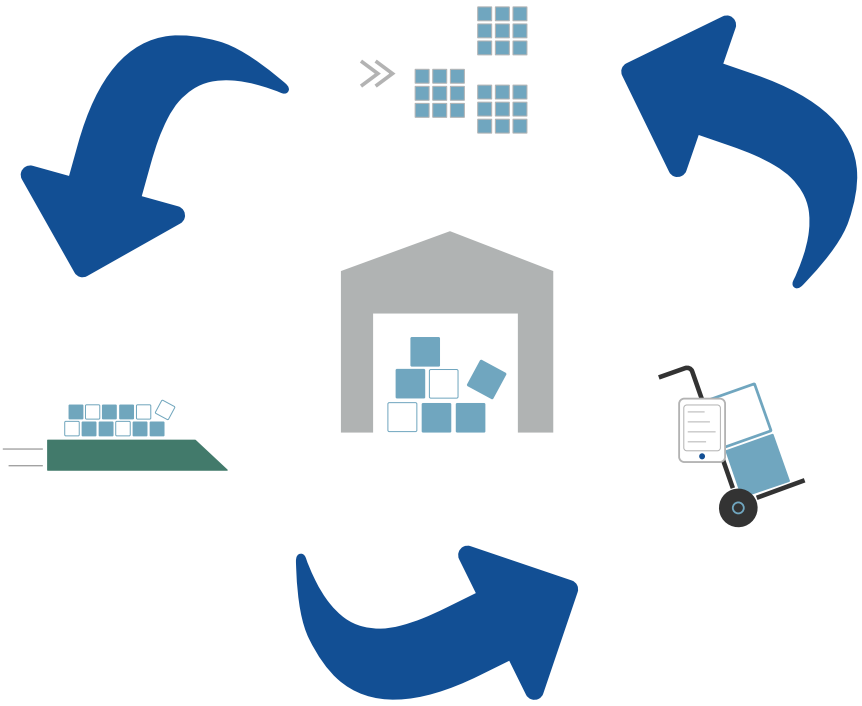


Optimizing Your Warehouse

3 Stages for Controlling the Flow

infoplus

Executive Summary

Inefficiency in warehouse operations and logistics is simply a fact. Combatting inefficiency can be a major way to combat costs. For different stages of warehouse operations, different values need to shape management and operations decisions: **Accuracy** in receiving, **prediction and planning** in layout and storage, and **flexibility and efficiency** in shipping. These differing values translate into different areas of focus when optimizing warehouse layout and procedures. However, all three need to be part of any overall warehouse optimization plan. Ironically, by breaking down warehouse operations into stages, organizations can get a better feel for their requirements and so be in a better place to find holistic solutions, including new technologies.

> Inefficiency just happens. You start with a big empty shell that's high and deep and you slowly begin to fill it as your company grows. Most of the company's efforts are concentrated on generating sales, naturally, and the warehouse gets forgotten. Before long, your warehouse is full, but it's wasted space and you've got a lot of unused potential.
>
> —Matt Grierson, Managing Director at Dexion.

Inefficiency Happens

Receiving, warehousing, and shipping have traditionally been viewed as non-value-adding activities for most organizations. That has changed in recent years with the realization that most warehouses are operating inefficiently. Indeed, a 2002 landmark study out of the Georgia Institute of Technology found that fewer than 30% of U.S. warehouses were operating efficiently, creating huge cost centers with unnecessary waste.[1]

This has put warehouses (and other logistics waypoints) in the spotlight as potential areas for recovering profit. But this drive for efficiency also comes at a time when customer demands and the need for responsiveness are requiring warehouse operations to be faster and more flexible. These requirements have driven technological innovations that operations managers are still trying to sort out.

What is even more confounding is that, for different stages of warehouse operations, different values need to shape management and operations decisions:

- In receiving, **accuracy** is the paramount value, affecting the quality and efficiency of operations downstream;
- In layout and storage, **prediction and planning** prevent loss and maintain efficiency;
- With shipping, **flexibility and efficiency** should be the main focus.

