

The concept of system directed putaway was discussed briefly in the article *What is a WMS?* This article explains system directed putaway in more detail; what it is and how it works. The goal of this article is to help the reader understand the concepts and terminology of system directed putaway.

Locating inventory (putaway) is a key capability of a warehouse management system (WMS). Putaway is normally thought of as the process of moving received inventory from the dock, kitting area, or production department to a storage bin. The putaway process is also used to relocate inventory within the warehouse and to replenish dedicated storage bins with inventory from a reserve storage bin. Any time inventory is being placed in a storage bin it is being put away. System directed putaway is when the WMS chooses the destination storage bin rather than the operator.

The benefits of system directed putaway versus operator directed putaway are

1. The WMS consistently follows inventory storage rules to improve space utilization and increase storage capacity
2. The system consistently follows inventory storage rules to make picking more efficient
3. Warehouse workers do not need to be familiar with all of the products the distributor carries in order for inventory to be placed in the correct bin
4. It is faster – the operator does not have to look for a bin that contains the same item or search for an open bin. For example:
 - a. The WMS can determine if the inventory to be put away will fit in the dedicated bin for the item and send the operator there depending on available capacity and/or lot mixing rules
 - b. The WMS can determine if the inventory to be put away will fit in a partially full bin that contains the same item (not the dedicated bin for the item) and send the operator there depending on available capacity, zoning rules, and/or lot mixing rules

A good system directed putaway function finds storage bins based on velocity, storage requirements (refrigerated, hazardous, wire storage system, etc.), and usage requirements. Velocity is how often an item in a specific package configuration (most often called package type) is picked to satisfy sales, transfer, kitting, or production orders. Some examples of package types are carton, pallet, bundle, and bag. There are two key words in the above phrase. The first is package configuration; putaway rules are not just by item, but consider the manner in which the item is packaged as well. The second key word is “picked”. The directed putaway function stores inventory in order to make picking more efficient.



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All discussion of system directed putaway is with respect to a single location (warehouse or distribution center). An item in a specific package type at a given location will be referred to as a SKU (stock keeping unit) for the remainder of this article.

An ABC coding scheme is used to assign velocity codes for putaway. A velocity code of “A” is assigned to the SKUs picked most often. A velocity code of “B” is assigned to SKUs picked the next most often, and so on. Note that a velocity code is assigned to a SKU, not an item. For example, a carton of an item could be assigned a velocity code of “A” while a box of the same item could be assigned a velocity code of “C”. Velocity code is not concerned with type of item, weight, dimensions, cost, customer, or vendor; just how often the item is picked. This is a different ABC code than is used for purchasing.

System directed putaway based on velocity stores items picked more frequently in bins that are more accessible (knee to chest high near the shipping dock) and items picked less frequently in bins not as accessible (up high in the back of the warehouse). This reduces travel time during picking which helps to improve picking efficiency.

Package type and storage requirements are considered next when selecting a storage bin. Pallets and individual cartons are usually stored in different areas of the warehouse. The same is true for bundles of threaded rod, spools of wire, and hazardous materials; items that require special storage. Storage areas for cartons may be further broken down for large vs. small cartons or heavy vs. light cartons. Package type and the type of storage used determine the material handling equipment required to put away and pick the inventory.

The third factor to consider for system directed putaway is how the inventory is used. Inventory may be used for sales orders, production, or for kitting. Do orders for clean room supplies only include clean room supply items? If so, then it can be productive to store all clean room supply SKUs together. If sales orders for products from a given vendor only include items from that vendor then it would be productive to store the SKUs from that vendor together. If a customer predominately orders items that only that customer uses, then those customer-specific SKUs should be stored together. Otherwise SKUs should be stored based on package type. No matter how SKUs are grouped for storage (package type, customer, vendor, or type of business) storage bins within each section of the warehouse are selected based on SKU velocity. Other factors can come into play for selecting storage bins, but velocity, package type, and how items are sold work most of the time.

The three factors described above (velocity, package type / storage, and how items are sold) are used to build putaway zone lists. Putaway zone lists tell the WMS how to find a bin for inventory that needs to be put away. There may be putaway zone lists for “A”



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velocity items stored in full pallet quantities, “C” velocity items stored in boxes, “B” velocity items only used by a single customer, or “B” velocity bundles of threaded rod. Putaway zone lists are specific to a warehouse. Depending on your software you assign a putaway zone list to a SKU or the WMS deduces which putaway zone list to use for each SKU depending on the value of the three factors for the SKU.

A putaway zone list is literally a list of putaway zones. The warehouse is divided into putaway zones. Each putaway zone contains a group of storage bins. The bins in a putaway zone are of roughly equal value for some group of SKUs when the WMS is searching for a storage bin in which to place inventory. For example, a putaway zone may contain bins for fast moving carton items or slow moving bar stock. A section of shelving, floor storage bins, one or more sections of pallet rack, or a cabinet of drawers could be putaway zones.

The first putaway zone in a putaway zone list is the preferred putaway zone for the SKU. The WMS looks first for a bin in which to place the inventory in the preferred zone. If a satisfactory bin is not available in the preferred zone, the WMS looks in the second zone in the list, and so forth, until a suitable bin is found or the putaway zone list is exhausted.

Other rules can come into play when the WMS is looking for a bin in which to place the inventory to be put away.

- The WMS could look for a bin that is dedicated to the SKU first to determine if there is enough capacity available
- The WMS may look for an empty bin in the preferred zone before it looks for a bin with available capacity that already contains the same SKU in another putaway zone
- There could be limitations concerning mixing lots of the same SKU
- Rules about filling a bin that contains the same SKU where the age difference is too great (when there are expiration or recertification considerations) could apply as well
- Additional rules apply to the storage of hazardous inventory

A putaway zone could contain many bins. Each bin in a putaway zone is assigned a putaway bin ranking. The putaway bin ranking tells the WMS which bin is better to choose when the WMS finds more than one bin in a zone in which the inventory could be placed. For example, a bin closer to the dock would be assigned a better (higher or lower depending on your software) putaway bin ranking than a bin that is further from the dock.

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