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# Purchasing Must Become Supply Management

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The stable way of business life many corporate purchasing departments enjoy has been increasingly imperiled. Threats of resource depletion and raw materials scarcity, political turbulence and government intervention in supply markets, intensified competition, and accelerating technological change have ended the days of no surprises. As dozens of companies have already learned, supply and demand patterns can be upset virtually overnight.

How can a company guard against disastrous sup-

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*In many companies, purchasing, perhaps more than any other business function, is wedded to routine. Ignoring or accepting countless economic and political disruptions to their supply of materials, companies continue to negotiate annually with their established networks of suppliers or sources. But many purchasing managers' skills and outlooks were formed 20 years ago in an era of relative stability, and they haven't changed. Now, however, no company can allow purchasing to lag behind other departments in acknowledging and adjusting to worldwide environmental and economic changes. Such an attitude is not only obsolete but also costly.*

*In this article, the author offers pragmatic advice on how top management can recognize the extent of its own supply weakness and treat it with a comprehensive strategy to manage supply. He leads the reader step by step from the roots of the problem to the implementation of a solution.*

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ply interruptions and cope with the changing economics and new opportunities brought on by new technologies? What capabilities will a profitable international business need to sustain itself in the face of strong protectionist pressures? Almost every kind of manufacturer will have to answer these questions. Some companies have already responded to the growing pressures. For example:

□ Finding that purchasing outlays had increased in less than one year from 40% to 70% of the cost of goods sold, one European office-equipment manufacturer began to rely more heavily on American and Japanese suppliers, revise its materials planning system to reduce in-process inventories, and require its divisions to add people with electronics and foreign language skills to their purchasing staffs.

□ Through contracts that include long-term shipping charters and run to 1988 with suppliers in countries as distant as Brazil, the Japanese steel industry has secured an 18% cost advantage over its chief U.S. and European competitors.

□ Hoechst (the German petrochemical giant) has established ties to Kuwait and DuPont recently acquired Conoco as part of their new acquisition strategies. This reflects a long-term approach to supply security that other chemical companies like Dow Chemical in the United States and BASF in Europe have used to good advantage.

□ Cabot Corporation, faced with growing scarcity of chromium, vanadium, niobium, titanium, and other metals critical to its operations, set up a mineral resources division that developed an overall corporate supply strategy and explored new options, ranging from the purchase of ore in the ground to the start-up of joint ventures for primary metal processing. Cabot also acquired a London-based trading company to supplement existing purchasing skills with special trading expertise and access to the London metals market.

□ U.S. auto manufacturers who customarily relied on domestic materials procurement are now reevaluating their supply schemes and broadening their scope of potential suppliers. Ford not only manufactures parts of its "world car," Erika, in several foreign subsidiaries but also buys transmission axles from its Japanese subsidiary, Toyo Kogyo. Chrysler, which was sourcing 1.7-liter Omni engines from Volkswagen as long ago as 1978, now buys 2.6-liter engines from Mitsubishi. Predictions are that by 1990 the U.S. car industry will source 35% to 40% of its parts and components from abroad; 15 years ago it sourced only 5% from other countries.

To ensure long-term availability of critical materials and components at competitive cost, a host of manufacturers will have to come to grips with the risks and complexities of global sourcing. Others that already source on a global basis must learn to cope with uncertainties and supply or price disruptions on an unprecedented scale. Instead of simply monitoring current developments, management must learn to make things happen to its own advantage. This calls for nothing less than a total change of perspective: from purchasing (an operating function) to supply management (a strategic one).

Whenever a manufacturer must procure a volume of critical items competitively under complex conditions, supply management is relevant. The greater the uncertainty of supplier relationships, technological developments, and/or physical availability of those items, the more important supply management becomes.

