

metric systems

Can measurements help your company improve distribution?

Grainger Industrial and Intuit Inc. report good results from two very different programs.

Today, many companies believe that establishing a measurement—or metric—program will help them improve their distribution operations. But developing a metric program requires a lot of work to determine what's really important to achieving company goals. Profiled below are the efforts of two leading companies—Grainger Industrial and Intuit Inc.—to set up programs to bring excellence to their logistics operations.

1. GRAINGER TAKES STOCK

When pilots fly an airplane, they rely on an array of gauges on the instrument panel to keep the flight on course. The same attention to measurements is required of managers responsible for keeping goods flowing smoothly through a supply chain. At least, that's the premise behind the system of metrics adopted by the nation's leading industrial distributor, the Grainger Industrial division of W.W. Grainger Inc.

Grainger credits the "balanced scorecard" approach—a measurement system that includes not only financial measures, but also internal process, employee, and customer measures—with helping it cut supply chain costs significantly, shave inventory, and boost its on-time shipping performance. "Our metrics have

helped us drive the performance of our supply chain," says Rick Adams, Grainger's vice president of logistics.

Grainger Charts New Course

Based in Lake Forest, Ill., W.W. Grainger Inc. provides maintenance, repair, and operating (MRO) supplies for businesses throughout North America, recording sales of \$4.98 billion in 2000. About five years ago, in hopes of bringing more focus and discipline to its business, the industrial supply company set about developing a metric program for key indicators—or what it calls "cockpit charts"—for the process improvement teams assigned to both marketing and supply chain operations.

The process improvement initiative team for supply chain management tracks performance via Excel spreadsheets against pre-established targets in nine key areas—or nine panels in the cockpit chart, as Grainger calls them. The metrics themselves cover nine areas that range from the operational to the financial.

The first metric covers inventory turns. In its annual plan, Grainger set a benchmark of somewhere above four turns per year for inventory. In the last year, Adams reports, the metric program has helped Grainger reduce overall inventory by \$100 mil-

lion dollars or about 14 percent.

Grainger's second metric measures customer-service levels. On a monthly basis, the company monitors service on individual product lines, at each distribution facility, and for each customer. The scoring is determined from the customer's perspective. For example, Adams notes, if a customer orders five lines of product and Grainger has four of those lines in stock, it would receive a score of 100 percent for the four product lines on hand and a zero for the one line that was out of stock. As for the order service rating, the company would get a zero because it couldn't ship the customer the complete list of requested products.

The third metric evaluates supplier performance on the basis of total cost of procurement. Adams says that his company has employed the activity-based costing method of financial analysis to segment out each expense associated with product procurement. It takes into account the cost of such types of non-conformance as invoice errors, receipt variances, and early and late shipments. For example, Adams says, "If we get incorrect paperwork from a supplier, [our financial analysis] gives us the costs we incur to identify and correct that."

The fourth metric appraises excess inventory. Adams reports that after a specified amount of time in storage, a product is considered to be excess and his company looks for ways to reduce

By James A. Cooke,
Senior Technology Editor

Metrics, *continued*

unnecessary inventory. "Inventory for us is a big asset," he notes, "and one of our key measures is return on invested capital."

Grainger's fifth metric centers on freight costs, both inbound and outbound. Grainger has outsourced management of its inbound shipments to the Internet freight exchange Transplace in order to consolidate incoming carriers and shipments. Grainger itself, however, still oversees its outbound shipments, the majority of which are sent by United Parcel Service (UPS). Adams notes that his company establishes a budget in this area each year and keeps a close watch on its freight expenses.

Distribution center productivity is the focus of Grainger's sixth measure. The company evaluates each facility in its network based on lines per hour. "We look at the number of lines shipped out the door vs. the person hours we have to put into it," explains Adams. "The higher the amount of lines you can put out for each hour, the better."

In fact, in an effort to boost throughput, Grainger has embarked on a \$165 million redesign of its logistics network. Targeted for completion by 2003, the new network is expected to improve throughput by 50

percent. Once the distribution network has been revamped, Grainger will have nine new facilities furnished with the latest in automated materials handling and radio-frequency equipment. "Theoretically," says Adams, "we'll be able to take an order in a branch and have it picked on the floor in a matter of minutes."

Grainger's seventh metric tracks the cost of goods sold. This metric covers both the cost of the product per se as well as the transportation expense incurred to bring it into a Grainger facility.

The eighth measure takes into account economic earnings. The company looks at the opportunity cost of invested capital; in other words, what kind of return a given investment has realized in comparison with investment in another venture. Adams notes that the company has set its own internal target rate for return on invested capital.

Grainger's ninth metric tracks its overall supply chain costs as a percentage of sales. Once again, the company sets targets and measures itself on whether it meets them.

Measurable Results

So far, the program is evidently accomplishing what it was intended to do. In the year 2000, the supplier says, it reduced its cost of supply chain

quality failures by 13 percent in comparison to 1999. On-time shipping performance in 2000 also improved 17 percent over the previous year's, resulting in a 32-percent reduction in costs associated with not shipping on time. "The metric program has allowed us tighter expense control and [helped us] focus more resources on fewer initiatives," says Adams.

Interestingly, Grainger has begun sharing the results of its monthly reviews with suppliers on its extranet. "Our suppliers are now getting these measures in real time," says Adams. "If we have an issue with a regional distribution center, we can have a supplier respond immediately."

Although the cockpit charts have helped Grainger boost its supply chain performance, Adams notes that the metric system is an evolving one. "You want your cockpit charts to give an accurate picture of your business. If you find you need a different piece, you bring it in. So the chart is open to being changed over time."

