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TOP 10 INVENTORY MANAGEMENT KPIs

Key Performance Indicators for Maximizing Profit and Efficiency in Your Warehouse Operations

Key Performance Indicators that are Critical to Maximizing Profit and Efficiency in Your Warehouse Operations

A warehouse that doesn't perform doesn't stay in business. Most warehouse operators; however, struggle to successfully maintain and improve performance, particularly as operations become more complex. In fact, so many issues and factors interweave in the successful operation of even a single facility that untangling the knots can become a real challenge. Many warehouses don't even try.

Of those that do, many only monitor the most basic operations. According to Tim Judge, CEO of Agillitics, a supply chain consulting firm, the typical warehouse uses only about 40% of the available functionality of their Warehouse Management System (WMS), the primary tool for managing warehouse performance.

"Customers can be reluctant to embrace advanced functionality, which they may see as unproven or overly complex," said Judge.

That reluctance deprives the business of the good information needed to make high-ROI decisions about operations. How can the finance department justify the value of a new investment if the warehouse can't stay on top of the appropriate metrics? How can operations be made more efficient and faster so they can deliver?

This paper tackles analysis paralysis by connecting the dots between common warehouse issues, the key performance indicators (KPIs) that measure how well you're handling them, and the benefits that come from improving performance.

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Tim Judge, CEO of Agillitics

A warehouse is all about relationships, and the causes and effects that drive them. For example, a delay in inventory management upstream leads to an unhappy customer downstream whose request has been put on back-order. That's where KPIs come in. They enable the warehouse to stay on top of issues and even predictively and proactively manage the future through sales forecasts and inventory balancing. They provide the valuable information needed to move faster, ship sooner, please customers, and protect workers.

Yet out of hundreds of possible KPIs, which ones are the most important? Which have problems with the most ripple effects? What KPIs benefits pump up the bottom-line the most? Most importantly, how do you monitor them?

In this paper, we'll identify the top 10 warehouse KPIs. By the time we're finished, you should have a little more insight into how these KPIs relate to your own operations and, better yet, how to improve them.

Accuracy Indicators

Inventory Accuracy: **What's in stock?**

How accurately can you quickly determine what's in physical inventory without stopping warehouse activity? This question is foundational; it addresses not just efficiency but also solvency.

Consider this example: Acme's customer service starts fielding complaints about unfilled orders; order fill rate, it turns out, has plummeted to 75%. The result is support phone lines are clogged, and customers are seething. So customer service, in turn, alerts the warehouse manager, who dives into stock cards, inventory reports, picking lists, and other indicators of what they have in stock. He discovers major discrepancies between book and physical inventories. No wonder one order out of every four is going unfilled or incorrectly filled! Worse, the repercussions ripple outward by further generating incorrect demand forecasts, stock-outs and/or overstocking, and rising back order rates.

This KPI is truly key. Implement a regular procedure in which you count a limited, but representative, amount of stock based on date or location. Your WMS should be able to automatically perform this count on a daily, or any other scheduled, basis and then produce reports for review. In fact, as a result of regularly verifying inventory accuracy, not only will warehouse and logistics managers know what product is in the warehouse at any given time, they'll also know where it's located and when it needs to be re-ordered.

Warehouses that do not use a WMS for this functionality compromise their own effectiveness. According to "The Extended Warehouse Benchmark Report" from the Aberdeen Group, improving technology implementations has an enormous impact on inventory accuracy, increasing it by 68%. In fact, their survey shows this to be the top benefit.

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Source: "The Extended Warehouse Benchmark Report", The Aberdeen Group

Just as poor inventory accuracy is linked to downstream problems, good accuracy improves inventory turnover and provides better data for financial planning.

Order Filling Accuracy: **Are you shipping the right items?**

How accurately do you pull the correct items, in the correct quantities, to place into the appropriate shipping container? While inventory accuracy is foundational and precedes this one, order filling accuracy is nevertheless a keystone of any successful operation. If you can't get your orders right, customers won't hesitate to go somewhere else.

This KPI can be more subtle than you might realize, with even marginal rates potentially producing outlandish costs. Say your company has 2 million lines per year (1,600 orders times five lines per day) with an estimated 99% accuracy rate. That's an extraordinary accuracy rate, isn't it? Wait a minute. A 1% error rate means 20,000 line errors per year. If it costs $50 to fix a single error, a 1% error rate is going to cost $1 million annually.

