Warehouse Management System KPI Reference Guide

We all know that if you don't measure it, it won't improve, right? Unfortunately, it's not that simple. What *exactly* needs to be measured?

The top-level KPIs, or *Key Performance Indicators,* for your company, department, and even per employee are listed in this whitepaper.

Tracking KPIs will ensure that each department or individual knows exactly what his or her main job goals are and how they will be measured.

***Disclaimer:** Be careful, KPIs will drive behaviors and they must be designed to elicit desirable behaviors; if you are not careful, KPIs may produce undesirable behaviors. The **top three to five metrics** for a particular warehouse will be determined by many factors, including industry, type of goods, order frequency, average order size in units, space, number of employees, and more.

Below is a list of many of the top distribution center metrics we see that are being used, effectively:

On Time Shipments

# of Orders on Time / Total # of Orders Shipped = On Time Shipments

Tracking the percentage of orders that ship on time is very important, especially if the orders are eCommerce sales. You may end up with different one time numbers for orders associated with different sales channels or shipping methods.

Average Units per Transaction (items per order)

Total # of Units Sold / Total Transactions = Avg. Units per Transaction

This is the average number of items on an order, which is very important for purchasing and sales (depending on some factors) as the aim is to increase this value with upsells. This average is also vital to the warehouse in that it plays an essential role in determining pick/pack/ship workflows. It is useful to break this down by item classification if you are using zones in your warehouses.

Out of Stocks (fill rate)

# of Complete Orders Filled / Total Orders Shipped = Order Fill Rate

Out of stocks occur when an order is placed and then cannot be fulfilled. This is usually due to incorrect inventory although it can also be caused by oversells if there are issues with your cart or systems. To combat this, track how many out of stock cases occur over a set period of time and then compare that to overall orders and units shipped within that same time period. Fill rate, another option for this kpi, is essentially the inverse of this, which is the fraction of the order that can be met with available inventory.

Stockouts

Dollar Sales Lost (not backordered) / Total Dollar Sales = Total % of SKUs Stocked Out

A stockout is when there is no sale in the first place when there should have been a sale since the item was stocked and available. For example, if a company sells 300 units of item *x* per day and then for three days the SKU for that item becomes unavailable for sale, the company loses 900 sales due to a stockout. The determining factor for whether or not the stockout can be prevented is if the item is still available for purchase from the vendor(s).

Average Pick Time (picks per hour)

Total Picks / Total Time Picking = Avg. Pick Time

Labor cost/time per item or order shipped. This is a main KPI for most warehouses and offers information about the efficiency of your pick workflow methods as well as your pickers. Picks per hour should be calculated both per picker and for the team as a whole. **To calculate average pick time per picker,** take the total picks in the time period over which you're reporting and divide that by the total time the picker was picking. This calculation produces that specific picker's average pick per hour, which can help identify pickers who might need additional training, as well as give detailed data that can help to set good benchmarks

Turn Rate

Cost of Goods Sold / Average Inventory = Inventory Turnover

This is the number of times you turn your inventory per year. If a company claims that they turn their inventory six times per year that means that the total inventory amount was sold over that twelve month period. Turn rate can be calculated overall or for a segment of your inventory,

such as by classification. There is no one standard “good turn rate” for a company as this value varies by industry.

Weeks on Hand

52 Weeks / # of Inventory Turns = # of Weeks of Inventory on Hand

This is a simple metric that takes the average sales volume and returns how many weeks on hand of stock a company has at any given time. Depending on industry, there are different benchmarks for what is considered acceptable. A company can also break this metric down further into segments or classifications to get a more detailed view.

Average Order Cycle Time (time from transaction to shipping)

(Time Order Received by Customer - Time Order Placed) / Total # of Orders Shipped = Avg. Order Cycle Time

This metric provides a feel for your overall order processing speed, which is similar to first response rate for a customer service team. Average order cycle time represents the amount of time in which a warehouse crew can pick and ship an order, accurately.

Mis-Ship Rate (% of orders shipped complete)

# of Orders Shipped Complete / Total # of Orders Shipped = Order Shipping Accuracy

A mis-ship is a shipment that was shipped out with incorrect items. This is a metric that is calculated after the errors have occurred.

Mis-Picks (order picking accuracy)

# of Orders Picked Correctly / Total # of Orders Picked = Order Picking Accuracy

Mis-picks are similar to mis-ships except that for these, the error is identified before the order ships out. At shipping/quality control the order is checked and an item is identified as incorrect for the order. This error is marked in the system and the order must go back in the queue for correct picking of any missing items and for putaway of any incorrect items. The system can then give data on how many orders and units were mis-picks out of total orders in a time period.

Inventory Accuracy (Cycle Count Accuracy)

Database Inventory Count / Physical Inventory Count = Inventory Accuracy

We recommend doing continuous cycle counts; split them up into a few locations per week or per day with a goal of doing a full cycle count in *x* amount of time. The amount of time, *x,* will increase or decrease depending on accuracy. Calculate accuracy by taking your starting inventory and comparing it to a fresh count, recording the percentage off from the actual inventory. You can also identify locations or zones that are consistently less accurate and increase the cycle count frequency in those zones. This metric is a great KPI for the warehouse team as a whole because it is directly related to how well processes are being followed in other warehouse workflows.

Units in Receiving Queue & Average Time to Receive

Also known as dock to stock time, this metric is especially important if you run off terms. If you are on net-30 terms, your goal is to turn inventory in less than thirty days (and, in general, always as fast as possible). This way you profit more with less resources spent. The premise here is to track the time it takes your receiving team to stock and prep goods for the next step in their lifecycle. In addition, tracking how many items are in queue (waiting to be processed) can help dictate how many receivers are needed at a given time as well as their progress.

Dock to Stock Time (average time to receive)

Sum of Cycle Time (hrs) for all supplier receipts / Total # of Supplier Receipts = Dock to Stock Time

This is the average time it takes for new units delivered to make their way into stocked locations. This metric along with the units in receiving queue and receiving accuracy are three major metrics to help monitor receiving operations.

Carrying Cost

Inventory Carrying Rate x Average Inventory Value = Carrying Cost

This metric measures how much it costs to store a unit over a period of time. Carrying cost covers, labor, insurance and storage. The formula for this metric includes a safety stock percentage. (For example, 0.9 would indicate that you want to have a 90% chance that you will never run out of that SKU. This also means that you will have much higher carrying costs compared to someone running 0.1 or 10% certainty levels that they will not run out.) The amount of the carrying cost depends on how much safety stock you want to carry. Industry, product type, and customer expectations will play a large role in your strategy here. Reducing

inefficient processes can lower your carrying costs. If you have a high turn rate this may be a less important metric for your company.

Rate of Return

Number of Units Returned / Number of Units Sold = Rate of Return

This is a popular metric, which measures the percent of orders or items that are returned. You can get even more granular and assign returns to return reasons or codes and classify them as due to product or warehouse. This is a metric that cannot be run real time and must be backdated as the returns happen.