

## **SECTION II. B. Industry Perspective**

This section presents the results of industry benchmarking and our review of industry supplier evaluation programs.

### **1. Benchmarking**

The benchmarking phase of the study was accomplished by conducting on-site visits and by reviewing information in the Arthur D. Little Supply Chain Management practice database.

The names of companies we visited during the course of the study and the industries they represent are listed below. Notice that while manufacturing is heavily represented, industries dealing with electronics, process industries and companies performing logistics-like activities were included in our research to provide both breadth and depth to our review.

#### **Companies Included in the Supplier Evaluation Database**

<b>Company Name</b>	<b>Industry Type</b>
Allen-Bradley	Process Controls Equipment Manufacturing
Baxter	Pharmaceutical Manufactng./Distrib.
Black and Decker	Consumer Goods Manufacturing
Boeing Defense & Space Group	Aerospace/Defense Manufacturing
British rail	Transportation
Fisher Scientific	Industrial Distribution
Ford Motor Co.	Automotive Manufacturing
McCormick & Co.	Consumer Goods Manufacturing
McDonnell Douglas	Aerospace/Defense Manufacturing
Mobil Corporation	Process Manufacturing
National Semiconductor	Electronics Manufacturing
Rockwell Defense Electronics	Aerospace/Defense Manufacturing
W.W. Grainger	Industrial Distribution
U.S. Postal Service	Transportation

Companies researched for benchmarking purposes included those producing consumer items as well as those in the defense contracting community. In addition, companies manufacturing component parts were also included since supplier certification is often performed down to the part level in a system.

A key finding of our industry research is that, in best-of-class supplier evaluation programs, there is a distinct supplier approval process keyed to associated risks. Also, the supplier approval process outcome results in a consolidation of suppliers, which is a necessary condition before a business relationship can take place.

## **2. Industry Supplier Evaluation Programs**

The information in this section is organized according to the key features we found in industry supplier evaluation programs. The nine key features, which were identified in companies that are recognized as “best of class” among supplier evaluation programs along with their purpose, scope, and selected implementation features are summarized in the following table:

Evaluation Program Component	Purpose	Scope	Selected Implementation Features
<b>Supply Base Management Process/ Supply Base Strategy</b>	<ul style="list-style-type: none"> <li>Align supply base strategy to corporate strategy</li> <li>Manage the supply base to achieve corporate strategy</li> <li>Manage the supply base to create leverage, achieve least total cost, gain competitive advantage</li> <li>Improve continuously</li> </ul>	Company-wide All materials, services, equipment	<ul style="list-style-type: none"> <li>Size of supply base, overall and within commodity segments</li> <li>Commodities Management Strategy</li> <li>Identification of key suppliers</li> <li>Long-term partnership strategies</li> <li>Just-in-time</li> <li>ISO 9000, Baldrige, other certification requirements</li> <li>Process control focus</li> </ul>
<b>Supplier Performance Measurement</b>	<ul style="list-style-type: none"> <li>Evaluate supplier performance on an ongoing basis</li> <li>Use supplier performance data for continuous improvement, total cost reduction</li> </ul>	Typically minimum measurements Quality of product materials/services provided Service performance Delivery performance Cost performance Overall commitment	<ul style="list-style-type: none"> <li>Measurement can apply to all suppliers</li> </ul>
<b>Supplier Performance Measurement Feedback (Evaluation)</b>	<ul style="list-style-type: none"> <li>To feedback supplier performance results for the purposes of improving supplier performance</li> </ul>	Strategic and Alliance Suppliers	<ul style="list-style-type: none"> <li>Cross-functional data sources</li> <li>Feedback in an annual meeting</li> <li>Development of corrective action plans</li> </ul>
<b>Supplier Quality System Assessment</b>	<ul style="list-style-type: none"> <li>Assure that the suppliers' quality systems and processes are documented and in use</li> </ul>	Comprehensive assessment of quality systems, often based on ISO 9000 or other systems	<ul style="list-style-type: none"> <li>Quality Process Self-Assessment Questionnaire</li> </ul>
<b>Item or Part-Level Certification</b>	<ul style="list-style-type: none"> <li>Identify parts or items that consistently meet statistical process control requirements</li> <li>Identify parts or items based on conformance to process that will not be subjected to incoming inspection</li> </ul>	All suppliers, but especially critical suppliers	<ul style="list-style-type: none"> <li>100% conformance to requirements</li> </ul>
<b>Total Cost Assessments</b>	<ul style="list-style-type: none"> <li>Determine the total cost of doing business in a supplier relationship</li> </ul>	All suppliers but especially critical suppliers	<ul style="list-style-type: none"> <li>Published guidelines and standards</li> <li>Formal new supplier education program</li> </ul>
<b>Supplier Evaluation and Development</b>	<ul style="list-style-type: none"> <li>Communicate supplier performance standards and requirements</li> <li>Educate suppliers on the supplier improvement process</li> </ul>	All suppliers, but especially critical suppliers	<ul style="list-style-type: none"> <li>Published guidelines and standards</li> <li>Formal new supplier education program</li> </ul>
<b>Supplier Approval</b>	<ul style="list-style-type: none"> <li>Identify the suppliers that are approved to buy from before orders are placed</li> </ul>	Company-wide Suppliers quality system Supplier's conformance to regulatory requirements Supplier's general business standing	<ul style="list-style-type: none"> <li>Depth of evaluation varies with risk</li> </ul>
<b>Supplier Recognition Programs</b>	<ul style="list-style-type: none"> <li>Honor the best performing suppliers</li> <li>Recognize outstanding contributions by a supplier employee</li> </ul>	Strategic and critical suppliers	<ul style="list-style-type: none"> <li>Plaques, certificates of appreciation, thank you notes</li> </ul>

