Effective slotting improves the placement of your inventory to reduce picking time, improve service levels, adjust for seasonal or nonseasonal demand fluctuations and maximize your warehouse space.
Slotting: Space Management for your Warehouse

IMPROVING EFFICIENCY THROUGH OPTIMAL PRODUCT LOCATION

In managing a warehouse or distribution center, the placement of inventory is perhaps the most critical element in the efficiency of the entire operation. Unit and case pick distribution operations invest between 50 and 70 percent of their warehouse labor budget on the outbound order process (picking, packing and shipping). Consultants and other experts estimate that fifty percent of the activity performed by workers assigned to these tasks is travel between pick locations.

A warehouse manager or consultant may devise the world’s most elegant slotting solution but unless it is evaluated and maintained regularly, costs may begin to edge upward, slowly eroding profitability, because quite simply, nothing remains the same. Slotting is simply the assignment of a specific cube of space to a specific product or purpose. The question of when and how to slot – that is, to make or revise the slot plan of an existing warehouse or distribution center is not an easy one to answer.

One industrial distributor, for example, established a new facility and slotted it successfully under an SKU sequential number scenario. Unchanged fifteen years later, the operation nearly hit the wall as the distributor ran out of ways to slot its constantly growing and evolving product line. The initial excellent slotting model had continued to degrade with time.

THE WAREHOUSING CHALLENGE

Multiple analyses have demonstrated that merely slotting SKUs by velocity and distance from a preferred point can bring labor costs down by as much as 10 percent. Refining the slotting model to further streamline the picking process can yield still broader labor savings as well as increase available floor space and cube capacity with no additional capital investment.

Thus, slotting impacts deployment of the workforce, the allocation of available space, the service rendered clients or customers and ultimately, the profitability of the enterprise. In creating or modifying a slotting solution a matrix of factors apply that should be revisited periodically. Sometimes modest adjustments will be indicated; at others, major reconfiguration.

Among the strategic factors impacting slotting policy:

- Product evolution and rotation – static, expanding and contracting inventory
- Seasonality – predictable adjustments of stock quantities and positioning
- Demand fluctuation – nonseasonal influences on inventory movement
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- Labor force – staff utilization and costs
- Warehouse geography – layout efficiency and the actual utilization of space

In order to create an effective slotting plan, data deriving from these and other factors items must be considered when determining where they are to be placed within the warehouse in order to achieve an effective picking process.

In velocity based slotting plans, for example, warehouse professionals usually subscribe to a 20-80 approach in which the fastest-moving 20 percent of the SKUs are placed in the most accessible, “least expensive” locations – those closest to the shipping door or preferred consolidation points. The other 80 percent are assigned their bin, case or pallet locations in descending order of accessibility, and ascending order of cost-per pick.

The logic relates to their cumulative cost for storage, replenishment, movement in and out of the facility, pick time and travel – essentially their relative share of all of the costs involved in their storage and handling. The degradation occurs when the various warehousing influences change and the slotting plan does not.

Slotting plans often are generated on a spreadsheet and because these tend to be difficult to manipulate, they are modified only rarely if at all. Changes tend to be minor because of the costs and cumulative implications: one move necessitates another, and so on. In the case of the industrial distributor, the solution was sticking with the status quo.

ACCELLOS ONE SLOT: COMPUTER-ASSISTED SLOTTING

Computer assisted slotting software is now available to model initial warehouse slotting design and importantly, also to support periodic reviews and assessments of the slot plan to assure that the warehouse operates at peak effectiveness.

Accellos One Slot is a warehouse planning simulator comprising a suite of tools that allow distributors, manufacturers, retailers or third party logistics operators to design a new warehouse in as little as a few hours with engineered precision. In operating warehouses, it can dynamically slot and re-slot the facilities over time to optimize operations. The resulting improvements yield higher productivity, better utilization of available rack space and enhanced warehouse throughput. The multiple modules include:

- Rack Selector
- Dock Planner
- Warehouse Layout Designer
- Slot Master
- Benchmark
Accellos One Slot can be integrated with Accellos One software solutions for automated exchange of data, or it can be implemented as a standalone application to work with data from other software solutions databases and ERP platforms. The software allows managers to model their warehouse under multiple scenarios as often as they wish to arrive at optimum layouts and maintain them as conditions and requirements change. It provides comprehensive costing for each simulation so that users can gauge the economics of retaining or modifying their slot plans.

THE MODULES

The Rack Selector module presents the user with a menu of the available types of racking from which selections are recommended based on the type of product to be stored and the physical characteristics of the facility. It also allows for consideration of customer racking options.

The Dock Planner performs a similar function, but works with data from the warehouse design and picking requirements to recommend optimum dock and door layouts under different picking scenarios.

The Warehouse Layout Designer allows the user to graphically represent the warehouse facility and to model it on-screen under an infinite array of potential designs, including bays, docks and doors; marshalling areas for shipping and receiving; office and secure or restricted spaces; positioning of beams and uprights; storage media selections; size details; and the relative cost per space, whether a for a one-foot case or a pallet.

The end product is a graphical representation of a warehouse comprised of single or multiple chambers, each comprised of multiple aisles, with various types and levels of racking, and more. The layout tool is virtually unlimited in its what-if flexibility, enabling the user to generate alternative simulations in seconds. When satisfied with the design, the user uploads it to the Slot Master module.

The Slot Master module allows the user to import inventory data and to integrate it with the warehouse layout design, taking into consideration all of the factors and characteristics relating to each stored product. Using this data, it generates slotting scenarios based on variables ranging from the product's movement in and out of the warehouse, its replenishment requirements, size and weight, fragility and crushability, stackability, regulatory considerations or any other criteria designated by the user.