Again, you might argue that's just the cost of doing business (maybe not good business), so let's take this a step further. If the company does $250 million in sales with a net profit of 3%, their bottom line is $7.5 million in profit. One million dollars is over 13% of profit; earning that $1 million in lost profit would require more than $30 million in additional sales.

99% is too low; aim for 99.9%.

That's why 99% is actually sub-par performance for most warehouses; instead, we recommend looking for 99.5% to 99.9% (best-in-class). Increasing order accuracy by just half a percentage point reduces errors by the thousands each year and the cost of errors by half a million. In other words, an additional half-point of accuracy directly increases profit by more than 6%.

Order filling accuracy depends on more than just inventory accuracy. It's almost identical to picking accuracy, which is the costliest and most labor intensive function in warehousing – and also one prone to human error and vulnerable to upstream errors such as wrong stock positioning. The more you can automate these operations, the easier it will be to generate high accuracy rates. In fact, according to Aberdeen Group, technology implementations decrease order pick times by half (51%) and increase order fulfillment accuracy by 67%.

You're not managing inventory; you're executing purchase orders.

Similarly, this is why analysts at technology research and advisory company, Gartner, believe the WMS should be understood and used in a more action-oriented way than they typically are. "We shouldn't call it a warehouse 'management' system," said Dwight Klappich, vice president of research at Gartner. "We should call it a warehouse 'execution' system, because that is basically what companies are using it for: the execution of specific warehousing tasks."

The alternative is relying on manual, labor-intensive systems that are prone to error and can result in poor production location, slotting and labeling. Too many touch points create vulnerabilities. Instead, track this KPI via your WMS to streamline, create a more efficient operation, and guarantee customer service improvements and cost effectiveness.

As a failsafe, it's wise to review items before they are loaded for transport and comparing against the appropriate invoice, requisition form, order form or packing list.

Indicators of Timeliness

On-Time Ready to Ship AND On-Time Shipment:
Are orders on time?

On-time ready to ship means that orders (including packaging and preparation of any shipping documents) are completed and ready for pickup on time. It's a necessary precursor to on-time shipment, which itself precedes on-time delivery, and timely delivery is the key to a happy customer. Maintaining these two metrics is at the heart of keeping the supply chain running smoothly.

Whether you should to focus on on-time shipment or on-time delivery as your key metric depends on your specific business. For example, if you're shipping orders to end-users, you might focus on on-time shipments (which may fall more completely under your own control), trusting that on-time shipments will generate the maximum rate of on-time delivery. However, if you're shipping to a reseller, it may be on-time delivery that is absolutely paramount; otherwise, you risk interrupting the supply chain mid-stream. You can always track both, of course.

As Manufacturing Business Technology Magazine put it: delayed shipments and the lack of data "creates a black hole for the customer until the product is delivered."

Either way, use technology to your benefit.

"Today's WMS can be set up so that it notifies the warehouse manager and shows him a dashboard that says here are all your orders," said Klappich.

He notes that WMS providers have even created apps for mobile equipment—tablets, smartphones, handheld computers—so that a manager can be automatically alerted via any device when 20 orders are potentially going to be late. Use of a WMS correlates to higher customer satisfaction and gross margin return of inventory investment.

Just make sure the WMS implementation matches your business needs; otherwise, performance can slip. One company was able to improve on-time delivery from 77% to 94% once they started using a WMS that could track all of their multiple warehouse facilities.

Order Cycle Time: **How long does it take to assemble orders?**

Closely related to the previous two KPIs is a behind-the-scenes metric: order cycle time. Specifically, this KPI tracks how much time is spent between the time an order is placed and the moment it ships. We're grouping it with timeliness indicators, but really it's a pure indicator of the "pick-pack-ship" efficiency of a warehouse.

The objective: minimize order cycle time. As a benchmark, consider best-in-class performance to be less than three hours, with median (middle of the road) performance at 13 hours.

You can look at order cycle time internally or comprehensively. Internal order cycle time is what we described above, time from order placement to shipment. Total order cycle time increases the scope of the metric from order placement to customer receipt. As with on-time shipment versus on-time delivery, which you track really just depends on your business. Does your business success depend more on getting it out the door on time or making sure it reaches your customer on time?

Let's look at a simple, internal example. Your organization receives three orders at 8 a.m. One gets out by 10 a.m. (two hours), one by 11 a.m. (three hours), and one by noon (four hours). The total number of hours is nine, into which we divide the number of orders for an average internal order cycle time of three hours, right on the cusp of best-in-class.