**Figure IIB.1 : Key Features: Supplier Evaluation Program**

### **Supply Based Management Process/Supply-Based Strategy**

In terms of “best-of-class” benchmarking findings, the following three principles, derived from the first key feature listed above, stand out:

- World class supply chain orientation
- Supply base improvement strategy
- Explicit supply base management process

The emphasis on a world-class orientation moves organizations from a prescriptive “meet the spec” environment to a fully collaborative internal and external team environment which emphasizes process rather than specifications..The emphasis on developing an explicit supply base improvement strategy and management process raises the level of supplier performance, reduces supply chain costs, and moves staff and suppliers into new roles which change over time from a largely reactive to a proactive orientation that reinforces continued improvements. Conspicuous in this new perspective is a systems approach to delivery of world-class products and services.

### **Supplier Performance Measurement**

Ongoing supplier performance measurement is a central feature of supplier evaluation programs. The scope of application ranges from all suppliers to critical suppliers Supplier performance measurement is generally performed for a small number of critical data elements, such as quality, service, delivery, and cost. Each business unit defines what constitutes product quality, service, and delivery performance, as well as the appropriate measures for each of these.

Prior to beginning supplier performance measurements, the customer’s performance standards and requirements are communicated to suppliers. Standards include how a supplier will be rated and how ratings will be used and communicated.

Detailed profiles of ratings are generally available on-line. A supplier’s data is never shared with another supplier. Examples of these profiles are shown in the two following figures:



Category	Criteria		Current Month Results	Current Quarter Results	Current YTD Results
QUALITY	Total Units Sold		1,106	15,702	15,702
	Warranty Returns:	Units	5	48	48
		% of Total Units Sold	0.45%	0.31%	0.31%
		Cost \$	\$508	\$4,012	\$4,012
DELIVERY	Purchase Order Lines Delivered: (%)	Early	51.4%	42.4%	42.4%
		Late	14.3%	18.7%	18.7%
		On-Time	34.3%	38.9%	38.9%
	Shipments:	Total	27	294	294
		Shipping Errors	0	1	1
		Error Rate	0.0%	0.3%	0.3%
	Lead Time:	Prior Year End	2.5	12	12
		Current	3.5	0.08%	0.08%
		% Change	1.40	\$170	\$170
	Past Due Open Orders:	Total Open Order \$	\$38,375	\$369,653	\$369,653
		Total Past Due \$	\$1,900	\$16,698	\$16,698
		Past Due %	5.0%	4.5%	4.5%
COST	Invoices:	Total	34	333	333
		Invoice Errors	0	4	4
		Error Rate	0.0%	1.2%	1.2%
	Average Cost Change vs. Prior Year:				-0.87%
SALES	Our Cost		\$38,108	\$461,734	\$461,734
	Prior Year Cost		\$36,506	\$440,194	\$440,194
	% Change		4.4%	4.9%	4.9%

