The 28 Warehouse Metrics
You Need to Monitor

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Inventory KPIs

1. Carrying Cost of Inventory
Every warehouse manager knows that stagnant inventory costs money. Quantifying these specific carrying costs — including capital costs, inventory risk, inventory service costs and obsolescence — enables warehouse managers to make smarter buying and forecasting decisions, which leads to higher inventory turnover.

$$Inventory\ Carrying\ Rate\ \times\ Average\ Inventory\ Value\ =\ Carrying\ Cost\ of\ Inventory$$

2. Inventory Turnover
Speaking of inventory turnover: You already know that the higher the rate of turnover, the better; but calculating your specific turnover rate helps you gauge your buying practice and product demand. Your warehouse management system (WMS) is designed to provide visibility and enable forecasting to keep goods moving.

The inventory turnover KPI quantifies how many times per year your distribution is able to go through its entire inventory. Compare this rate against industry averages to get a clear picture of your distribution center performance.

$$\frac{Cost\ of\ Goods\ Sold}{Average\ Inventory}\ =\ Inventory\ Turnover$$

3. Inventory-to-Sales Ratio
The inventory-to-sales ratio is affected by economic conditions and a company's ability to weather unanticipated disruption. This ratio helps warehouse managers identify early cash flow problems by holding increasing inventory levels up against declining sales rates. It can also prevent back orders by highlighting an influx in sales and the potential for an increase in buying in order to satisfy a spike in demand.

The inventory-to-sales ratio of a successful warehouse distribution center will reflect a streamlined order fulfillment process. Warehouse managers should carefully monitor this KPI and leverage it as a tool for forecasting and predicting future inventory needs.

$$\frac{End\ of\ Month\ Inventory\ Balance}{Sales\ for\ Same\ Month}\ =\ Inventory\ to\ Sales\ Ratio$$

4. Inventory Accuracy
The accuracy of your physical inventory should correspond with that listed in your data but, realistically, there's often a disparity between the two in any large distribution center. A high rate of inventory inaccuracy can result in unexpected back orders, dissatisfied customers and, ultimately, higher overall costs. Visibility is key to a high-performing warehouse. You can

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improve your inventory accuracy rate by conducting regular checks against your database, using **cycle counting** as a means of continually validating your database records.

$$\frac{Database\ Inventory\ Count}{Physical\ Inventory\ Count} = Inventory\ Accuracy$$

5. Inventory Shrinkage

Inventory shrinkage is a KPI used to monitor the loss of inventory due to theft, damage, clerical error, lost items, obsolescence or supplier fraud. Shrinkage is calculated by comparing recorded inventory against actual physical inventory to pinpoint any discrepancies.

A high rate of shrinkage can have a negative impact on company profits, so it's important that warehouse managers thoroughly investigate every case of shrinkage to get to the root of the problem.

$$\frac{(Cost\ of\ Recorded\ Inventory - Cost\ of\ Physical\ Inventory)}{Cost\ of\ Recorded\ Inventory} = Inventory\ Shrinkage$$

6. Order Lead Time

Order lead time, more commonly known as just lead time, refers to the length of time it takes for a customer to receive an order once it's been placed. Order lead time not only has a direct effect on customer satisfaction — the shorter the lead time, the happier the customer — it also affects the amount of inventory a warehouse needs to carry at any point in time. Long lead time contributes to customer dissatisfaction and can force a company to rely heavily on demand forecasting to make orders, so it's important that you monitor this KPI closely.

$$Supply\ Delay + Order\ Delay = Order\ Lead\ Time$$

Picking KPIs

7. Perfect Order Rate

This KPI measures how many orders your warehouse delivers without incident. In order to meet this standard, the correct item must have shipped on time and been received in good condition by the customer who ordered it. Lean practices are designed to help catch errors or inaccuracies before orders leave the warehouse.

You can improve your perfect order rate by strictly adhering to warehouse and distribution center best practices. By identifying problems as they arise and rooting them out at the source, you can catch imperfect orders before they ship to the customer.

$$\frac{Orders\ Completed\ without\ Incident}{Total\ Orders\ Placed} = Perfect\ Order\ Rate$$

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8. Order Picking Accuracy

In addition to tracking shipment and delivery status, you should also measure order picking accuracy. An inaccurate order can result in inventory being returned to shelves, increased shipping time per average order, a higher rate of return and so on. This is also considered to be an eCommerce KPI.

