



the metrics: reloaded

The subject's still performance metrics, but our second annual survey looks at the topic in a whole new light ... and once again finds there's more than meets the eye.

SOME 5,000 YEARS AGO, IN THE LAND THAT IS NOW IRAQ, THE FIRST KNOWN SYSTEM OF writing was developed by the Sumerian people. Those early scribes scratching figures on clay tablets weren't recording epic tales, codifying laws or even chronicling the exploits of the gods. Scholars believe they had another, more mundane purpose in mind: to record inventory. It seems that the very first written words also represented the first known recording of supply chain measures.

Today, 50 centuries later, modern-day scribes—both humans and machines—still measure what's moving through the supply chain and how well the various players are carrying out their tasks. Though their tools may be digital, their goals haven't changed. Nor have the challenges. Today's warehouse and distribution managers still wrestle with such questions as what activities to measure, how to measure them, and what to do with the data they collect.

To learn more about how metrics are used in today's supply chain operations, *DC VELOCITY*, in partnership with Georgia Southern University, launched a study last year (see "taking appropriate measures," *DC VELOCITY*, July 2004). What that initial study found was that the respondents were indeed using detailed performance metrics but not necessarily to much effect. The metrics in use were rarely aligned with corporate strategy. Nor was there a terribly strong correlation between the metrics used and type of customer served. Indeed, the responses indicated that for most corporations, the process of choosing what to measure was a pretty scattershot affair.

The study further revealed that no standard "baseline" set of metrics existed that would allow DCs within, say, a specific industry to compare operations. Given that shortfall, the researchers decided their next step would be to try to develop the benchmark data needed for comparisons. To help them expand the study, the sponsors teamed up with two new partners: the Warehousing Education and Research Council (WERC), the leading association of warehousing professionals in North America, and Supply Chain Visions, a consulting firm that specializes in helping companies with supply chain strategy and education.

And so it was that this year's survey respondents were presented with an expanded list of questions. They were asked to identify the metrics they used; they were asked how well they were performing against those metrics; and they were asked how much management support they received. What follows is essentially an executive summary of the survey results. To view the full results, visit WERC's Web site (www.werc.org) or *DC VELOCITY*'s Web site (www.dcelocity.com).

So how're they doing?

In contrast to the first study, which looked strictly at what respondents were measuring and how they determined what to measure, the 2005 study broadened its focus. Respondents were presented with a list of 55 metrics and asked not only how important they considered each entry, but also how well they

felt their companies were performing in that area. What they're measuring will probably come as no surprise. As Exhibit 1 shows, the 11 most commonly used measures—such as on-time shipments and receipts, percentage of overtime hours, order fill rate and percentage of orders picked complete—tend to be operational (as opposed to, say, financial) in nature. All of these metrics were used by at least 80 percent of the respondents. At the other end of the scale were several metrics that were used by fewer than half of the respondents. As Exhibit 2 shows, the less-popular measures included days of raw materials on hand, average

cubic capacity used and pounds shipped per worker hour. At the same time it asked respondents what they measured, our survey queried them as to how well they were performing against the metrics they considered most important. And like the children of the mythical Lake Wobegon, it seems that they're all above average. A majority (65 percent) of the respondents answered that they believed their performance to be about or above average with respect to peers in their industry in areas related to perfect order delivery, fill rates and cycle times. If that seems statistically improbable, it's important to keep in mind that a couple of things may be at work here. Certainly, it's possible that these particular respondents—members of WERC and managers engaged enough to fill out a detailed Web survey—work for companies that do, indeed, record consistently above-average performance. And, of course, it's equally possible that these companies believe they're performing better than experience would bear out.

EXHIBIT 1

the popular ...
the 11 most widely used metrics

Measure Used	Usage*	Median performance	Best practice performance
On-time shipments	96%	98%	99-100%
% of overtime hours	92%	10%	0-4%
Inventory count accuracy (% by units)	91%	99%	100%
On-time receipts	90%	92%	98-100%
% orders shipped complete	87%	96%	99-100%
Order picking accuracy (% by order)	84%	99%	100%
Annual work force turnover	83%	10%	0-3%
% of orders shipped without errors	83%	99%	100%
Order fill rate	81%	96%	99-100%
Average warehouse capacity used (% used ÷ total capacity)	81%	85%	93-100%
On-time delivery	81%	Varies by definition	

NOTE: "BEST PRACTICE" COMPANIES REPRESENT THE TOP 20TH PERCENTILE OF RESPONSES. **USAGE* FIGURE DOESN'T INCLUDE RESPONDENTS WHO DIDN'T ANSWER THIS QUESTION.

EXHIBIT 2

... and the not-so-popular:
the 10 least commonly used metrics

Measure Used	Usage*
Indirect distribution cost as % of total cost	44%
Average cubic capacity used	42%
Days of raw materials on hand	39%
Equipment cost per unit/case/pound	39%
Revenue per full-time equivalent worker	38%
Cases/units shipped per equipment hour	37%
Days of raw materials on hand	36%
Pounds shipped per worker hour	32%
Avg value of backorders as % of sales	32%
Value added per employee	20%

**USAGE* FIGURE DOESN'T INCLUDE RESPONDENTS WHO DIDN'T ANSWER THIS QUESTION.

The "on time" trap

Indeed, it's not at all unusual for suppliers to be less than objective about their own performance. And it's certainly not unheard of for a company to boast about its stellar record *shipping* orders on time while its customers lament its repeated failure to *deliver* on time. How could that be? It's very simple. On-time shipment and on-time delivery are two entirely different matters. A lot can happen between the time an item leaves the dock and the time it's delivered.