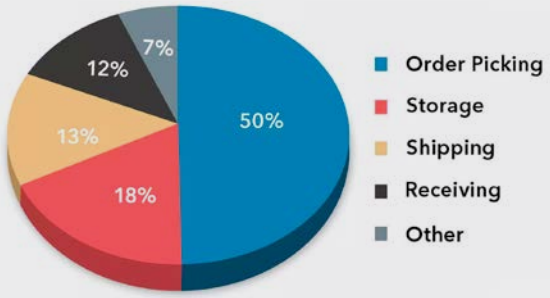
Improving Cycle Time Pays Dividends

One of the best ways to improve this metric is better slotting, which, in turn, can be made much easier by using WMS software to handle the process automatically.

Increasing order picking accuracy and inventory accuracy, while reducing order picking time, will also help. That last one – order picking time – is particularly notable. Improving that metric will have several rippling benefits.

Consider the pie chart. Fifty percent of a typical warehouse's operating cost comes down to order picking, and of that, more than half of an order picker's time is devoted just to traveling from spot to spot. Reducing travel time instantly reduces both order cycle time and operating costs. If you use your WMS for no other purpose than improving slotting and helping manage labor to reduce cycle time, it will still pay for itself in monitoring these KPIs.

Distribution of Warehouse Operating Costs



Dock-To-Stock Cycle Time Is Helpful Too

As a supplement to order cycle time, you might also consider looking at dock-to-stock cycle time, which measures the time of item receipt to the time the item is correctly stocked. Because dock-to-stock cycle time comes before order cycle, order cycle is entirely dependent on the dock-to-stock being executed well. Best-in-class for dock-to-stock is under two hours, with a median of six hours. Specifically, a survey from the Warehousing Education and Research Council revealed the top 20% of warehouses have a dock-to-stock less than two hours and 20 minutes; the lowest performing 20% exceed 24 hours!

Other Key Indicators

Fill Rate-Line:

How closely do on-time shipments adhere to actual orders?

Definition: The amount of order lines shipped on the initial shipment versus the amount of lines ordered.

Calculation: Divide the number of order lines filled to customer request by total number of order lines filled.

Fill rate metrics can be evaluated to determine proper inventory balancing, order schedules, and sales forecasting. Manufacturing Business Technology Magazine writes, "Generally, a higher fill rate signifies a better ability to meet sales requests, keeping customer satisfaction high."

This metric is actually fairly straight-forward. Let's say Acme orders 10 products, one order line each. If you ship seven line items on time, and the remaining three items after a delay, the fill rate for this purchase is 70%. Unfortunately, that is poor performance.

"Generally, a higher fill rate signifies a better ability to meet sales requests, keeping customer satisfaction high."

Manufacturing Business Technology Magazine

Best-in-class is less than 99.8%, and median is 98.3%. However, if you're struggling here, a good WMS makes all the difference. One company jumped from 83% to 99% by instituting a WMS that could handle multiple facilities.

Dead Stock / Write-Offs: How much stock is a loss?

Definition: Stock that has stopped moving and is just sitting in your warehouse. May require write-offs.

Calculation: Monitor the value of the stock and write-offs.

Slow inventory turnover has another implication – the longer a company holds onto inventory, the more likely it will be damaged or become outdated. If inventory turnover is slowing, watch out for dying stock.

Such stock may be damaged and unsalvageable, expired, or simply obsolete. Move dead stock as quickly as possible. You can set up automatic alerts in many WMS to proactively identify slow-moving stock before you inadvertently order more.

Employee Metrics: **How productive is your workforce?**

Improved utilization of resources is central to boosting performance; in fact, it's the key driver for 31% of warehouses for adopting a good WMS. Even more warehouses (45%) use their WMS to increase sales without increased staffing or space.

Improving worker productivity is the way to do that. Given that the workforce represents 45-50% of the operational costs of a warehouse, reducing labor costs per unit handled instantly improves cost efficiency and profitability. This is where the WMS comes in: it can help determine who should shoulder which tasks in order to optimize labor and task efficiency. That step could increase worker productivity by as much as 20%.

For example, instead of having a truck drive away empty after delivering its payload, the WMS can interweave tasks and instruct the driver to pick up a replenishment pallet located at or near the drop-off point. A WMS can also improve employees' ability to manage their own activities, requiring less direct oversight or manual intervention from managers.

