Distribution Metrics: How Healthy Are You?

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Most people today know two numbers relating to their health: their blood pressure and their cholesterol level. These are two indicators out of the hundreds available to our doctors that give insight into the state of our internal systems. These metrics let us know if adjustments are needed to maintain a healthy, vital existence. Many distribution professionals are not so lucky - they do not have enough data points to fully diagnose issues and opportunities deep within their operations. A good metric program is an indispensable tool for logistical improvement. In this article, we will discuss what makes a good metric, how to get started, what to measure, and what to do with the data once you have collected it.

Objectives of Metrics
We will refer to a metric as a piece of data that represents some aspect of a process. This data is methodically collected and reported in a fashion that gives managers insight into their operations. Good metrics have several basic objectives, including:

· To measure business progress and performance
· To measure key activities within processes and subprocesses
· To improve business results

Why Are Metrics Needed?
Metrics are needed for a variety of reasons but perhaps the most important is reflected in this quote:

“That which is not measured is most assuredly in the tank.”

This highlights the need for tools that help us improve our distribution processes. On the highest level, a metric program must be put into place to improve the business and tie the distribution operation firmly to your corporate objectives.

Closer to the ground, a good metrics program provides many tools for improving day-to-day operations. This data is often the best means of identifying the areas in your operation requiring attention and should be the basis for directing your process improvement efforts and the main driver for directing your capital spending. Other important metrics-based activities include:

· Capacity planning
· Continuous improvement
· Redesign of your delivery system to support changes in your order and SKU profiles
· Providing the data necessary for detailed ROI analyses

Metric Characteristics
There are several characteristics that mark good metrics programs. They include:

· The data collected supports the businesses objectives – they measure the things that matter.
· The data is timely – hour-by-hour numbers can allow you to resolve an issue before it becomes a major problem.
· You must be able to act upon the data you collect – other data points may be interesting, but if they don’t allow you to make better decisions then they just add to the clutter.
· The individual metrics in your program will evolve over time – as different issues confront your operation, new processes will become important and should be measured.
· Your measurements should focus on individual or group performance.
· Training and communication are critical.

The last characteristic is the most important: the data should be communicated throughout the organization in an easily understood fashion. This is the only way to get the trust and participation required to measure and improve your operation.

Different Measures
There are three different levels of metrics needed to fully tie your operation to your company’s objectives. These are:

Level 1: Subprocess Metrics
This is the lowest level and centers around the performance of individuals or groups. Individual reporting provides an opportunity to address performance issues directly with individuals and to be able to recognize outstanding performance by specific employees. Measuring groups, also effective, reduces the amount of data collection required. Group standards are often just as effective as individual standards when used in the right setting. Subprocess metrics center on performance of specific people and functions in the DC. Typically, a operating department is composed of several functions, each of which need their own metrics. For example, the Stocking Department may have totals for the putaway function and for the replenishment function.

Level 2: Process Metrics
These metrics include the summaries of the subprocess metrics as well as the customer service metrics.

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Level 3: Overall Company Metrics
These are the highest level and are the numbers that tie the performance of the DC to that of the company.

Specific metrics for each of the levels will be identified later on in the article.

How to Get Started
At first glance, beginning a metrics program can be a daunting activity. In order for it to be as effective as possible, many items have to be captured and reported, targets of performance need to be identified, training completed, and the results communicated. This is an imposing amount of work in even a small distribution operation. The good news is that you can start small and develop your program over time. With that one-step-at-a-time approach in mind, here are suggestions for getting started:

1. Identify a person who will own the metrics program. There are many tasks to be completed, and assigning one person the task of heading up the effort is important. Traditionally, industrial engineers have served in this role, but this is not necessarily an engineering position. The program can be handled by anyone with the drive, analytical experience, and authority to make things happen.

2. Identify the items that you want to measure before becoming too concerned about where the data will come from. There are many places to get the data (WMS, ERP, Machine Control System, manual logs, etc.), and the first objective is to identify a balanced set of measures – leaving the method of collection to be determined later.

3. Start anywhere. After identifying what you want to measure, pick several that are important to the issues you are facing and begin there. Waiting until the entire program has been formalized will only delay improving your organization.

4. Have target performance objectives identified for each metric. These can be engineered standards, but if those are not available, historical averages and best guesses will give you a place to start.

5. Develop reports that are easy to read and understand. If people can’t interpret the data, they won’t support the program. Post the results in prominent locations.

6. Train the staff on how the metrics have been developed, what your objectives for the program are, what they should expect, and how they can use the data to improve their processes.

7. Make the metrics program visible and important. Again, communication is key. Make sure everyone understands the goals, methods, and results. Use the data routinely for making decisions such as budgeting, staffing, capacity projections, overtime estimates, etc.

