

Achieving Better Warehouse Management:

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Warehouse Management Systems are becoming more popular as supply chain logistics become ever more complicated along with increasing customer demands. With an escalating volume of inventory movement, many organizations are turning to technology to streamline operations and meet these challenges.

Advanced technology through Warehouse Management Systems (WMS) allow companies to respond to evolving market pressures and deliver on ever-shrinking time to delivery windows. These systems efficiently capture every scan, every movement of inventory and are designed to make both accuracy along with cost reduction a top priority. The following article can give you some insight into methods, obtained through warehouse technology, for achieving better warehouse management that are key to modern business supply chain logistics in addition to reaching your organization's goals.

Topics discussed include:

- Automation
- Inventory Control
- Cross Docking
- Picking Options
- Space Utilization
- Labor Management
- Multi-Carrier Shipping
- Reporting
- Boosting Customer Service
- Bonus Discussion



Automation:

Too many warehouses today are relying on manual processes which inevitably increases inventory errors and inaccuracies on a continual basis. Spreadsheets, paper and standalone systems can't deliver the inventory accuracy and supply chain visibility it takes to stay competitive these days.

Think about the below real-life examples:

- You're poised to win your first contract with a major retailer. This means new complexities and compliance concerns, as well as the possibility that chargebacks will wipe out your profits if you don't automate.
- You're moving to a new warehouse. There's no way you want to keep your outdated, manual processes at the new facility; it's simply not feasible.
- You're looking at complementary warehouse technology, like carousels and conveyors. But why speed up materials handling if you don't have a system to give you visibility into what's going where?
- You're involved in a merger or acquisition and are concerned that you won't be able to scale warehouse activities to match your growth without putting a WMS (Warehouse Management System) in place. Further, a WMS can provide the metrics management needs to predict growth potential, as well as reveal the underlying cost structures required to efficiently integrate new lines of business.
- You don't want to go through another peak season with your current processes. That leaves two options: curtail that impending growth or automate.

WMS technology is designed to create highly efficient processes through advanced functionality and automation for handling inventory and picking orders that will eliminate the inefficiencies along with certain mistake riddled processes that plague most manual-driven warehouses or absent warehousing functionality systems. WMS technology can be equally powerful as some ERP system; yet complimentary to bring about a total well-managed supply chain solution.

Inventory Control:

The proper and correct movement of inventory in your warehouse is critical for accuracy while also ensuring elevated customer service levels in addition to remaining competitive. Consider the basic warehouse step of receiving goods as an example and how WMS can be of great assistance.

Receiving is a key functionality designed to migrate the paper receiving process to a wireless device. Once a purchase order has been entered into an ERP (Enterprise Resource Planning) system, it is seamlessly transferred to the Warehouse Management System where receivers await shipment. They are armed with wireless mobile computers that have integrated barcode scanners. After an inbound shipment arrives at the warehouse, the receiving team will typically unload the truck and grab the paperwork to identify which purchase orders are being received.

The first job of the WMS is to receive items accurately into the warehouse and then reconcile the shipment against the original purchase orders entered into your ERP system. Rather than using pen and paper to reconcile physical receipts, the receiver will bring up the purchase orders on a handheld computer. Once this is done, the receiver only needs to start identifying the product that is being unloaded (in no particular sequence).

With “best-in-breed” WMS Software, the receiver counts down against items being received right off of the container. It validates items against multiple purchase orders in the background, and then seamlessly updates your ERP system. No more paperwork!

Because a receipt is recorded as soon as items are entered into the handheld, stock may be immediately put away to a bin location. Bin location assignment following receipt may be automatic; stock can be transferred to a temporary receiving location if receipts are to be staged prior to put-away.

Most of the time, stock will be put-away following goods receipt. If there are backorders waiting for product (standard or non-stock) or there is a “low stock alert,” stock may be put away directly to pick locations. Otherwise, stock handlers will move pallets into bulk locations (typically up in the pallet racks or on floor stacks).