## Diagnosing the Case

A company's need for a supply strategy depends on two factors: (1) the strategic importance of purchasing in terms of the value added by product line, the percentage of raw materials in total costs and their impact on profitability, and so on; and (2) the complexity of the supply market gauged by supply scarcity, pace of technology and/or materials substitution, entry barriers, logistics cost or complex-

ity, and monopoly or oligopoly conditions (see *Exhibit I*). By assessing the company's situation in terms of these two variables, top management and senior purchasing executives can determine the type of supply strategy the company needs both to exploit its purchasing power vis-à-vis important suppliers and to reduce its risks to an acceptable minimum. Attractive new options, or serious vulnerabilities, or both, may come to light as the assessment explores questions like these:

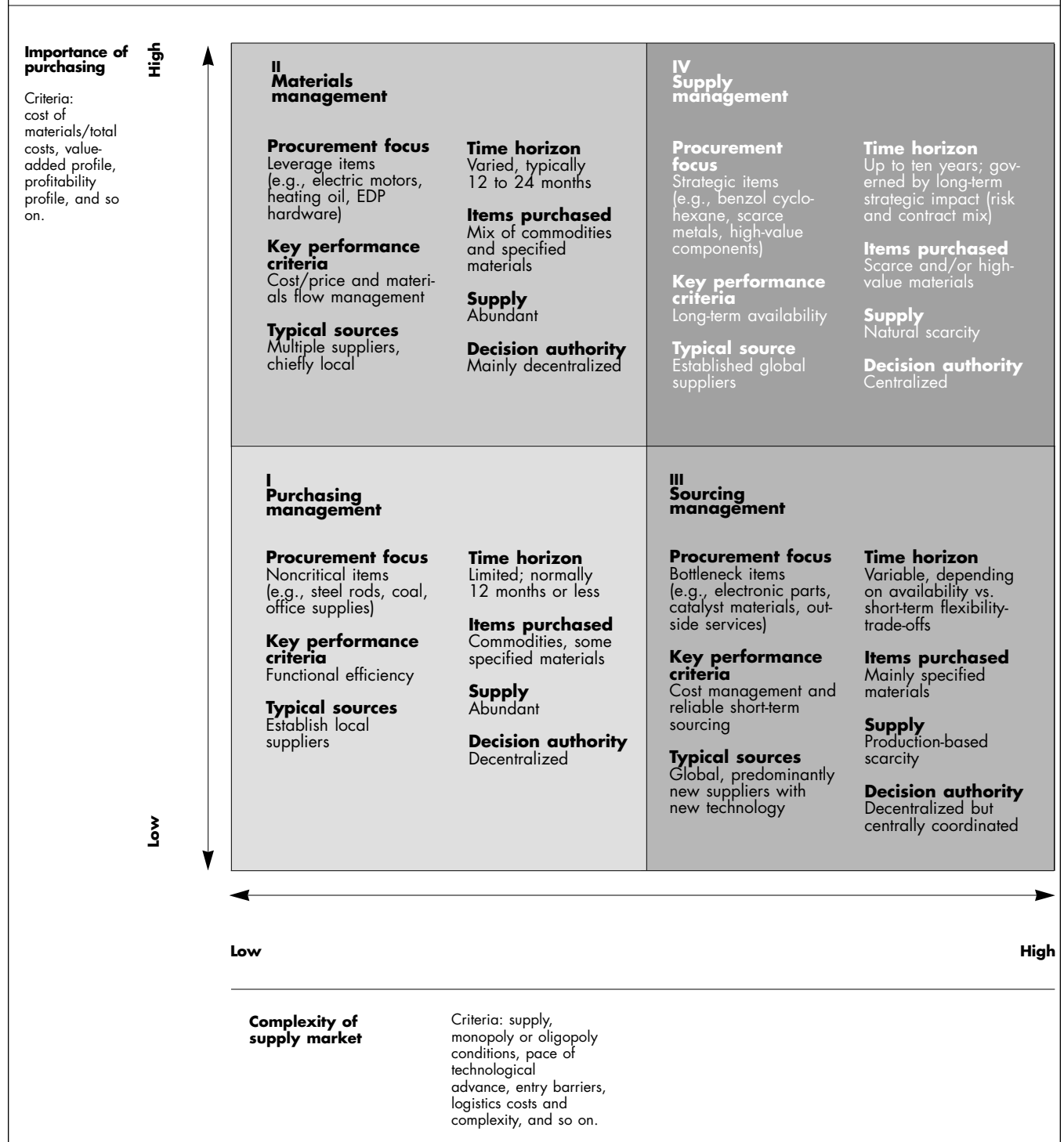
**1. Is the company making good use of opportunities for concerted action among different divisions and/or subsidiaries?** Combining the supply requirements of different divisions can increase the corporation's total buying clout. One international transportation company was buying three kinds of fuel separately: bunker oil for shipping, jet fuel for airfreight, and gasoline for trucks. Only after consolidating and combining these volumes at the corporate level could the company bring its true bargaining weight to bear.