2. INTUIT'S BIG PICTURE

If you want to get the full picture of how your supply chain is operating outside the walls of your company, you'll need to enlist your suppliers' help. To get that kind of big-picture view, Intuit Inc., a Mountain View, Calif.-based software maker, turned to its key supplier, Modus Media International (MMI) of Westwood, Mass., for help designing both an internal and external metric program to evaluate its supply chain.

Intuit makes finance and tax software packages, including the Quicken and TurboTax programs, reporting net revenues of \$1.2 billion for fiscal year 2001. Although Intuit develops its own software programs, it hires suppliers such as Modus Media International to manufacture and distribute the products—software CDs, instruction manuals for using the products, and the

The Nine Gauges in Grainger's "Cockpit Chart"

- 1. Inventory turns.** Has the company met its pre-established target for annual stock turnover?
- 2. Customer service.** Has the company had orders by product line, customer, and facility in stock?
- 3. Total cost of procurement.** Has the company incurred unnecessary expenses because of supplier non-conformance with product specifications?
- 4. Excess inventory.** Has the company held stock beyond a specified amount of time without a customer order?
- 5. Freight costs.** Has the company stayed within its annual budget for inbound and outbound shipments?
- 6. Distribution center productivity.** How much hourly labor is needed to ship lines of product?
- 7. Cost of goods sold.** What does it cost to produce and deliver the product?
- 8. Economic earnings.** Has the invested capital generated an adequate return?
- 9. Supply chain costs as a percentage of sales.** Has the company kept supply chain costs within the limits previously set?

Metrics, continued

product packaging itself.

In June 1999, Intuit, which historically had sold its packages through distributors and retail outlets, embarked on a plan to re-engineer its supply chain to adjust to growing demands for more direct store deliveries as well as direct customer sales over the Internet. As part of the re-engineering initiative, it went from three suppliers to one: MMI.

Intuit's management concluded that successful re-engineering would require the adoption of some database tools to evaluate performance. "A lot of our understanding of how we were working with our customers was anecdotal, based on feelings and conversations," says David M. Foster, Intuit's director of supply chain management. "It wasn't based on data or performance metrics that the customers cared about."

Because MMI had previously set up its own internal metric program (see "Who should measure your performance?" *Logistics*, February 2001), Intuit turned to it for assistance in developing a measurement system for its entire supply chain. "MMI tackled the development of its own internal metrics in 1996, and by June of 1999, we were well down the road," says Kate Vitasek, MMI's vice president and general manager of global accounts. "We were in a position to work with a client to develop a joint supply chain scorecard, based on our experience and successes."

The two companies assembled a cross-functional team to develop both a process for examining the configuration of Intuit's supply chain and one for identifying key metrics. That team came up with a scorecard based on the SCOR Model (Supply Chain Operations Reference Model) developed by the Supply-Chain Council, an indus-

try group. The SCOR Model is a set of guidelines companies can use to evaluate their supply chains to determine the weak links and then work to achieve best practices. Initially, the team put together a scorecard containing 107 metrics, which stretched across procurement, materials management, manufacturing, order management, and fulfillment.

But as Intuit began using that scorecard, it found that the deployment of a hundred plus metrics didn't produce the sought-after holistic perspective. "We focused on the trivial many and not the critical few," explains Foster.

Since then, Intuit has honed its list of metrics down to 16, including three key performance indicators centering on total order cycle time, on-time and complete delivery of products to customers, and inventory management (see the accompanying sidebar). Foster says Intuit plans to begin working with retail customers to further define the areas of performance critical to them.

How Intuit Measures Modus Media's Performance

1. Frequency of quality issues. How many corrective actions were opened within the period being rated?

2. Timeliness of closure. How quickly does MMI respond to corrective action? Intuit's goal is five days.

3. Quality of response. Does the corrective action deal with the root cause and offer both a short-term and long-term solution?

4. Defective parts per million. What is the number of defects per million divided by the total number of samples taken?

5. Order and shipment accuracy. How many shipments have errors in them?

6. Cycle count accuracy. How accurate are the inventory counts of components?

7. Inventory accuracy. On the basis of random sample audit each month, does the degree of tolerance for A class items exceed 0.5 percent?

8. MRP audit accuracy. Is the material resource planning report accurate, i.e. did MMI buy the right products in the right quantities?

9. Timeliness of quotations. How quickly does MMI turn around a quote on new products?

10. Material cost reduction. What material cost reduction has been achieved against baseline costs?

11. Pricing audit accuracy. What's MMI's record on pricing? Ten bills of materials are audited quarterly to ensure that they are priced accurately.

12. On-time delivery to manufacturing plan. How good is MMI's manufacturing performance vs. the plan set by Intuit?

13. On-time delivery to customer order. How good is MMI's delivery performance vs. the plan set by Intuit?

14. Communications. Has MMI alerted Intuit to any upcoming issues?

15. Flexibility and problem resolution. How quickly does MMI respond to specific ad hoc requests from Intuit?

16. Quality and timeliness. How prompt and accurate are the standardized reports provided by MMI?

Scorecard-Driven Improvements

At the same time that it was refining its scorecard, Intuit began using its metric data in conjunction with a quarterly business review process and a performance-based contract it signed with MMI a year ago. Since the measurement system was put into place, Intuit has seen a 30-percent improvement in its fill rates from customer order to delivery. (The baseline did include the two other original suppliers besides MMI.) MMI has also delivered a 93.1 percent on-time rate for shipments and a 9.16 turn rate on assets. "In the last year, we have made good strides with MMI in helping us push service up and costs down," says Foster. "We have managed the supply chain and used data that help us focus on the things that are important to us and through an incentive package, drive the changes in the supply chain that help us be more cost competitive." D