These differing values translate into different areas of focus when optimizing warehouse layout and procedures. However, all three need to be part of any overall warehouse optimization plan. The ironic twist here is that, by breaking down warehouse operations into stages, organizations can get a better feel for their requirements and so be in a better place to find holistic solutions, including new technologies.

Receiving: Accuracy Matters

Think of your typical warehouse as a river or stream flowing from one end (receiving) to the other (shipment to customer or end user). And although the river might meander, there is a continuous flow from one end to the other. Sometimes changes in layout, procedures, or policies affect an isolated area of the stream; other times, a change can have a ripple effect that influences everything that happens downstream.

Because receiving is the first stage, it is the most "upstream" area of operations. For everything to go right during picking, packing, and shipping, a number of activities have to occur correctly during the receiving process. Likewise, mistakes made during receiving and storage will tend to cascade downstream and create problems during these more labor-intensive steps.

For these reasons, **accuracy** should be the main value informing positive changes at the receiving stage. Ensuring accuracy means a focus on automation and quality control.

Using automated systems to anticipate shipments

For many operations, facility managers aren't even aware of incoming shipments until a truck arrives at their dock. This almost guarantees that unloading and storage will occur in a haphazard fashion.

Modern facilities integrate ERP purchasing systems and inventory software with Advanced Shipping Notices (ASNs), setting up alerts when incoming shipments are expected. This allows warehouse managers time to organize labor and plan for property accuracy, quality control, and storage.

Ensuring accuracy

What happens when the items that arrive are not exactly what was ordered? To ensure accuracy, employees in receiving need to be able to match what was ordered with what arrives. If there is a problem, they will be able to flag it on the spot and request an additional order, demand a refund, or send back unordered goods.

Furthermore, items should be entered into your WMS (Warehouse Management System) right away so that the software accurately reflects actual inventory levels. This will help prevent backorder situations, especially for popular or seasonal items.

Performing quality control

Along with checking accuracy of the order and counts, individual items will need to be inspected, grouped, and possibly labeled. Damaged items should be estimated, noted, and compared against a predetermined benchmark for acceptable damage. For example, many facilities allow for 1% damage, based on a sample of incoming goods. Under that percentage, they will acknowledge receipt; over that, they will reject the shipment. Your facility will need to determine what is an acceptable limit for your industry and business model.

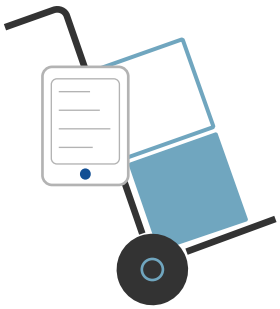
Quality control is even trickier for perishable items. During receiving, steps must be taken to ensure that lots are not mixed and that FIFO rules are followed. Lots need to be tracked through your facility in case a recall is issued.

Finding and deploying efficient storage

Once items have been received, inspected, and catalogued in your system, they will need to be stored in the most efficient way possible. Available warehouse space should already be identified and readied. Popular or fast-moving items should be stored in such a way that they can be easily accessed by pickers, even when the warehouse is busy. Like items should be stored together, with individual lots clearly labeled. Shelf and pallet arrangements should make it easy to pick the correct items, depending on whether you use FIFO, FILO, or some other inventory accounting method.

Receiving Accuracy in a Nutshell

- Integrate ASNs with ERP to signal incoming shipments
- Match received items with purchase orders ASAP
- Enter items into WMS upon receipt
- Quality control against a known benchmark
- Find and deploy efficient storage



Layout and Picking: Prediction and Planning are Key

Managing an inventory for efficiency always involves trade-offs between pick velocity and the space you have available. Here, **prediction and planning** are the values warehouse managers should focus on.