**2. Can the company avoid anticipated supply bottlenecks and interruptions?** When an automotive parts maker analyzed its sintered metal components supply market, from which it had been sourcing for years, it discovered that political instability was jeopardizing its supply. The company's top management promptly ordered a change in purchasing policy to build up alternative domestic sources.

**3. How much risk is acceptable?** Vendor mix, extent of contractual coverage, regional spread of supply sources, and availability of scarce materials all contribute to the company's supply risk profile. A company can often take action to lessen unacceptable risk. For example, a company that meets annual materials requirements exclusively through long-term contracts may achieve substantial savings through the use of "evergreen" contracts (annual agreements) that include a rollover option. Conversely, a manufacturer that relies solely on spot purchases may do well to mix spot purchases and supply contracts.

**4. What make-or-buy policies will give the best balance between cost and flexibility?** If the company covers a large percentage of its supplies from sources it owns, it will be in a much better negotiating position to cover the remainder of its outside requirements than its less-integrated competitors. Dow Chemical, BASF, and DuPont have all reduced their supply vulnerability through backward integration in response to long-term considerations. On the other hand, the company may find it more profitable to source outside if key suppliers have chronic overcapacity.

# Exhibit I Stages of Purchasing Sophistication



5. To what extent might cooperation with suppliers or even competitors strengthen long-term supply relationships or capitalize on shared resources? Italy's Alfa Romeo and Japan's Nissan share the production of certain critical car com-

ponents that they could not produce cost-effectively on their own. General Motors is increasingly involving suppliers early in the design process in order to ensure better quality, lower cost, and "just in time" production.

Exhibit II <b>Classifying Purchasing Materials Requirements</b>			
Procurement focus	Main tasks	Required information	Decision level
<b>Strategic items</b>	Accurate demand forecasting. Detailed market research. Development of long-term supply relationships. Make-or-buy decisions. Contract staggering. Risk analysis. Contingency planning. Logistics, inventory, and vendor control.	Highly detailed market data. Long-term supply and demand trend information. Good competitive intelligence. Industry cost curves.	Top level (e.g., vice president, purchasing).
<b>Bottleneck items</b>	Volume insurance (at cost premium if necessary). Control of vendors. Security of inventories. Backup plans.	Medium-term supply/demand forecasts. Very good market data. Inventory costs. Maintenance plans.	Higher level (e.g., department heads).
<b>Leverage items</b>	Exploitation of full purchasing power. Vendor selection. Product substitution. Targeted pricing strategies/negotiations. Contract/spot purchasing mix. Order volume optimization.	Good market data. Short- to medium-term demand planning. Accurate vendor data. Price/transport rate forecasts.	Medium level (e.g., chief buyer).
<b>Noncritical items</b>	Product standardization. Order volume monitoring/optimization. Efficient processing. Inventory optimization.	Good market overview. Short-term demand forecast. Economic order quantity inventory levels.	Lower levels (e.g., buyers).

## Shaping the Supply Strategy

To minimize their supply vulnerabilities and make the most of their potential buying power, a number of European companies have successfully used a four-stage approach to devise strategies. The approach has given them a simple but effective framework for collecting marketing and corporate data, forecasting future supply scenarios, and identifying available purchasing options as well as for developing individual supply strategies for critical items and materials.

Following this approach, the company first classifies all its purchased materials or components in terms of profit impact and supply risk. Next it analyzes the supply market for these materials. Then it

determines its overall strategic supply position. Finally, it develops materials strategies and action plans.

