. Financing capital purchases requires special attention. Capital equipment can be acquired new or used and may be purchased outright or leased.

According to the U.S. Census Bureau, U.S. businesses typically invest between $1 and $1.5 trillion annually in new and used capital goods. In a weak economy, businesses tend to cut back on capital investments and in a strong economy capital expenditures flow again. The impact of such behavior on the sustainability of the supplier is one area of concern for supply managers when they evaluate suppliers. Too little investment or inconsistent investment in capital assets may signify serious organizational problems that will affect the supplier's ability to deliver quality goods or services in the long term.

The Challenge of Procuring Capital Assets The acquisition of capital goods may represent a key strategic move for an organization that could affect its competitive advantage for years to come. Or it could be a routine matter of no great consequence. In capital intensive industries such as mining or airlines, the acquisition of capital goods represents one of the single largest purchase categories and one of the greatest opportunities for supply to affect top-line (revenue) and bottom-line growth. A major nuclear power plant may take a decade to plan and build and may cost billions. Capital purchases are routine for a rapidly growing fast-food chain that may start up and equip hundreds of store locations per year. Companies with large fleets of cars may turn over one-third of the fleet each year and have a fleet manager assigned to decide which vehicles to acquire, how to dispose of vehicles, and select insurance and maintenance providers.

The risks associated with the acquisition of capital assets can be high. From the budgeting process to the design of equipment or buildings, determination of location for real estate purchases, and decisions about enterprisewide hardware and software, many factors play into the ultimate success or failure of a capital project. Clearly defined supply objectives that are linked to, and aligned with, organizational strategy and supported by robust supply processes are as important to successful capital acquisition and management as they are to noncapital purchases. Because of the high dollar amount and the long-term consequences of many capital projects, the application of tools and techniques such as enterprisewide spend analysis; standardization of equipment, including hardware and software; globalization of processes; and cost visibility are important.

The strategy for a specific capital acquisition depends on a number of factors, including the frequency of the purchase, the projected total cost of ownership, the amount and timing of cash flows, and the potential impact of the purchase on business operations.

For example, if assets are replaced at regular intervals, it makes sense to form a close working relationship with the supplier and focus on continuous improvement. At the U.S. Postal Service, for example, the mission of the organization is universal service at a reasonable cost in a timely manner. To achieve this mission consistently, large volumes of letters and packages must be sorted accurately and quickly. Therefore, sorting equipment is a strategic capital acquisition for the Postal Service. Because of design requirements and the desire for standardized equipment across the national organization, only a few suppliers are available. The category management team works closely with these suppliers to develop the specification, manage the cost structure, and deliver equipment in a shortened cycle time that delivers consistent quality, operating speed, and lowest total cost of ownership.

For one-time or infrequent high-value purchases, total cost of ownership analysis of the purchase and of the total supply chain costs is appropriate. There are many costs beyond purchase price that affect the true "cost to the organization" of any particular buy and especially for capital assets. A generally accepted figure is that the purchase price makes up from 30 percent to 50 percent of the total cost of ownership (TCO) of a capital purchase. Other factors, such as maintenance and repair costs, operating costs, downtime, and yield play key roles. Supply personnel must acquire the skills and knowledge necessary to develop total cost of ownership models that estimate and capture costs throughout the supply chain. Nonroutine capital asset acquisition may require a cross-functional project team representing users, marketers, designers, financial experts, and supply experts. If appropriate expertise is lacking internally, outside consultants may be brought in.

New Technology—New Equipment Competitive advantage stems from product or service differentiation or low-cost production. New technology frequently permits an organization to gain competitive advantage on both grounds—different products and services at significantly lower cost. New technology is, therefore, of significant strategic interest to most organizations. And new technology almost always implies new equipment and new processes. It is this strategic dimension of new equipment acquisition that has traditionally been overlooked by supply. Intellectual property rights, speed of acquisition, installation and debugging, continuing supplier support for operational performance and upgrades, and development of the next generation of technological advances become prime matters of corporate concern.

For example, in the semiconductor industry, capital equipment purchases normally represent the largest single percentage category of all purchase dollars. At Intel, the goal is to tie capital equipment purchasing and equipment service to performance-based contracting. Thus, the supplier gets paid for uptime and quality output. The more the running time exceeds agreed-to output goals, the greater the rewards for the supplier. Future plans are driven by the need for continuous improvement in cost per wafer and number of wafers per year per machine. Only a few key supplier partners are included in Intel's longer-range technology road maps planning process—looking five years out. Total cost of ownership, not just the cost of the equipment itself, drives future technology decisions. The corporate team approach is required to manage this process and exceptionally capable individuals need to represent supply on the corporate team.

Equipment purchases involve, in part, engineering and production considerations and, in part, factors largely outside the scope of these functions. From the former standpoint, there