Some of the highlighted benefits for accurate and efficient warehouse receiving include:

- The ability to receive multiple orders simultaneously in no sequence, without paperwork.
- Scanning product bar code or use quick lookup functions to identify products as they are being received.
- Printing carton or pallet-ID labels as product is being received.
- Receiving multiple pack-sizes on the fly.
- Cross-dock non-stock items to forward pick locations. (We will discuss cross-docking next).
- Immediately put product away without staging.

Efficient receiving is just one area in which WMS can greatly improve accuracy and control the proper flow of inventory. Warehouse technology encompasses receiving, picking, packing and shipping goods in the best manner possible. This not only saves time and money, however, also keeps your company competitive along with being up-to-date with the latest supply chain movement standards.

Cross Docking:

Cross Docking is a way to improve inventory warehousing by implementing a protocol to move inbound goods once received to a staging area, i.e, “cross docking” area, instead of warehousing and storing these products. Inventory, therefore, is moved from the inbound dock to the outbound dock ready for shipment. The practice of warehousing cross docking is not appropriate to use in every situation. However it is, for example, used in certain situations when products have an expiration life and have to be transported in a short period of time. Another example are already packed goods to a customer which can also benefit from Cross Docking and make the movement of these goods more efficient by reducing handling time. It is important, though, that your warehouse can accommodate this new movement of inventory, traffic and warehouse space.

Picking Options:

The flexibility to have multiple inventory picking options can greatly increase warehouse efficiency. The Picking functionality in warehouse management systems is another core functionality designed to move the paper picking process to a wireless device by the most optimum method available.

Warehouses come in different shapes and sizes. Some are “wide open” in a square shaped space. Others are contained in buildings on multiple floors, utilizing elevators to transport materials. Warehouses will have varying ceiling heights. Some might have yard space. Materials handling will differ by product shape and size. As a result, the warehouse racking infrastructure will vary by product size. Many warehouses keep large products in bulk stacks or pallet racks. While with small products, picking efficiency may be increased by storing smaller products in flow racking or static shelving.

Product velocity and order types also affect warehouse layout and consequently the picking strategies. Companies that ship single-sku (stock keeping unit) pallets of product to customers will have significantly different warehouse operations than ones that ship trailer loads of mixed-sku pallets (grocery is a good example of this). Even subtle differences in customer requirements for consumer products wholesalers will have substantial effects on the materials handling and picking. Operations that ship to retail distribution centers will have different fulfillment requirements than those that ship directly to stores.

Everyone can probably agree that customer demand appear to only be increasing recently and that supply chain movement is becoming ever so complex. Warehouse Management System have an abundance of picking styles that will accommodate a warehouse manager’s fulfillment strategy

independent of warehouse layout, product size, velocity and order characteristics. Let's explore these.

Wave Picking: The Wave Picking function allows a picker to gather multiple orders simultaneously on a pick run. Orders are picked directly into serialized shipping cartons. The advantage of Wave Picking is that orders are picked and packed and checked in a single handling step using barcode scanners. Wave picking is very effective for operations that pick to cart when there is an average of one or two shipping cartons per order. It is also effective for high volume operations that pick product out of flow racking to conveyor belts that whisk away boxes after they have been filled.

Batch Picking: There is a subtle difference between Batch Picking and Wave Picking. Rather than picking multiple orders directly into shipping cartons, Batch Picking does not prompt the picker to specify the sales order during the gathering process. The result is a "Batch" of product for multiple orders is gathered, and then sits in a staging area until distributed into the individual order pallets or cartons for shipment. The advantage of Batch Picking is that more product cube can be gathered in a single pass of the warehouse.



However, warehouses need to ensure that they have enough space to stage the orders that have been batch picked. Batch picking is effective for operations that will benefit from maximizing order consolidation, especially in larger warehouses where the amount of travelling required to gather orders would be substantially decreased by maximizing the cube gathered in a single pass. Operations with limited picking equipment resources (like man-up or narrow-aisle equipment) should consider batch picking to maximize equipment utilization.