Lean distribution practices eliminate waste and streamline order-picking processes to help maintain a higher order accuracy rate.

$$\frac{Total\ Number\ of\ Orders}{Perfect\ Order\ Rate} = Order\ Picking\ Accuracy$$

9. Units per Transaction

Units per transaction (UPT) is a common metric for many businesses. Depending on your industry, you may or may not be realistically expect your UPT to increase. Compare your warehouse distribution center UPT with historical averages and trends within your industry for the most useful analysis. In some industries, such as retail and CPG, you can increase UPT through sales training and checkout experience improvements that encourage upselling.

$$\frac{Number\ of\ Units\ Sold}{Number\ of\ Transactions} = Units\ per\ Transaction$$

10. Back Order Rate

Your warehouse's back order rate is a telling indicator of whether you're successful at forecasting purchases and inventory supplies. A sudden spike in demand will understandably result in a temporarily high back order rate for any given item, but a consistently high or increasing back order rate is a sure sign of poor planning and lack of responsiveness.

You can decrease your back order rate by accurately forecasting and vigilantly monitoring your warehouse's inventory-to-sales ratio. A high inventory accuracy rate will also improve this KPI.

$$\frac{Orders\ Unfulfilled\ at\ Time\ of\ Purchase}{Total\ Orders\ Placed} = Back\ Order\ Rate$$

Distribution KPIs

11. Rate of Return

Rate of return is an incredibly useful KPI in a distribution center, especially when segmented by cause for return. Identifying causes for return — such as damage, late delivery, inaccurate product description or wrong item shipped — makes it easier for warehouse managers to address underlying issues and make the necessary improvements.

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$$\frac{Number\ of\ Units\ Returned}{Number\ of\ Units\ Sold} = Rate\ of\ Return$$

12. Cost per Line

In receiving, the cost per line KPI is used to measure the cost to receive a line item on a purchase order. Generally speaking, the higher the cost per line, the less efficient a warehouse's receiving process. Cost per line enables warehouse managers to better understand the costs associated with receiving and implement process improvements for better inventory management.

$$\frac{Total\ Cost\ of\ Receiving}{Total\ Line\ Items} = Cost\ per\ Line$$

Receiving KPIs

13. Receiving Efficiency

Receiving efficiency is a metric used to evaluate warehouse workplace productivity when receiving stock. Inefficiencies in your receiving area can have a ripple effect across warehouse operations, so it's vital to detect and eliminate inefficiencies as soon as possible in order to streamline the rest of your workflow.

$$\frac{Volume}{Number\ of\ Man\ Hours} = Receiving\ Efficiency$$

14. Receiving Cycle Time

The receiving cycle time reflects the total amount of time it takes to process a delivery. A short receiving cycle time is a clear indicator of an efficient delivery process, whereas a long receiving cycle time points to process inefficiencies. If your warehouse currently has a long receiving cycle time, you may want to consider decreasing the number of deliveries or rescheduling them so that your receiving area has more time to process each incoming delivery.

$$\frac{Total\ Time\ for\ Delivery}{Number\ of\ Deliveries} = Receiving\ Cycle\ Time$$

Put Away KPIs

15. Accuracy Rate

An effective and efficient put away process is one of the most critical components of good warehouse management because it has downstream effects on fill rates, which can lead to congestion in staging areas. Accuracy rate refers to the percentage of items put away correctly the first time; the higher your warehouse's accuracy rate, the more efficient your put away process, with the ultimate goal of a 100% put away rate.

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$$\frac{Inventory\ Put\ Away\ Correctly}{Total\ Inventory\ Put\ Away} = Accuracy\ Rate$$

16. Put Away Cost per Line

The put away cost per line KPI is essentially the same thing as the receiving cost per line KPI, with the clear exception that it measures the cost to put away a line item on a purchase order. Again, the higher the put away cost per line, the less efficient a warehouse's put away process is.

$$\frac{Total\ Cost\ of\ Put\ Away}{Total\ Line\ Items} = Put\ Away\ Cost\ per\ Line$$

17. Put Away Cycle Time

Again, similar to receiving cycle time, put away cycle time measures the total amount of time it takes to put away items. A short put away cycle time is an indicator of an efficient process, whereas a long put away cycle time signifies that there's room for improvement. One easy way to improve your put away cycle time is to rearrange your warehouse or invest in better employee training.

$$\frac{Total\ Time\ for\ Put\ Away}{Total\ Time} = Put\ Away\ Cycle\ Time$$

Safety KPIs

18. Time Lost Due to Injury

It goes without saying that the safety of your warehouse staff is a priority for non-business-related reasons, but the fact of the matter is that injuries sustained on the job can have a serious impact on workplace productivity and overall costs.

Any time an employee misses work due to injury, warehouse managers need to draw on supplementary resources and even offer other employees overtime to make up the difference. As a result, time lost due to injury is a valuable metric to monitor because it can help warehouse managers identify preventative measures they can take to ensure workplace safety in the future.

$$\frac{Lost\ Time\ in\ Hours\ Due\ to\ Accidents}{Total\ Number\ of\ Hours\ Worked} = Time\ Lost\ Due\ to\ Injury$$

19. Accidents per Year

No equation needed here — the accidents per year KPI measures exactly what its name implies. Obviously, every warehouse manager aims to keep this number as low as possible, with the ultimate goal of zero accidents per year.

