Order Fulfillment Metrics

Get Started With the Top Three Metrics and Improve Your Order Fulfillment Performance

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Order fulfillment is the most crucial and labor-intensive process within the distribution center (DC). As a cost center, order fulfillment and replenishment typically accounts for 50-65 percent of warehouse labor expense. For this reason alone, continuous improvement of the order fulfillment process is critical. The ability to assess productivity and efficiency via order fulfillment metrics provides the shortest route to improved performance and better planning - in both manual and automated systems. And, as the most recent WERC “DC Measures 2011” study indicated, more companies are taking their DC operations back in-house, leading to a need for a more thorough understanding of performance as related to internal management of the fulfillment process.

In this brief white paper, we’ll discuss what in our experience comprises the top three order fulfillment metrics from a DC manager’s perspective, and provide guidelines for implementing measurement solutions within your distribution center or warehouse.

The Top Three Metrics, and What They Tell Us

Many metrics can be used to analyze and optimize your order fulfillment system from an internal operation perspective. These include: order fill rate; order accuracy; line accuracy; order cycle time; inventory days on hand; storage usage; on-time delivery; cost per order; productivity; and system utilization, among others.

In our experience, the three most important of these in terms of assessing a baseline and improving performance are order accuracy, production pick rate and order cycle times. Let’s start by defining what these terms mean.

- **Order accuracy**: This is the ratio of the number of error-free orders over the total orders shipped, including factoring in the number of shorts.
- **Production pick rate**: This is the ratio of the volume of picking over the hours worked. The calculation is complicated by the fact that the total hours paid are rarely the total hours worked, introducing the need to assess productive time versus paid time.
- **Order cycle times**: What we refer to when we look at the actual ship date versus the customer order date.
General Guidelines for Measurement

When it comes to measuring performance, even the most basic manual system and the most sophisticated automated system share common attributes. In every case, it is important to include at least six months of data for non-seasonal operations, and at least 12 months for operations with a seasonal component. An ongoing measurement program will assist with gaining a sense of any trends taking place in the order fulfillment operation. Most sophisticated automated material handling systems providers have detailed operational analysis questionnaires they can assist the DC management in completing. If you have a solutions partner, ask them if they could help you with this process.

**Manual Systems:** Start with the simple goal of “doing something” to measure. In terms of gathering data for the top three metrics, order accuracy, production pick rate and order cycle times, this can include total pieces picked/labor hours, total lines/labor hours and should also include total pick “on task” hours in order to obtain productivity time, versus paid productive time. This can lead to decisions like “we need 10 labor units, but we lose 20 percent in productivity, so we’ll need to hire 12.”

**Automated Systems:** With automated systems, you will have data minute by minute, by associate. Advanced software will tell you the number of pickers, current pick rates, performance vs. goals or averages, planned work and estimated time, and resources to complete work and other important information to help you evaluate your operation. While this data is collected in real time, your current system may not support real-time reporting so you may be reviewing data that is a day old. Start with accessible data, and watch for trends over the 12-month period.

What the Numbers Tell Us, and Steps You Can Take to Improve Order Fulfillment Performance

You’ve had time to collect and analyze your data, and even discover some trends in your operation. So what’s next? A good place to start is looking at possible constraints on system performance. These may include staffing levels, work flow and peak handling practices among others. Shifting resources and closer monitoring of stock levels may be all that is required in order to meet daily goals. Let’s work through each of our top metrics and look at simple things that can be done to improve the operation.
Improving Order Accuracy

If it looks like order accuracy is coming up short, there are a number of potential constraint areas that can be discovered simply by walking around the DC during an active shift. Stocking activity can have a huge impact on order accuracy. For example, stocking prior to picking or synchronizing receiving and slotting can go a long way towards reducing instances of unavailable product. High velocity products may also need more slots, and you should check that similar items are not slotted next to one another.

Picking motions themselves can also have a negative impact on accuracy. If personnel are routinely standing on a lower shelf to reach an item on an upper shelf, you are going to experience inaccuracies. Cartons overhanging a slot can slow or impede picking, and cause missed or incorrect picks. Heavy items that are difficult to lift or move can also prove to be a distraction that leads to inaccurate picking. These are all relatively easy things to change or correct, but can have a substantial impact on accuracy.

Improving Production Pick Rate

Production pick rate is another DC process that benefits greatly from simple observation of every shift. At the most basic level, you need to make sure your order fillers are filling orders. And while you are walking around, pay careful attention to the picking process, in particular to the “touches.” More than likely you will discover unnecessary activities that can be eliminated. As your measurements come in, be sure to compare accuracy rates with productivity rates. Speed at the expense of accuracy should not be tolerated. An assessment of accuracy may lead to improvements in accountability and quality checks.

Managers of the most efficient DCs all have a thorough understanding of their processes. This enables them to map their operation and know what to look for in terms of preparation readiness for every shift. This will include looking at orders, stock levels and staffing – and ensuring that the shift is prepared for success before it even starts.

Improving Order Cycle Times

From a DC manager’s perspective, order cycle time is directly related to what can be promised to a customer. While a customer may be more concerned with on-time shipments, order cycle time provides a more robust measurement to track continuous improvement of operational performance.

One tactic to improve pick rates and reduce order cycle time is to optimize slotting. Items commonly ordered together (tooth paste and tooth brushes, for example) should be slotted in locations based on these order associations (item affinity). This will reduce walking distance between picks and minimize total zones an order needs to visit during an order fulfillment cycle.

From a system perspective, you may want to consider intelligent order releases, with technology-enabled release options based on overall facility operations and goals. And, as was true for pick rate and accuracy, ensuring that replenishment is completed prior to order start will have a positive impact on improving order cycle times.
Summing It Up

Continuous improvement of order fulfillment performance is critical to any fulfillment operation. By discerning the most important metrics to measure and manage your order fulfillment operation, and applying some of the simple methods and techniques outlined above to improve your operation’s performance, you will be on the way to a better understanding of the daily operation of your system and how to plan for the future.

Remember:
- You can’t improve what you don’t measure
- Start with accuracy, productivity and cycle time
- Examine your current operations and investigate new techniques and technologies

Additional Resources

If you found this white paper interesting, you may be interested in other Intelligrated white papers.

- Operational Efficiency: How will you know when your facility is out of control?
- Order Fulfillment Optimization
- Sorting Out Your Sortation Options

http://www.intelligrated.com/information_center/white_papers

Both the MHIA (www.mhia.org) and the WERC (www.werc.org) websites contain additional valuable information.