### Phase 1: Classification

The profit impact of a given supply item can be defined in terms of the volume purchased, percentage of total purchase cost, or impact on product quality or business growth. Supply risk is assessed in terms of availability, number of suppliers, competitive demand, make-or-buy opportunities, and storage risks and substitution possibilities. Using these criteria, the company sorts out all its purchased items into the categories shown in *Exhibit II*: strategic (high profit impact, high supply risk), bottleneck (low profit impact, high supply risk), leverage (high profit impact, low supply risk), and noncritical (low profit impact, low supply risk).

Each of these four categories requires a distinctive purchasing approach, whose complexity is in proportion to the strategic implications. The company may need to support supply decisions of strategic items with a large battery of analytic techniques, including market analysis, risk analysis, computer simulation and optimization models, price forecasting, and various other kinds of microeconomic analysis. Decisions about bottleneck items may require specific market analysis and decision models for resolution, while vendor and value analysis, price forecasting models, and decision models may come into play on issues affecting leverage materials. Where noncritical items are concerned, simple market analyses, decision policies, and inventory optimization models will normally suffice. As companies like Akzo, the giant Dutch chemical producer, have found, this classification permits a more differentiated and hence better focused approach to the analysis of supply market data.

Shifts in supply or demand patterns can alter a material's strategic category. In many companies over the past few years, for example, coal has graduated from noncritical to strategic. Therefore, any purchasing portfolio classification calls for regular updating.

### Phase 2: Market Analysis

Next the company weights the bargaining power of its suppliers against its own strength as a customer (see *Exhibit III*). It systematically reviews the supply market, assessing the availability of strategic materials in terms of both quality and quantity, and the relative strength of existing vendors. The company then analyzes its own needs and supply lines to gauge its ability to get the kind of supply terms it wants.

Of the contrasting criteria of supplier and company strength listed in *Exhibit III*, some are self-explanatory. But six call for special comment.

*Suppliers' capacity utilization.* This criterion indi-

cates the risk of supply bottlenecks. In a cyclical upswing, with suppliers' production running at 90% of capacity, the probability of a bottleneck in the supply of a strategic item is extremely high. Electronics manufacturers that have neither their own chip-production facilities nor adequate contractual coverage have nightmares whenever demand for microchips heats up. A European aircraft manufacturer had specified high-grade titanium alloys for certain applications but had failed to reckon with potential supply bottlenecks. After a series of production setbacks and cost increases, it has now switched back to specialty steels.

*Supplier's break-even stability.* A supplier that achieves break-even at below 70% capacity utilization can ultimately deliver at lower cost than one who breaks even at 80% utilization. For the same reason, however, the first supplier will prove a tougher bargainer, for it can more easily delay negotiations and accept capacity underutilization.

*Uniqueness of suppliers' product.* This is a function of natural scarcity (as in certain strategic metals and minerals), high technological sophistication (like the 256K RAM chip), and/or entry barriers in the form of high R&D or facility investments. If a product is unique, the probability is less that alternative sources or suppliers will appear or that supplier competition will force cost reductions.

*Annual volume purchased and expected growth in demand.* Volume, the main determinant of the company's overall bargaining power, is critical because economies of scale in purchasing often yield a decisive competitive cost advantage. In the case of many automotive parts, cost reductions as large as 4% can often be achieved by doubling the volume allocated to a given supplier.

*Past variations in capacity utilization of main production units.* A company can judge the built-in flexibility of its supply coverage from past variations in demand resulting from sales strategies and promotions, changes in the order backlog, or overall economic conditions. If the company plans a major expansion or an aggressive sales strategy for a product line where supplies are tight or suppliers' capacities fully used, it may be able to cover the higher materials requirements only by paying a price premium. In turn, projected profits may decline.

*Potential costs in the event of nondelivery or inadequate quality.* The higher such costs and the greater the risk of incurring them, the less latitude the company has for rapidly shifting supply sources or delaying negotiations or contracts. These costs influence required inventory levels and safety stocks, but they mainly affect production. Changing a source of supply might, for example, make it necessary to modify the production process. In the case of materials

for highly automated production processes (such as certain alloy steels or carbide tools), the costs of such modification could be prohibitive.