Cluster Picking: Cluster Picking is a workflow that can significantly reduce average travel time per pick. With Cluster Picking, multiple orders are grouped into small clusters or waves. An order picker will pick all orders within the wave in one pass using a consolidated pick list. Usually the picker will use a multi-tiered picking cart maintaining a separate tote or carton on the cart for each order. Wave sizes usually run from 4 to 12 orders per wave depending on the average picks per order in that specific operation. In operations with low picks per order, Wave Picking can greatly reduce travel time by allowing the picker to make additional picks while in the same area.

Zone Picking: Zone Picking is the order picking version of the assembly line. In Zone Picking, the picking area is broken up into individual pick zones. Order pickers are assigned a specific zone, and

only pick items within that zone. This method divides up aisles of bins so that individual pickers only work in a specified number of aisles.

In Zone Picking it's important to balance the number of picks from zone to zone to maintain a consistent flow. Zones are usually sized to accommodate enough picks for one or two order pickers. Creating fast pick areas close to the conveyor is essential in achieving high productivity in zone picking. Zone Picking is most effective in large operations with high total numbers of SKUs, high total numbers of orders, and low to moderate picks per order. Separate zones also provide for specialization of picking techniques such as having automated material handling systems in one zone and manual handling in the next.

Space Utilization:

As we have mentioned, warehouse Management Systems are designed with savings in mind to manage your inventory in the most efficient manner possible. However, additional benefits can be recognized in other areas, such as cost saving associated with reduced labor and administrative costs, plus also an increase in customer service levels. Another area as well includes both efficiency gains and reduced cost is in the area of better space management for your warehouse.

Consider the following. Can you eliminate or minimize the need for outside storage? If so, you have the direct savings of reducing lease cost (normally on a \$ per sq. ft basis), insurance, and possibly transportation costs. Depending on the size, complexity and activity of the off-site storage, you may even be able to save labor costs associated with managing and transporting the inventory back and forth. Improvements in space utilization generally range from 5-15%.

A Warehouse Management System (WMS) tracks every location and knows where each product and quantity received should be stored. Put-away can be directed to maximize space utilization, minimize put-away travel, minimize pick travel, or some combination. The WMS knows the size and weight of each item, case and pallet, and the physical constraints of each location.

Material is placed in an appropriate location based on these criteria and other pre-configured put-a-way rules pertaining to forward pick location replenishment, product velocity, storage requirements, etc. Space utilization improvements are generally step functions. In a typical situation where the distribution infrastructure is owned, the creation of empty space in the warehouse produces no real benefit. The amount of space made available must be enough to provide for other activities.

For instance, if 500 ft² are freed up, this will provide very little benefit. If, however, 5,000 ft² becomes available, several alternatives can be presented for the new space. For internal space savings, if enough space is made available to avoid new construction expansion or a green field site, this can be directly qualified as a cost avoidance.

Another example to consider is, if enough new space is now available to be used for light manufacturing, value added services, offices, etc.; this can be classified as a savings. If the new space can be subleased, this can also be classified as an incremental cash inflow. However, you

must also consider the potential cost of refurbishing the facility as required by the potential tenant. Additionally, location utilization is improved by using a WMS. A non-automated operation is generally considered at capacity when 80% of the locations are being used at any given time.

A new result is through WMS technology, operating capacity can be dramatically increased. This improvement is due primarily to the WMS's ability to continually manage inventory consolidations, re-warehousing activities, and mixed item locations.

Labor Management:

Reducing or allocating labor is another important driver for exploring warehouse management solutions and recognizing a return on investment (ROI). A properly implemented WMS system can reduce your labor needs, help you reallocate staff and or keep you from needing to bring on more staff to meet growing sales or seasonal fluctuations. Additional workers add to an already complex and hectic warehouse. There is a long list of labor areas that are strongly impacted by the implementation and use of best practices while deploying a WMS.



