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Dynamic Slotting can Drive Huge Productivity Gains – but Few Companies Our Using the Approach Today

Retailer Canadian Tire Has Been Used Dynamic Slotting Approach Since 1989, saving Millions per Year; Computing Power Should Make it Much Easier Today, but Few Are Trying

SCDigest Editorial Staff

Pick face slotting optimization software has the potential to significantly enhance picking productivity, but for a variety of reasons the category has never reached the level of adoption many expected – though that is starting to change (See **Is Slotting Optimization Ready for Prime Time?**).

Tony Tyler, president of Ef3 Systems, says the key to really driving productivity through slotting optimization is to make the slotting dynamic, based on expected orders. This was the approach Tyler devised all the way back in 1990 when working on the warehouse system for Canadian Tire's famous 1.2 million square foot A.J. Billes Distribution Center north of Toronto (named after one of two brothers who founded the retail chain). Nearly 20 years later, it remains one of the most advanced examples of slotting optimization of any distribution operation.

"Slotting choices should be performed dynamically rather than as a batch process," Tyler says. "To do this, you need to place the picks by product in one or more "look ahead" scheduled cycles or waves, usually to match the transportation schedule and transit times."

The idea works like this: pick waves are pre-built to service the day's demand and considering factors such as carrier schedules, store delivery appointments (for retailers) and other requirements and constraints.

In Canadian Tire's case, the waves were designed to be short – as little as just 20 minutes each – and the operation was supported by a large amount of automation. But the concept can work in many other less automated scenarios.

The Warehouse Management System or slotting

Another critical element to the Tyler/Canadian Tire approach is that pick locations, such as traditional case pick from pallet rack, are always picked to zero. With that design in mind, a new pick position for each SKU that the system knows will go to zero is created and filled 1-2 waves before the wave that the system knows will require more picks of that SKU.
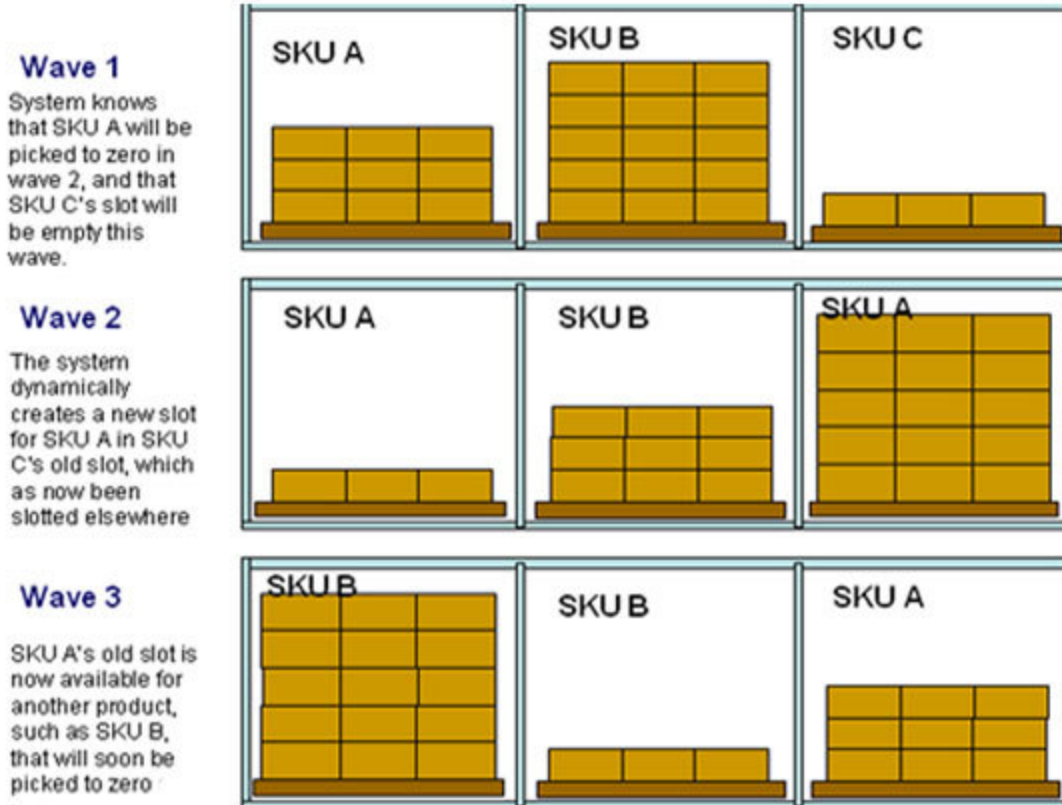
package will have access to those planned pick waves, as well as the inventory records. Therefore, the system can know the demand for a given SKU as far out as a company wishes for the day – and that foresight winds up being the key to making dynamic slotting work.

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"Do not place a replenishment in the same slot but determine how long (number of waves) it has taken to empty the pallet or case rack and then adjust the position within a prioritized and commoditized slot list for that product according to its priority and handling characteristics," Tyler added.

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Simplified Dynamic Slotting Example

Wave 1

System knows that SKU A will be picked to zero in wave 2, and that SKU C's slot will be empty this wave.

Wave 2

The system dynamically creates a new slot for SKU A in SKU C's old slot, which as now been slotted elsewhere

Wave 3

SKU A's old slot is now available for another product, such as SKU B, that will soon be picked to zero

Source: Supply Chain Digest

"Select an empty slot according to the latest determined position in the list and direct the replenishment to that slot one cycle ahead of when it will be needed."

It is even possible during the course of a single shift that a product with high demand early in the morning could be placed in a floor level "rapid pick location" and later move into "B" level slot as a pallet in standard racking. In Canadian Tires' case, for example, it might have a product that is on promotion in some stores but not others – so the slotting would change even within hours depending on what stores were being "waved."

Over time, a product can cycle through a number of different velocity zones, storage modes and pick methods.

"The key is the ability to look ahead across cycles or waves," Tyler added. "The computer power and computer storage costs to do this today are very cheap. It was more expensive back in 1989 when we first planned this, but still led to significant productivity gains.

Not Much Additional Physical Storage

Distribution managers that first hear the approach often assume it will mean a large number of pick positions will be needed – perhaps as many as twice the number of SKUs, as a position will be needed for the current picks/waves, and another as it is being emptied, for the next position.

Not so. Tyler estimates that only about 10% extra posi-

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tions will be needed in most cases. The reason: only about that number or less of the total SKUs will actually be picked to zero in a given wave. SKUs that could consume more than a full pallet in a wave are slotted in rapid pick areas that might gold many pallets.

In fact, storage efficiencies can actually be gained. Because not all SKUs, especially B and C level items, need to have any permanent pick face, and are simply given dynamic slots based on requirements.

Tyler acknowledges that it takes quite bit of "algorithmic" work to get the slotting rules developed, and that at the time of the original Canadian Tire implementation it involved quite a bit of custom developed software.

It may still will require custom software, but given the advances in computing power and application development, such a system could be built for a lot less today – and likely have a very high ROI.

"The labor savings in terms of reduced travel time and picker productivity are substantial," he said, estimating that Canadian Tire's savings are in the millions of dollars per year. Such a system can also eliminate the need for cycle counting in the pick areas altogether, since the locations are picked to zero and confirmed. To maintain very high levels of accuracy, pickers can be incented to inform supervisors if there appears to be a inventory error, such as being told the slot should be picked to zero on a pick, and there are still cases left.

"Using RF bar code readers, the picker and the WMS control system are in continuous communication so corrections to picking due to incorrect receiving counts can be inserted at a point in the pick cycle beyond the pick which uncovered the shortage," Tyler added.