No list of evaluation criteria is equally applicable to every industry: a petrochemicals producer and an automobile manufacturer would each have its own modifications to those shown in the exhibit. Moreover, the relative importance of different criteria may vary with technological change or with shifts in the industry's competitive dynamics. Careful definition of the criteria of both supplier and company strength is a prerequisite to accurate market analysis.

### **Phase 3: Strategic Positioning**

Next the company positions the materials identified in phase 1 as strategic in the purchasing portfolio matrix (see *Exhibit IV*). It can then identify areas of opportunity or vulnerability, assess supply risks, and derive basic strategic thrusts for these items. The purchasing portfolio matrix plots company buying strength against the strengths of the supply market and can be used to develop counterstrategies vis-à-vis key suppliers—an approach sometimes called “reverse marketing.”

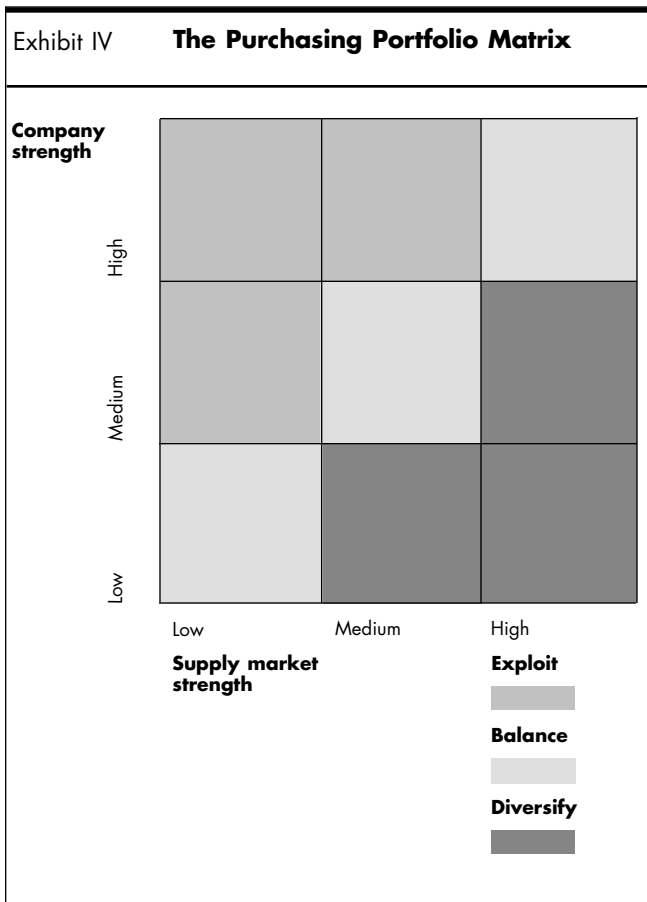
The cells in the purchasing portfolio matrix correspond to three basic risk categories, each associated with a different strategic thrust. On items where the company plays a dominant market role and suppliers' strength is rated medium or low, a reasonably aggressive strategy (“exploit”) is indicated. Because the supply risk is slight, the company has a better chance of achieving a positive profit contribution through favorable pricing and contract agreements. Even so, it has to take care not to exploit the advantage so aggressively that it jeopardizes long-term supplier relationships or provokes counterreactions by insisting on rock-bottom prices in times of market discontinuity.

On items where the company's role in the supply market is secondary and suppliers are strong, the company must go on the defensive and start looking for material substitutes or new suppliers (“diversify”). It may have to increase spending on market research or supplier relations, or even consider backward integration through major investments in R&D or production capacities. In short, the company needs its supply options.

For supply items with neither major visible risks nor major benefits, a defensive posture would be over-conservative and costly. On the other hand, undue aggressiveness could damage supplier relations and lead to retaliation. In this case, a company should pursue a well-balanced intermediate strategy (“balance”).