**Figure IIB.3: Supplier Performance Measurement Profile (Distribution)**

Measures in the “criteria” column of the report are accompanied by data in a format which has the capability to indicate existing trends. In addition to using measures applicable to operating units, the report also includes data in dollars--suitable for use by upper management.

### Suppliers Performance Measurement Feedback

Another key feature of a supplier evaluation program is focused on feedback processes and improvements in communication. Feedback to suppliers is a very important ingredient in an effective supplier evaluation program. This provides needed information on quality to suppliers for their own improvement processes. Best-in-class companies provide feedback to their suppliers on their performance results for the purpose of improving future performance. An effective supplier evaluation program will have to contend with both the nature of specific feedback as well as the frequency. Many organizations utilize a formal “report card” process to provide suppliers with feedback in a structured fashion. Many companies meet with their suppliers at least once a year to inform them of their evaluation results, identify areas of improvement, and in more advanced situations, develop an action plan for improvement. Companies also notify their suppliers more frequently by on-line services, telephone, or letter about their performance. This feedback is critical since

it gives both parties the opportunity to improve the product, reduce costs, and improve service

### **Supplier Quality System Assessment**

The foundation for a supplier evaluation program lies in an active, thorough, on-site evaluation of a supplier's approach to the installation and use of an effective quality system. Supplier quality systems assessments are often based on rigorous standards such as the ISO 9000 series of standards. A key feature of the ISO series is registration of a company or production element with a third party organization which monitors compliance to the registered standard. Purchasers of products and services from ISO registered companies are assured that the registered company has a documented quality system in place. Some approaches to assessment are developed in-house using ISO 9000 (or other applicable standards for the industry) or the Malcolm Baldrige National Quality Award criteria. The most objective approaches at this time rely on third-party certification including on-site evaluation, subsequent registration, and periodic re-evaluation.

### **Part-level Certification**

Part-level certification requires accurate historical data on supplier past performance. An important outcome, often not explicitly stated, is the change in the relationship which occurs as a result of becoming a certified supplier. Generally, companies requiring supplier certification often experience a decrease in the number of qualified suppliers. The remaining suppliers, have an opportunity to develop a more stable business relationship.

Supplier certification tends to bring increased benefits for both the certified supplier and the customer. For the supplier, it can mean additional business, single or lead source within a commodity area. For the customer, it can mean significant cost savings by using parts received from certified suppliers because certification can eliminate costly incoming inspection and associated costs. The best-in-class supplier evaluation programs usually certify to the item/part or family of parts level. Most companies have the goal of certifying all of their key parts and products. However, they typically start with a manageable number of critical parts and then expand the program to include all of the critical items as well as those that have the potential to reduce operating costs. Some companies interviewed during the course of the study had certified virtually all of their products or were on their way to certifying all critical parts.