Inventory Turnover: **How quickly do you go through inventory?**

Definition: Ratio of a warehouse's annual (or other time period) shipment to its inventory, measured in dollars, for a given product or for inventory as a whole. It's the number of times that inventory cycles or turns per year (or other time period).

Calculation: Divide the total value of items distributed or sold by average value of inventory.

Slow inventory turnover has another implication – the longer a company holds onto inventory, the more likely it will be damaged or become outdated. If inventory turnover is slowing, watch out for dying stock.

If a warehouse moves $100,000 worth of inventory in one year and carries, on average, $10,000 of inventory at any given time during that year, the inventory has turned over 10 times during the year. That's pretty good. Generally, you're looking for turnover rates between six and 12, although the shelf life of your goods makes a big difference. Good inventory turnover indicates a healthy, efficient supply chain. It means you don't need as much storage space or equipment, which lowers the average holding cost and worker travel times, and increases profits.

Back-Order Rate: **How often do you lack the stock you need?**

Definition: The orders for which the supplier did not have enough stock on hand and had to back-order products on order.

Calculation: Divide the number of orders with products out of stock or on back-order by the total number of orders placed.

The reverse of dead stock is no better – stock that's not there when you need it. Closely related to inventory accuracy, and a similarly key customer service metric, a high back-order rate means you're habitually understocking, providing subpar service,

or losing business to competitors when customer orders go unfulfilled or are delayed. Lowering the back-order rate can lead to happier customers and a stronger market position. Look at stock management or problems originating upstream in the supply chain, and note that seasonality and shortages can also apply. If measuring back-orders as a percentage of total orders, aim for under 0.20%.

Too many warehouse operations fall behind in the marketplace because they don't make good enough use of these KPIs.

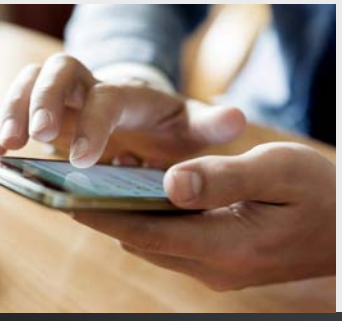
"WMS users struggle with using this data to drive work planning and staffing decisions, monitoring performance of operations at the supervisor and manager level, and understanding when there is a critical issue that needs their immediate attention," said Chris Jackson, president of Savant Software, a leading firm in supply chain optimization software.

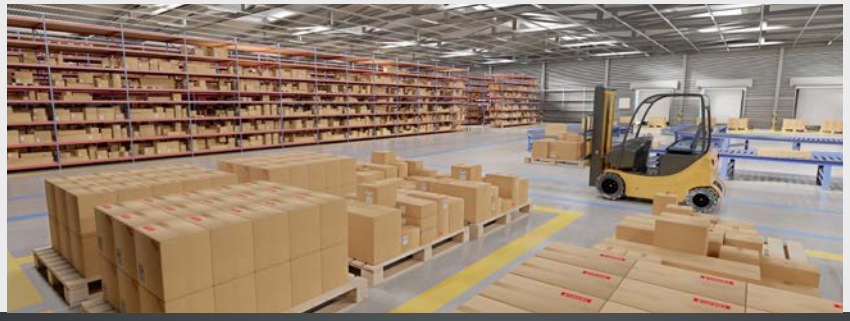
Jackson says the way most operations use their WMS solutions force them to be reactive to issues after they occur, rather than prevent them before they become impactful. By simply reading this white paper, you've already taken the first two steps toward that proactive stance that provides better business insight. First, you've learned about the most impactful KPIs that allow warehouse operators to connect the dots between problems they may be facing and the benefits that can be accrued by solving them. Second, you've seen the value of the KPIs, including the intent behind tracking them and the relationships that exist between them. From here, it's easier than you think. You can put those KPIs to use in three steps:

1. Identify areas of weakness and set goals. With the benchmarking stats and ideas from this paper, you can figure out where your operations need to improve. By focusing a small set of key metrics, you can avoid analysis paralysis and get moving.

2. Implement corrective actions. Once you know your new goals, take action. Configure your WMS to alert you automatically when the action is needed, such as when the KPI rises above or falls below certain thresholds.

3. Monitor results and tweak as appropriate. Business never stands still, and nowhere is that truer than in a warehouse with a constant flow of goods moving in and out. Today, it's a late supplier or too many people out sick. Tomorrow, it's a shortage in products or skilled personnel. By continuously monitoring these KPIs, your company can readily have all the information it needs to respond to changing needs instantly and into the future.





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