Usually, a company will find itself in different roles with respect to different items and suppliers. When

Exhibit III <b>Purchasing Portfolio Evaluation Criteria</b>		
	Supplier strength	Company strength
1	Market size versus supplier capacity	Purchasing volume versus capacity of main units
2	Market growth versus capacity growth	Demand growth versus capacity growth
3	Capacity utilization or bottleneck risk	Capacity utilization of main units
4	Competitive structure	Market share vis-à-vis main competition
5	ROI and/or ROC	Profitability of main end products
6	Cost and price structure	Cost and price structure
7	Break-even stability	Cost of nondelivery
8	Uniqueness of product and technological stability	Own production capability or intergration depth
9	Entry barrier (capital and know-how requirements)	Entry cost for new sources versus cost for own production
10	Logistics situation	Logistic



it can bargain from a position of strength, it should press for preferential treatment. Bargaining from weakness, the company may have to offer inducements—

longer-term contract obligations, for example, or higher prices—in order to ensure an adequate supply.

#### Phase 4: Action Plans

Each of the three strategic thrusts has distinctive implications for the individual elements of the purchasing strategy, such as volume, price, supplier selection, material substitution, inventory policy, and so on (see *Exhibit V*).

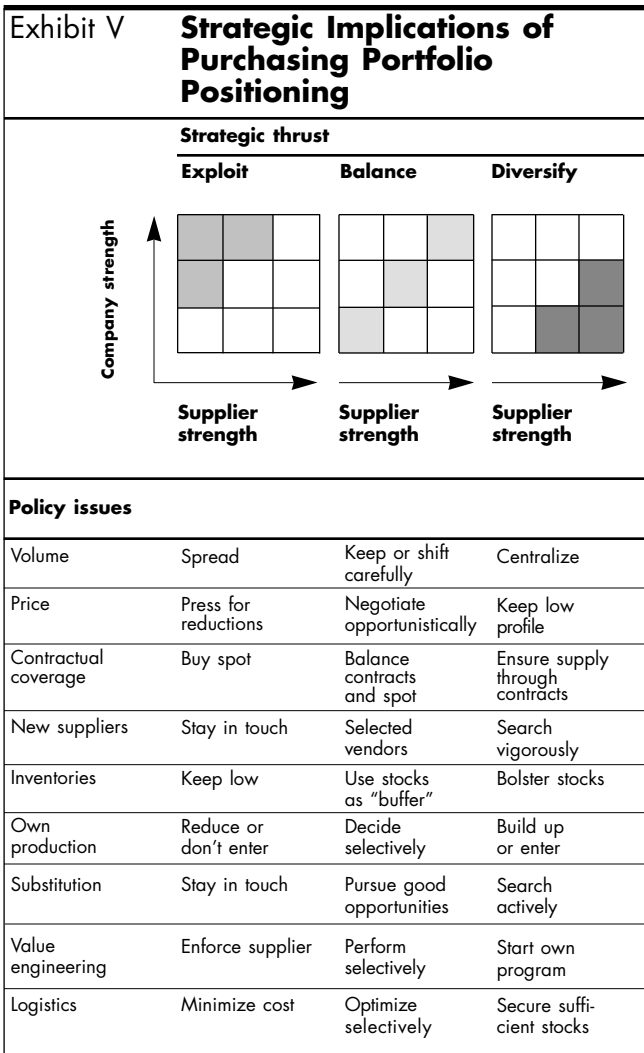
In the short term, for strategic items where the supplier's strength outweighs the company's and the indicated strategy is diversification, the company should consolidate its supply position by concentrating fragmented purchased volumes in a single supplier, accept high prices, and cover the full volume requirements through supply contracts. To reduce the long-term risk of dependence on a single source, however, the company should also search for alternative suppliers or materials or even consider backward integration to permit in-house production. On the other hand, if the company is stronger than the suppliers, it can spread volume over several suppliers, exploit price advantages, increase spot purchases, and reduce inventory levels.

In this phase, then, the company should explore a range of supply scenarios in which it lays out its options for securing long-term supply and for exploiting short-term opportunities; clearly define respective risks, costs, returns, and strategic implications; and develop a preferred option with objectives, steps, responsibilities, and contingency measures laid out in detail for top management approval and implementation. The end product will be a set of systematically documented strategies for critical purchasing materials that specify the timing of and criteria for future action.