The Benchmark module allows users to establish standard criteria for cost and management elements of the warehousing activity and use them in comparisons against Slot Master recommendations under different simulations.

MODELING SLOTS

Accellos One Slot can model slot profiles by SKU characteristics, order profiles, product families, forced zones and even forecasted activities. It supports every foreseeable warehousing variable, assigning slots by user-selectable prioritized criteria such as:
• Zone picking
• Velocity
• Product families
• Product characteristics
• Product dimensions
• Rack and bin capabilities
• Slot capacity
• Seasonality
• Location and Center of gravity models
• Multiple pick sequencing
• Fulfillment speed
• Custom Algorithms

These variables can be applied singly or in combination to create slotting solutions based on center of gravity analysis, including dock doors and multiple preferred locations, with choices including:

• Heuristic modeling
• Linear sort sequence
• Proximity to head of aisle
• ABC slotting

SPECIAL FEATURES

Zone balancing: Conventional wisdom calls for the fastest moving 20 percent of the product to be placed closest to the center of gravity – usually shipping doors. With 80 per cent of labor focused on picking from the same bin locations, serious problems can emerge, with one picker very busy while others are stalled. For flow-rack users, Accellos One Slot allows the fast-moving 20 percent to be dispersed among multiple zone positions, broadening picker access across the flow racks, accelerating work flow and maximizing labor productivity.
**Slotting by Family:** Certain product types (e.g. pet supplies) may share general characteristics but differ substantially in others, such as shape, volume or application (e.g. food, toys, gear). Accellos One Slot allows the products to remain in high velocity pick areas but in separated zones, with slotting optimized to their individual product characteristics.

**Slot optimization:** A slot optimization wizard also allows users to lock or select SKUs or locations to eliminate or include in pick runs. This feature is value when slotting new or seasonal product into the warehouse.

**Cube utilization:** Once the slotting plan is in place, Slot Master can produce location and utilization statistics. It also enables user to maximize the storage density in the warehouse by providing measurable statistics that transfer directly to application of the physical space.

**Bay profiler:** Slot Master’s profiler tool determines the best size of each bay, slot, shelf or bed by SKU. It also provides quick calculations to determine the total number of bays, shelves or beds that are required for a specific data set.

**Accommodating complications:** Accellos One Slot allows users to set up slotting algorithms that preclude pickers from performing faulty picks, such as:

- Toxicity: don’t mix with products that can be affected; perhaps set separate pick runs
- Crushability: Pick at the end of the run, not the beginning
- Heavier items: Pick at the beginning of the run so lighter items are on top

**MODELING PICK PATHS**

Users can button-select the type of pick path they want to use in moving from bay to bay: Sawtooth, Z, U, or Serpentine path. Then, using the graphical representation of their warehouse chamber or aisle design, they can define the vertical component of a multi-level pick path.

The graphical Vertical Bay Pick Profiler offers several options and once generated, the profiles can be saved and applied to individual bays or aisles. Profiler capabilities include:

- Support for multi-level picking
- Multi-level and multi section bay presentations
- User definable pick slot paths and shelf sizes
- Color-coded velocity levels: Green = Fast; Gold = Medium; Red = Slow
ROI CONSIDERATIONS

Slot Master incorporates a comparison chart in which users can input data on their existing costs per SKU, product family or other criteria and compare them with costs under various simulation scenarios. In this way, it is easy to arrive at the costs to move the goods. Labor is the dominant cost factor in virtually any warehousing operation, with travel costs alone representing more than half of the labor costs in unit case pick operations.

If by simply organizing products more effectively, picker travel can be reduced by 20 percent, an operation would be able to improve labor effectiveness by five-seven percent, representing:

- $45,000 to $65,000 in annual labor improvement for a 15-worker warehouse
- Improved service level (effective cost and time to pick an order line)

It becomes apparent that an investment in a slotting solution like Accellos One Slot can achieve a return on investment measured in as little as a few weeks.

WHO CAN BENEFIT FROM ACCELLOS ONE SLOT?

When contemplating a new facility, use of a sophisticated computer-assisted slot plan simulator like Accellos One Slot should be a priority. It’s faster, easier and more precise than the typical spreadsheet approach. With optimized slotting, orders get out faster; cycle time drops dramatically and the scalability of the business improves, since more can be accomplished with the same amount of space and smaller staff.

In existing facilities, Accellos One Slot can identify slotting pitfalls and recommend and demonstrate concrete ways to halt efficiency degradation, with alternatives that can yield immediate improvement. Existing slotting plans can be reviewed quickly, in whole or in part, easily and frequently, with automatic costing of new recommendations. If the user opts not to make changes, the costs of the status quo are also on display.

ABOUT ACCELLOS

Accellos is a global provider of logistics, warehouse, 3PL, transportation and mobile fleet management solutions. Accellos addresses the supply chain management and execution market with warehouse management systems for multiple environments; Microsoft Windows-based transportation management solutions; and in-field mobile resource management solutions. Accellos’ powerful supply-chain execution solutions are easy to customize and implement, providing our customers with more innovation for less investment while producing significant savings and greater profitability. Through a culture of innovation, Accellos strikes the perfect balance of customer satisfaction, employee fulfillment and shareholder value, delivering greater profitability and rapid return on investment for our customers and accelerated logistics and warehousing services for the clients they serve.

For more information, email info@accellos.com or visit www.accellos.com.