Gone are the days when warehouses were static things: Glorified storage sheds where items and people seldom moved. Today's warehouse are places where a constant stream of goods is being managed. Like the farmers of old, warehouse managers need to be ready for floods and for dry times, always calculating the ideal channels for their goods, no matter how fast or slow the flow.

Optimizing pick paths

Efficient picking paths will lead to more efficient picking—that is, more time preparing orders and less time moving about the warehouse. On the other hand, if picking paths are not optimized, it can lead to excessive travel times, which culminate in slower turnaround times and unnecessary labor costs.

To avoid those costs, think about optimizing layout in terms of picking paths. Items that are often purchased together should be stored near each other. Orders should be fulfilled in such a way that individual items in one area are picked before moving to the next area. And picking order should be linear, with warehouse employees completing their picking run at a location close to the final shipping area.

Deciding to use forward staging

Forward staging refers to having a set amount of stock in a forward location in your warehouse close to where packing and shipping will occur. When an order for one of these items comes in, an employee will choose items from the forward location for the customer. As the quantities in the forward location get low, replenishment stock from elsewhere in the warehouse is brought forward.

In general, if an item needs frequent replenishing, it should be situated in such a way that pickers have easy access. If an item is bulky, heavy, or otherwise cumbersome to handle, it needs to be stored in a way that makes storing and picking easy.

That said, knowing which items can best benefit from forward staging depends on the answers to several questions:

- What moves fast (high velocity) and what moves slow (low velocity)?
- What items are typically sold together?
- Which items are seasonal, and when does their sales velocity pick up?
- Which items need strict lot control? Which needs to be first-in first-out (FIFO)?

For peak efficiency, these questions need to be asked and answered with the most up-to-date data available. It is not uncommon for adjustments to be made in staging every couple of weeks.

Reserving areas for “dead” stock

Most organizations do not have a “dead stock management plan,” but they should. There are many reasons why items might need to be stored but are not ready and available for shipment: Product recalls, customer returns, items that are no longer carried and destined to be sold in bulk at a discount, and so on.

These are typical situations; the problem comes when this “dead stock” is nestled among the regular inventory. At best, it gets ignored and just continues to build, taking up valuable warehouse space. At worst, pickers mistake it for live stock and reship items.

Warehouse layout plans should anticipate the various kinds of dead stock and plan on separate areas for them. These areas should be readily distinguishable from typical inventory areas at a glance.

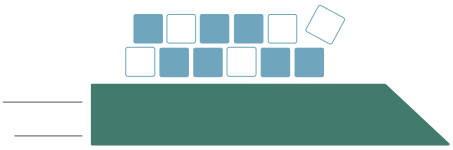
Planning for growth and expansion

Organizations that grow will need to expand their warehouse space. Additional space costs money, however, so accurate projections are needed to predict exactly the amount of space that will likely be needed. (No one wants to pay for unused space unless they have a guarantee of carrying more stock in the future.)

A good plan should anticipate shifts in market demand (including seasonal changes), inventory, and process changes at least five to 10 years out. It should also outline contingencies for dealing with these changes—for example, when and how to incrementally add pallet racks, how to manage overstock space, when to ship to a remote long-term storage location, and so on.

Layout Planning in a Nutshell

- Store items frequently purchased togethers
- Keep pick order linear
- Use forward staging for high-velocity items
- Reserve areas for dead stock
- Predict growth, plan for expansion



Shipping: Flexibility and Efficiency Save

Whereas best practices for receiving need to revolve around accuracy, and best practices for layout and storage should focus on **prediction and planning,** optimizing downstream client-focused activities like packing and shipping should revolve around **flexibility and efficiency.**

There are few other areas in the warehouse where waste is readily and visibly apparent. Excess packaging and boxing is one obvious sign, incorrect or delayed shipments is another. While true that upstream processes must be optimized in order for packing and shipping to go smoothly, there are many ways to calculate more efficient ways to ship, thereby saving both time and costs.