#### Practical Applications

The usefulness of the purchasing portfolio approach in a variety of industrial situations can be seen in the diverse experiences of four large companies. Not long ago a welding materials producer with plants and sales operations all over Europe found its profits squeezed by increased competition and slackening market growth. Searching for ways to improve the picture, the company found that supplies were critical to the production of its welding wires and electrodes. Together, just five out of the 470 different items it purchased accounted for more than 60% of the company's total purchasing volume of \$135 million. Taking into account demand growth, quality standards, and logistics, the company then analyzed the European market for these five items in light of its own plant-by-plant requirements. A third





step determined the company's position against a wide range of individual suppliers and assessed the risk of increasing the share sourced from each one.

Finally, the company developed several strategic supply scenarios, each involving a different mix of suppliers and different assumptions about price, volume, and risk. The scenarios ranged from very low risk (total dependence on well-established sources) to very high (most purchases from lesser-known, geographically dispersed suppliers). Cost-benefit analyses of each enabled management to pinpoint several opportunities for substantial improvement. On one key item alone, electrode wire, the company's potential annual savings ranged from \$1.5 million to \$6.3 million, or 3% to 12% of the total cost. Supply strategies the company worked out for other key items resulted in an overall saving of 10% on purchased materials, adding some 3% to 4% to the company's pretax profits. Action plans and decision and monitoring rules developed for each item enabled buyers

to implement the new sourcing strategy and permitted management to monitor purchasing activities regularly, in some cases on a day-by-day or bid-by-bid basis.

A large U.S.-based maker of electrical equipment categorized castings as a key strategic purchased item and systematically analyzed its own demand in terms of the annual volume and relative complexity of each type of casting. It assessed, foundry by foundry, the capabilities of each potential supplier and decided, by comparing alternative supply scenarios, which was the best fit. The resulting new mix of outside suppliers reduced the company's outlays for castings by 5% to 15% and significantly improved its competitive cost position.

Anxious to reduce the risks associated with current sources of feedstock supply, a multinational chemical company revamped its entire purchasing strategy and organization. Out of more than 5,000 purchased items, the company defined 75 as strategic or bottleneck feedstocks. Detailed analysis of both demand and supply confirmed that, thanks to the sheer volume of its purchases, the company enjoyed a strong position in most feedstock supply markets. Its risk profile, however, gave real cause for concern.

Accordingly, the company spread its hydrocarbons procurement among petroleum- and coal-based feedstocks; balanced its geographic base among Middle Eastern, African, North Sea, North American, and Latin American sources; changed its contracts-to-spot-purchases ratio; optimized its make-or-buy mix by integrating backward; and began to rely on wholly owned subsidiaries for a bigger share of its feedstock requirements. In addition, a corporate-level review revealed attractive trade-off and substitution opportunities, which the corporation soon set about exploiting, once it had changed and upgraded its purchasing organization and systems in order to do so.

Faced with sharp rises in the labor and overhead costs of producing high-precision parts in-house, a Europe-based heavy-equipment maker decided to review its make-or-buy strategy. Examining the supply market, it identified a group of obscure, small manufacturers of precision parts that had begun to use dedicated, numerically controlled equipment. Thanks to low overhead and economies of scale achieved through specialized production, they could supply high-quality parts at prices 10% to 20% below the cost of in-house production. In consequence, the company shifted from making the parts to buying them.

## Strengthening the Organization

Few companies today can allow purchasing to be managed in isolation from the other elements of their

overall business systems. Greater integration, stronger cross-functional relations, and more top-management involvement are all necessary. Every facet of the purchasing organization, from systems support to top-management style, will ultimately need to adapt to these requirements. Concrete changes in the organization will be required to establish effective organizational relations, provide adequate systems support, and meet the new staff and skills requirements.

### **Effective Relations**

To exploit the company's full buying and bargaining power, the purchasing function must reflect the overall corporate setup. In particular, top management must decide to what extent it should centralize or decentralize the function.

The issue is not clear-cut. While centralization augments a company's purchasing clout, it is also more inflexible. To find the right balance, companies must carefully consider trade-offs between clout and flexibility. One diversified multinational corporation, for example, successfully centralized purchasing of basic materials but found that it could not do the same with technical goods because of heterogeneous production facilities, varying national standards, and differentiated service and parts demands.