From the moment product hits your receiving dock until the invoice is sent for the shipped out items people are involved. By using a WMS, you increase the efficiency and accuracy of the work they do while eliminating the mistakes they will make. A best of breed WMS should provide useful labor reports that can help you determine who your best people are and who needs help. When the WMS is integrated tightly to ERP/Accounting/Business Management System you can eliminate the costly clerical work. This allows the people doing this manual data entry to be re-positioned into areas that will help the company make money not just spend it. Another plus here is the accuracy factor a WMS provides. You can also speed up the invoices process which gets you paid in a more timely manner.

Areas of labor management improvement with WMS technology include;

- Lines picked per shift are improved.
- Fill rates increase.
- Inventory accuracy is dramatically improved.
- Reduced staff and increased work volume.
- Higher pick/pack rates.
- Reduced shipping department needs.
- Shift elimination and or hour reductions.
- Transportation cost are optimized.

Multi-Carrier Shipping:

Checking the proper and efficient inventory movement should continue when we discuss shipping. Any sort of shipping solution should have the ability to shop all of major carriers which can select the best choice available. By leveraging a powerful multicarrier rating engine will also allow you to automatically select the cheapest carrier, mode, and service level that meets your delivery time frames. Warehouse technology to including multi-carrier shipping will all you to reduce your shipping costs, track every shipment, and maintain valuable key performance metrics all while gaining accurate shipping compliance and superior customer service. A seamlessly integrated shipping functionality in WMS will eliminate fixed packing stations and shipment paperwork to reduce costly manual errors and increase shipment reliability

Reporting:

Measuring results on a consistent basis is a key to determining if newly implemented warehousing initiatives and strategies are effective. With modern warehousing technology, this is accomplished through the ability to create, manage and view Key Performance Indicators (KPI's) dashboards and analyze ad-hoc business intelligence using pivots, drill down, charts, and graphs. With this type of warehousing technology module, gives the ability to measure your operation's performance and the success of your business with simple, digestible KPIs that measure people, processes, and inventory. Relevant and robust warehouse business reporting provides real-time visibility into your entire extended enterprise. Modern technology systems will allow you to view historical trends and real-time metrics that inform your decision-making. It can even intersect your Supply Chain data with other external data sources, such as your ERP (Enterprise Resource Planning System).

Boosting Customer Service:

Another result of WMS technology is the ability to enhance your customer satisfaction numbers and most likely help you attract new customers without adding to your workforce.

Although sometimes more difficult to quantify, such as a firm return on investment figure, an increase in better customer service levels is a positive intangible result from warehouse technology. Whether your business sells directly to consumers or to retailers or both, being able to provide quality customer service is the deciding factor for repeat business for many customers. As a result of warehouse management system functionality, orders are more accurate, they are filled faster, and there are fewer back orders. Furthermore, advance ship notices and EDI compliant labels can be automatically created and sent. Specific customer needs can be noted and fulfilled by the system. All of these contribute to less shipping errors and service level improvement, which translates into happy customers and reducing charge back and penalties.

In working with a large retailer, being able to comply with their EDI requirements, including advance shipment notices, it is necessary in order to avoid orders being sent back, and being liable for all the chargebacks and penalties associated. A warehouse management system with EDI capabilities eliminates all of those costs by creating retailer-specific labels and ASNs (Advanced Shipping Notice) for every order automatically.

Avoiding stock-outs can contribute a lot to the bottom line in addition to improving customer service levels. The more often you have orders fulfilled quickly and the less back-ordering your customers experience, the more likely they will be to keep returning. If customers get frustrated waiting for their order to be filled, they many go elsewhere for that product or simply move to another provider altogether. It also contributes to less wasted time and space holding orders, splitting orders, paying for shipping, and time wasted by an employee traveling to an empty bin.

A warehouse management system that integrates with your ERP makes business flow much smoother and allows for easier and more accurate tracing of costs. The WMS System can be customized to your accounting methods so that inventory can be tracked, and the re-ordering process can begin when necessary. Orders can be tracked as well, invoices can be sent to customers at the appropriate times.



This eliminates the question whether inventory was accounted for, if orders were paid, and the possibility for revenue loss due to the misplacement of physical pieces of paper for orders.