8. Introduce new metrics regularly.

9. Try to balance productivity, quality, and customer service.

Most importantly, begin using the metrics program to improve your operation as quickly as possible.

What to Measure
We have discussed many of the characteristics of a good metric. Now we will explore some of the specific measurements useful in a distribution setting. Before we get into the specifics, one item to keep in mind is the unit of measure for the metric in each department and function. This will vary by area and function and should be selected to best match the process at hand. In picking, for example, many things can be reported, including total dollar value picked, total units picked, total inner packs picked, total cartons picked, and total pallets picked. You should use the unit of measure that matches the work; so, if you are predominately an inner pack operation, measure inner-packs and not units. This focuses on the productivity of your order fillers and filters out, for example, the spurious effect of changing inner-pack quantities. You may find it necessary to measure dollars shipped to report to the Sales Department, but make sure to also measure the numbers that more directly reflect your productivity.

Here are suggestions for what to measure on each of the three levels:

Subprocess Metrics
1. Orders picked per hour
2. Orders packed per hour
3. Lines picked per hour
4. Cartons received per hour
5. Cartons stocked per hour
6. Cartons replenished per hour
7. Cost per order
8. Dock-to-stock time
9. Cartons shipped per hour
10. Direct units per hour
11. Units shipped per total hour
12. Units shipped per direct hour
13. Units processed (received + shipped) per hour
14. Time spent picking back orders or stock outs

Process Level Metrics
A. Overall Distribution Center (DC) Metrics
1. Dollar value per line
2. Dollar value per order
3. Cost per unit shipped or processed
4. Transport cost per unit
5. Total DC lines per hour
6. Total DC units per hour
7. Total units processed per hour

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8. Units per total hours
9. Units per direct hours
10. Total hours worked
11. Total hours paid
12. Total allocatable inventory
13. Pick roll-over
14. Back orders

B. Warehouse Utilization Metrics
1. Storage utilization
2. Storage equipment utilization
3. Conveyor downtime
4. Line full conditions per hour
5. Cartons not diverted per hour
6. Scanner read rates
7. Start-Stop times
8. Equipment downtime

C. Asset Management Metrics
1. Inventory turns
2. Inventory carrying costs
3. Number of days on hand
4. Obsolete inventory
5. Return on net assets
6. Return on investment
7. Inventory fill ratio
8. Percent of inventory that is allocatable
9. Shrinkage as percent of throughput
10. Cycle count results

D. Quality Metrics
1. Picking errors
2. Receiving errors
3. Stocking errors
4. Replenishment errors
5. Shipping errors
6. Cycle count accuracy
7. ASN errors

Overall Company Metrics
1. Distribution cost as a percentage of sales
2. Total cost per unit shipped
3. Frequency of damage
4. Dollar amount of damage
5. Rate of customer returns
6. Cost of returned goods
7. Rate of accurate invoicing
8. Rate of damage-free receipt of product
9. Rate of on-time delivery
10. Rate of perfect order fulfillment
11. Fill rate
12. Rate of stock-outs
13. Rate of back orders
14. Rate of perfect order completion

Where to Go Next
After selecting the metrics that you would like to measure, you need to identify where the data will come from, and what to do with the results.

There are several methods for collecting production-related data. A good PC-based machine control system like fortnaplus™ will capture and record all task data that it controls. This can include picking data from zone routing, RF, or pick-to-light transactions. Shipping numbers can be collected from divert messages. Your WMS also can report any task that is system-generated and can give employee, start/stop, and number of pieces data. Modifications to the WMS may be required, so take time to think out your entire approach and to look for alternate collection methods before spending your money on potentially unnecessary modifications. And remember, in the old days, pencil and paper tracking worked fine. It is better to have to capture some critical piece of info that way than to ignore an important metric.

After collecting your data for a short period of time, you will be able to identify areas that need improvement. For those areas, improvement actions can include:

- Communicating and posting the metrics to encourage higher productivity.
- Evaluating the process and removing steps that don’t add value for the customer.
- Reviewing the order and SKU profiles to identify changes that have taken place in your business over time. fortnaDCmodeler™ is a great tool for this analysis. After identifying where the shift took place, improve your processes to better match the new reality.
- Tying the metric results to individual goals and performance appraisals.

Another important study predicated on metrics is a capacity study. With the rates and volumes you have calculated you can predict maximum capacity into the future based on your growth forecasts or historical trends. This will identify the areas that need improvement and will show how your capital budget should be directed.

Conclusion

“If you need a new process and don’t install it, you pay for it without getting it.” — Ken Stork

Metrics programs show you what is going on deep within your distribution operation. They identify opportunities for improvement, help prioritize and justify process and capital improvements, and provide crucial data for making day-to-day decisions. This is the best tool for ensuring that you have a healthy company and will continue to be successful as your business evolves.