Another important issue is purchasing's position in the corporate structure. Should the company treat it as a function of production or of operating divisions? Should management set it up as a central independent department or division or position it as part of the materials management function or even of a supply division? The answer will depend on factors such as volume and concentration of purchased goods as well as on the corporation's structure and complexity.

Different corporate philosophies lead to different solutions. One international chemical company, for example, formed a central supply group with worldwide responsibility for all raw materials, feedstocks, and energy-related activities, while a major competitor went for all-out decentralization and gave each division its own purchasing group. Though diametrically opposed, both solutions made sense in their respective contexts.

The purchasing department's structure should reflect supply-product market affinities and permit staff with specialized competence to take the lead in working out strategies for specific items. The company should encourage flexibility and entrepreneurship in its managers within the constraints of the overall corporate structure.

### **Systems Support**

Too often the purchasing department receives information on the company's business plans and objec-

tives that is incomplete or improperly geared to the tasks and time horizons of strategic supply management. Purchasing executives are usually informed of major expansion and investment projects as well as month-to-month production requirements but often lack adequate operating information with a three- to six-month time horizon, which would provide early warning of short- to medium-term demand fluctuations. The purchasing department needs these data for negotiating prices, rescheduling supply quantities, and balancing raw material inventories in response to cyclical demand swings.

In the absence of such data, supply bottlenecks, short-term demand fluctuations, and ad hoc purchasing decisions are inevitable. In turn, the company incurs higher time and money costs, penalties for unfulfilled contract terms, excessive inventories, and disruption in purchasing activities, all of which force buyers to spend their time troubleshooting.

Complex companies with numerous products, multiple plants, and substantial production for stock (as in the consumer goods or chemical industries) are more vulnerable than are companies with a single product line and/or considerable job-order production, such as industrial equipment manufacturers. In either case, tailor-made systems support will be called for. Such support might include:

- Improvement of operational flexibility through a rolling demand forecast system with a three- to six-month time horizon, coupled with systematic evaluation of supply market data.

- Improved efficiency, shortened through put time, and reduction in costs and manual paperwork through EDP-supported purchasing planning, information, and disposition systems.

- Integration of purchasing systems with other corporate systems, such as liquidity planning, and/or with the corresponding planning and disposition systems of key suppliers. The most familiar example is the so-called Kanban system, which allows the Japanese automaker Nissan to work with practically no parts or work-in-process inventories. Recently, however, U.S. and European car manufacturers are moving in the same direction.

- Introduction of proven purchasing analysis approaches, such as commodity analysis or value analysis, to help develop action plans for nonstrategic purchased items with limited supply complexity and risk but up to 15% savings potential.

Improved systems support frees buyers and management from preoccupation with day-to-day problems and enables them to focus on long-term analytic work and planning. Additional benefits include price reduction or savings, inventory reduction, reduced cler-

ical work, and better delivery and service.

The company will realize these benefits only if it uses the systems effectively. It must foster consistent, cross-functional information flows and demands and induce line managers to supply the required data for the purchasing information system. (One way to reduce their instinctive resistance is to show them that most of the "new" data already exist and need only be recast in an appropriate format.) Finally, management must make certain that any major new systems are user-friendly.

### **Staff & Skill Requirements**

To meet the demands of the new supply strategy, the company must also upgrade the skills and experience it requires of key purchasing people. One big international company vastly improved the status of the purchasing division by promoting a dynamic sales executive with broad international expertise to head it. To loosen its design department's grip on supplier selection decisions, another organization hired away an expert applications engi-

neer from a specialized process-control manufacturer and put him in charge of the purchasing department. The result: substantial savings through standardization and alternative sourcing of process-control equipment.

Despite the potential leverage to be obtained through improved purchasing staff and skills, hasty moves in this area can backfire, especially if they disrupt close relationships with suppliers. Top management should foster a constructive atmosphere and attitude among purchasing staff before undertaking any radical staff changes.

Progress toward effective supply management can only be gradual, and the company will have to surmount many obstacles to implementation along the way. But the rewards are well worth the effort. An attitude of "purchasing as usual" will make the company vulnerable to competitive pressure; but enhanced strategic awareness, greater flexibility, and stronger entrepreneurial thinking in the supply area can improve the supply security and lower the input costs of any industrial company.

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