Packing efficiently

Packing an order for shipping requires materials with a cost: Boxes, poly bags, packing material, tape, address labels, and so on. The cost of these items, as well as associated shipping costs, rises with the size and amount used. Hence, using smaller boxes, less packing material, and less tape makes the material cost per shipment slightly lower. Multiply that by a few thousand shipments a month, and the savings are far from negligible.

Today, software algorithms can automatically generate instructions for the most efficient ways to pack orders. Many can also find the lowest shipping rates for that specific package when done. Take advantage of these to cut down on wasted material.

Managing labor well

Labor costs can stealthily sneak up on even the most efficient operations. This happens because labor needs are variable: During high shipping times, warehouses need an appropriate number of workers to handle the increased number of orders. But these cannot be full-time workers, as having extra people around when the work does not necessitate it is very costly.

Variable labor requirements prompt most warehouses to hire temporary laborers to help with periods of high demand. Ideally, these workers need to be called in just before the spike in orders. Afterward, the floor manager needs to feel comfortable releasing them once the rush is over. A good labor management system, then, is key. The best of them employ a "management by exception" system that can be especially useful in alerting the right managers when spikes in demand occur.

Shopping carriers

Too often, smaller shippers get saddled with a single carrier for all their shipping. While this might be convenient, there is no carrier that provides the lowest rates and best service for every location and every product. So there are hidden efficiencies to be unearthed in choice of carrier as well.

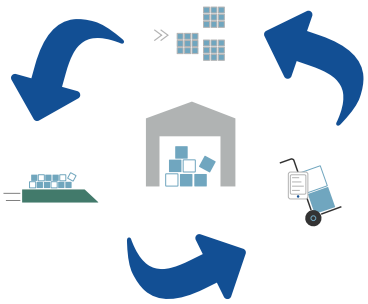
Even a decade ago, the way larger shippers went about this was to have a single person on the phone (or surfing websites), trying to find the lowest rates and negotiating deals with multiple carriers. It took time, and even then results were rarely guaranteed…or even measured. Still, shopping multiple carriers is a necessity for getting the best rates and fastest ship times.

Just as a smart software solution can quickly identify the most efficient ways to pack a shipment, software can find the most efficient shipping as well. The technology is not complicated. It simply needs the right integrations and the ability to handle real-time data.

In fact, the best solutions have ways of integrating the packing and shipping processes. They can recognize what services are needed (ground versus air, for example) without dictating which specific carrier must be used. Shippers simply indicate the geographic region shipping from and shipping to, and then specify either a "need on" date or a "deliver by" date. The software can then choose the optimal packaging and optimal carrier, ensuring safe and speedy delivery while minimizing cost.

Shipping Efficiency in a Nutshell

- Use software to pack efficiently and limit waste
- Predict surges to manage temporary workers
- Shop different carriers for the best deals



Bringing it All Together

Each stage in the "flow" of goods in your warehouse should have a different focus for ensuring efficiency and meeting process goals. To a degree, these different stages can be improved independently of one another, although improvements will tend to cascade and reinforce one another.

Still, one should not just improve a stage and then stop. All three stages, and their improvement, should be part of an overall optimization plan. This way, solutions like improved WMSs, scanning technology, and so on can be evaluated in light of their ability to improve all stages.

So, ironically, breaking down warehouse operations into separate stages with distinct aims and values allows decision-makers to get a better feel for their overall requirements, and a better means for assessing holistic technology solutions.

[1] McGinnis LF and others: Benchmarking warehouse performance. W.M. Keck Virtual Factory Lab, 2002. <http://ise.tamu.edu/ideas/DEA06.pdf>
[2] Aldred T: How to manage an effective warehouse. Guardian Small Business, 4 Aug. 2016. <www.theguardian.com/small-business-network/2014/jan/03/how-to-manage-effective-warehouse>