### Total Cost Assessment

An emerging trend in the supplier evaluation arena is the use of a “total cost assessment” approach which attempts to capture all of the acquisition and consumption costs associated with doing business with a particular supplier. Acquisition costs are the costs of a supplier’s activities to process and deliver an order and supplier’s material and profit. Consumption costs are the costs of the customer activities--labor and overhead--to process a supplier’s shipment through the customer’s system. Effective total costs assessment processes usually rely on activity-based costing principles. Activity based costing techniques are used to acquire the best value by estimating the total costs of doing business with different suppliers. The “true” lowest bidder is sought--and bids account for all costs including quality, cost, and delivery. Customers identify historical non-productive costs resulting from supplier non-compliance with customer’s mode of operations. Some supplier non-productive events that are “charged” to the supplier are:

Quality Events	Scheduled Events
<ul style="list-style-type: none"><li>• Source rejection</li><li>• Inspection resubmittal</li><li>• Return to supplier</li><li>• Material review</li><li>• Shop floor rejection (latent defect)</li><li>• Corrective action request letter</li><li>• Supplier stop notice</li></ul>	<ul style="list-style-type: none"><li>• Early delivery</li><li>• Overshipment</li><li>• Late receipt</li></ul>

One important use of a total cost assessment is the adjustment of bid prices from suppliers using a Supplier Performance Index (SPI). The index is developed from a ratio that estimates the true cost of supplier bids. An example application of the Supplier Performance Index concept is illustrated in Figure IIB.4.

$$\text{SPI}^1 = \frac{\text{Material Cost} + \text{Nonproductive Cost}}{\text{Material Cost}}$$

Supplier	Supplier A	Supplier B	Supplier C
Quoted Price	\$1,000.00	\$1050.00	\$1025.00
X SPI	1.450	X 1.230	X 1.086
Evaluated Bid	\$1,450.00	\$1,291.50	\$1,113.15



<sup>1</sup> A lot normalization factor (Q factor) is used to eliminate any lot value bias (Not shown)

<sup>2</sup> For this company, suppliers with insufficient data for a valid SPI are weighted at the commodity group average.

**Figure IIB.4: Total Cost Assessment Ratio**

### Supplier Evaluation and Development

There are two primary purposes to supplier evaluation and development initiatives:

- Communicate supplier performance standards and requirements; and,
- Educate suppliers on the supplier improvement process.

The scope generally covers all suppliers, but especially critical suppliers. Companies typically communicate their guidelines and standards through published documents and formal supplier education programs. This is a highly proactive process in which companies view their suppliers “as their customers.”

### Supplier Approval

A robust supplier approval process incorporates multiple data sources, focuses on quality, is documented, and is shared with suppliers. Supplier information gathered during the evaluation may include general business standing, service levels, distribution/logistic capabilities, supplier specifications/product brochures, company networking, and existing like-product data.

An example of the scope and depth of supplier approval programs is presented in Figure IIB.5:

Supplier Approval Requirements	Raw Materials, Components & Services						Contract Finished Goods & Services					
	RISK LEVELS			DISTRIBUTED PRODUCT			PRIVATE LABEL			MANUFACTURED		
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Facility Assessment-- Process & Control Systems			✗					✗	✗	✗	✗	✗
Questionnaire (e.g., general business, regulatory, environmental, diversity)	✗	✗	✗				✗	✗	✗	✗	✗	✗
Regulatory Standing										✗	✗	✗
Supplier Change Approval Commitment			✗				✗	✗	✗	✗	✗	✗
Business Standing		✗	✗							✗	✗	✗
Service Levels, distribution/logistics capability/networking		✗	✗				✗	✗	✗	✗	✗	✗
Approved NDA (if applicable)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Labeling approved							✗	✗	✗	✗	✗	✗
Legal contracts: Pricing, volumes, indemnification, liability insurance, recall responsibilities, quality, distribution, design responsibility /regulatory ownership labeling					✗	✗	✗	✗	✗	✗	✗	✗

Note: Example from manufacturer/distributor operating under Current Good Manufacturing Practices (CGMP).

**Figure IIB.5: Supplier Approval Elements**

Approval is formally documented to cover approved locations; any required reports or data; a list of processes approved; additional relevant quality information; and sign-off by business area teams.

### Supplier Recognition Programs

Many commercial firms acknowledge supplier performance with a recognition program. Recognition programs vary, but an important outcome is the strengthening of customer-supplier relationships. Many companies present their best performing suppliers with an award, while others less formally send thank you letters. Most suppliers strive for such recognition--it brings publicity as well as more business from the customer giving the award.