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20. Time Since Last Accident

Again, like accidents per year, this one's pretty self-evident and is a key indicator of warehouse safety. Think of it this way: You want your number of accidents per year to be low, and the time since your last accident — typically measured in days — to be high.

21. Total Recordable Incident Rate

Your warehouse's total recordable incident rate (TRIR), sometimes referred to as the total case incident rate (TCIR), is the total number of work-related injuries per 100 full-time workers during a one-year period.

TRIR is an incredibly important KPI to track because the Occupational Safety and Health Administration (OSHA) uses this metric to gauge companies' safety performance and monitor high-risk industries. The higher your TRIR, the more likely your warehouse will be subject to surprise OSHA inspections and, potentially, penalties. Your insurance company might also use your TRIR to help determine premiums — the higher your TRIR, the more you pay out of pocket.

$$\frac{(Number\ of\ Recorded\ Injuries\ in\ a\ Year\ \times\ 200,000)}{Number\ of\ Hours\ Worked\ in\ a\ Year} = Total\ Recordable\ Incident\ Rate$$

Cultural KPIs

22. Employee Turnover Rate

Although employees and employees go, a high attrition rate is cause for concern because it usually points to larger issues within your warehouse. Your employee turnover rate (ETR) is a critical KPI because it enables you to gauge the stability of your workforce. If your warehouse has a high ETR, you might want to consider consulting your staff to find out where there's room for improvement.

$$\frac{Employees\ Who\ Have\ Left}{Average\ Number\ of\ Employees} \times\ 100 = Employee\ Turnover\ Rate\ (\%)$$

23. Employee Net Promoter Score

Using the same logic as the Net Promoter Score, the employee net promoter score (ENPS) enables you to determine how engaged your employees are, how satisfied they are with their jobs, and how loyal they're likely to be.

Employees simply rate how likely they would be to recommend your company's workplace on a scale of 0 to 10, with 0 indicating "not at all likely" and 10 indicating "extremely likely." Employees who rate your company anywhere between 0–6 qualify as "detractors," while those who rate it a 7 or 8 are considered "passive"; you should take time to address employees who fall into either of these categories to find out what would make their workplace experience

better and what cultural improvements they recommend. Employees who rate your workplace a 9 or 10 are considered "promoters" and are strong proponents of your company and its culture.

24. Manager Satisfaction Score

Good leadership is a vital component of a strong company culture, therefore, it's just as important to evaluate manager satisfaction as it is employee satisfaction. The easiest way to gauge this is by applying the same concept as the ENPS, except to your team of warehouse managers.

Additionally, you'll want to understand the relationship between managers employees and how that affects overall employee workplace satisfaction. The best way to evaluate this KPI is to conduct anonymous surveys asking employees to rate their managers in order to see how well the management bench is doing.

25. Cultural Entropy Score

Cultural entropy refers to both the amount of energy spent doing unproductive or unnecessary work, and the level of dysfunction within an organization driven by fear-based actions from leaders. To that end, your company's cultural entropy score is a measure of the overall cultural health of your workplace environment. The more fearful your leadership team — meaning, the more given they are to control, manipulation, bureaucracy, internal competition, etc. — the higher your cultural entropy score and, consequently, the lower your level of employee engagement. A low cultural entropy score is an indicator of strong leadership, a culture of accountability and trust, a highly engaged workforce and an overall positive workplace environment.

ECommerce KPIs

Although all of the KPIs listed are important to eCommerce fulfillment performance, there are a few that are critical indicators of your ability to deliver value directly to the consumer:

26. Order Fill Rate

Partially filling an eCommerce order is one of the quickest ways to lose an online sale. Order fill rate refers to the percentage of orders that are immediately — and completely — fulfilled by available stock. A high order fill rate requires seamless visibility between your WMS and your storefront, inventory synchronization and the ability to optimally service customers from various distribution locations. To calculate your order fill rate, divide the number of customer orders shipped in full by the total number of orders placed and multiply by 100.

$$\frac{Number\ of\ Orders\ Shipped\ in\ Full}{Number\ of\ Orders\ Placed} \times 100 = Order\ Fill\ Rate\ (\%)$$

27. On-time Delivery

Thanks to the Amazons of the world, consumers now expect near-instant gratification, meaning online channels must be able to deliver at increasingly rapid rates in order to remain competitive. On-time delivery (OTD) is one way to stay on top of these expectations. OTD is a measure of customer order lines shipped on or before the requested delivery rate. In order to determine your company's OTD, divide the total number of units delivered on time by the total number of units shipped.

$$\frac{Number\ of\ Units\ Delivered\ on\ Time}{Number\ of\ Units\ Shipped} = On-Time\ Delivery$$

28. Time in Transit
As its name implies, time in transit refers to the total number of days or hours from when a shipment leaves your distribution center to when it arrives at the customer's location.