Bonus Discussion:

Dedicated Bins vs. Random: There are two primary material storage philosophies; fixed or dedicated bins and random or floating. In dedicated bin storage, each individual stock keeping unit (SKU) or item is assigned a specific storage bin. A given SKU will always be stored in a specific bin and no other SKU may be stored in the bin, even though the bin may be empty. Dedicated bin storage is analogous to a classroom where each student is assigned a specific seat.

With random storage, any SKU may be assigned to any available storage bin. An SKU in bin A one month might be in bin B the next and a different SKU placed into bin A. Random bin storage is analogous to the assignment of rooms in a hotel. When a guest checks in they are randomly assigned a room (based on the guests pre-defined criteria).

The amount of storage space required for a SKU is directly related to the storage philosophy. If dedicated storage is used, a given SKU must be assigned sufficient space to store the maximum amount of the SKU that will ever be on hand at any one time. For random storage, the quantity of items on hand at any time will be the average amount of each SKU. In other words, when the

inventory level of one item is above average, another item will have a below average level; the sum of the two will be close the average.

Often the storage philosophy chosen for a specific SKU will be a combination or hybrid based on where the SKU is in the storage process. A grocery store is an excellent example. Dedicated bins are used on the store shelves where the consumers can easily find what they are looking for, and not stored (on purpose) in any other bin (promotions excluded). In the back storeroom however, the excess stock is usually stored randomly, wherever there is a bin. Because combination storage bin is based on a mix of fixed and random storage, its planned inventory level falls somewhere between the fixed and random quantity.

Choosing one storage philosophy over another means making a number of trade-offs between space, accessibility, and material handling efficiency.

Use of space in a dedicated bin model is poor because space for the maximum amount of inventory that will ever be on hand is allocated, although actual on hand inventory will normally approach the average inventory level. Therefore, excess empty space and bins are common in dedicated storage. Random storage is extremely space-efficient because the space requirements are only 15% above the average amount of inventory expected on hand.

Material in dedicated storage has excellent accessibility. Blocked stock is not a problem because each bin contains only one SKU and the bin of each item is known (remains constant). Accessibility to stock in random storage can be good but requires more management especially if a materials tracking system is not in place or kept up to date. Without good management or a tracking system, using random storage will result in blocked stock, lost material and eventually obsolete inventory.

Dedicated and random storage score equally well for material handling. With either, inventory is typically handled during the put-away process and then again during picking. Combination storage is typical of a forward pick and reserve storage strategy requiring a replenishment flow. This replenishment adds another product touch as inventory is moved in smaller loads from the reserve (random) bins to the forward (dedicated) bins for picking.

Dedicated storage trades space efficiency for better inventory accessibility and vice-versa for random storage. Combination storage trades material handling efficiency for middle of the road efficiency in space and accessibility. Which is best for your operation is unfortunately not a clear-cut decision and will depend on several other factors. The only general conclusion to be made is the poor use of space in a dedicated bin strategy is a big negative. Compared to the use of space in a random strategy, a dedicated bin strategy will generally require 65-85% more space. With the escalating cost of money, land and construction, few companies can afford to design fixed bin storage warehouse. This factor alone can justify the investment in technology to help manage a random storage warehouse.

Conclusion:

There are many benefits of modern warehousing systems which can dramatically increase inventory accuracy, streamline your supply chain and also boost customer service levels. For today's inventory intensive businesses to stay competitive and meet customer's demands in an ever-increasing complex warehousing environment, technology to meet these challenges is available and should be part of any modern supply chain system.

About iCepts Technology Group, Inc.

Since 1980, iCepts Technology Group, Inc., a 100% employee-owned company, has been working with wholesale distributors, manufacturers, and other industries with various supply chain management and other technology solutions.

Our consistent goal is to leverage our vast industry experience to partner with organizations to achieve greater efficiency, streamline operations and gain access to vital business reporting in order to stay competitive plus profitable through the use of technology.

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The logo for iCepts features a stylized lowercase 'i' in red, followed by the word 'Cepts' in a black, elegant script font.