So why did more of the survey respondents say they measured "on-time shipment" than "on-time delivery?" For one thing, it's a whole lot simpler. Tracking when an order ships is a straightforward matter; it's much tougher to obtain reliable data on precisely when the order was delivered. And because the survey's respondents were DC managers, it could be that this metric simply reflects their daily responsibilities more accurately.

But that's not the only difficulty. Another, more intractable, problem is the apparent confusion surrounding exactly what "on time" means. When asked whether their customers defined on-time delivery differently, nearly 70 percent of the respondents answered yes.

How much variation could there possibly be in the definition of "on time?" Apparently, quite a lot. Many respondents (58 percent) indicated that their customers simply defined an on-time delivery as a delivery on the requested or agreed-upon day. But others were more exacting. Thirty-two percent of the respondents said that "on time" meant delivery at an appointed time, or at least within a 30-minute window of that appointed time. Still others reported different definitions, including "No line down time" or "By 4:00 p.m." This lack of agreed-upon standards and definitions

goes a long way toward explaining why some suppliers have difficulty delivering “on time.”

Room for improvement

But even delivering shipments on time every time doesn't necessarily guarantee happy customers. Timeliness doesn't count for much if the customer opens the carton to find not the six dozen red sweaters it ordered but 16 pairs of jeans and two pink sweaters. Nor will timeliness matter much if the invoice is riddled with errors or the goods arrive damaged.

There is, however, one widely recommended measure that incorporates all of these elements—the Perfect Order Index (POI). If an order is to qualify as a “perfect order,” the following conditions must be met: 1) the right items are delivered to the right place, 2) at the right time, 3) in defect-free condition, and 4) with the correct documentation and pricing/invoicing.

Despite its obvious advantages, the POI is hardly in widespread use today; our survey indicated that only 42 percent of the respondents used the POI, and only about 32 percent considered it to be an important measure. But we believe that as more companies try to close the performance perception gaps with customers, they will start to see the value of the Perfect Order Index.

The survey team also noted that few companies were using what we consider to be a solid set of balanced measures. When the respondents ranked the 55 metrics according to importance, they tended to favor operational and “capacity and quality” metrics. Notably absent from the top of the list were measures that are primarily financial.

Ideally, we would like to see a more even distribution of the types of measures used. For the most part, our study confirmed our suspicions from last year that measures tended to be used as part of a “foxhole” management strategy—that is, each department focused on its own performance without much regard for the corporate big picture.

A little R-E-S-P-E-C-T

The final part of the survey contained questions about corporate attitudes toward metrics programs. One question, for example, focused on senior management's interest in performance measures—specifically, whether that interest had increased or decreased in 2004. Nearly two-thirds of the respondents (66 percent) indicated that their company's senior management had demonstrated increased interest in metrics, while only 3 percent reported decreased interest. This is an encouraging sign—one likely related to an increased awareness among top executives of the potential benefits of effective supply chain management.

It appears that the survey respondents haven't just captured management's attention; they've also captured its ear. More than 80 percent of the respondents said they felt that management listened to and acted on their suggestions for improvement. But that doesn't necessarily mean they're compensated for their wisdom. While 85 percent said they were recognized for making the company better, only 60

[a look at the survey respondents](#)

Conventional wisdom dictates that the longer you make a questionnaire, the fewer responses you'll get. And there's no disputing the second annual metrics study questionnaire was long—10 pages' worth of detailed questions. Nonetheless, more than 380 *DC VELOCITY* readers and WERC members took the time to respond.

Just who were these dedicated professionals? They came from companies of all sizes representing a wide range of industries. Nearly one-third—30 percent—of the respondents worked in the consumer products manufacturing industry. Another 22 percent came from the third-party warehousing industry, while 12 percent came from general manufacturing and 9 percent worked in the retail industry.

As for their “location” in the supply chain—that is, whether their direct customers were end users, retailers, distributors/wholesalers, or manufacturers—most were either at or very close to the end of the chain. Roughly 60 percent indicated that their customers were either retailers or the end users. Only 18 percent reported that their primary customers were distributors, and the remaining 22 percent sold to manufacturers.

As for company size, it turned out that the respondents' businesses were fairly equally distributed among the survey's size categories: about one-third worked for businesses reporting sales of less than \$100 million, about one-third reported that their companies' sales fell into the \$100 million to \$500 million range, and the remaining third reported sales in excess of \$500 million.

percent reported that they were financially rewarded for their improvement efforts.

On the subject of management communication to staff, the majority of respondents (75 percent) reported that they felt they fully understood the company's values and direction, that they were clear on their personal role within the company, and that they were comfortable that the company was headed in the right direction. That's important, because no measurement program will succeed if employees don't understand where the company is headed. Nonetheless, the researchers question whether the relatively infrequent use of financially oriented metrics may indicate that top management is being less than forthcoming about corporate financial objectives.

It remains to be seen whether questions like these will be resolved in next year's edition of the metrics study. In the meantime, the study's authors invite readers' comments, suggestions, and insights into the research and their own use of measures. They can be reached by e-mail: Karl B. Manrodt at Kmanrodt@georgiasouthern.edu; Kate L. Vitasek at kate@scvisions.com. □

Karl B. Manrodt is associate professor of logistics at Georgia Southern University. Kate Vitasek is managing partner of Supply Chain Visions.