

Package systems help control your costs

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On-demand cartons

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On our Lean journey throughout the operation we often hit a road block at one of the last operation steps: the packaging. In general, the corrugated-carton packaging suppliers are pushing for big batches with their multi-tiered pricing. These order quantities, often in the hundreds, are based on the supplier's technology and the supplier's economical batch sizes. This may work for an RTA furniture manufacturer with a narrow product line and batch sizes also in the hundreds, but not so well for others. Let's consider the manufacturer that has requirements for a wide range of box sizes, including neutral boxes (brown boxes) and a good portion of product customization.



ABC analysis

Analyzing the consumption profile, one will most likely find that 15 percent of SKUs represent 75 percent of the consumption volume (A items); 25 percent of SKUs represent 20 percent of the consumption volume (B items) and 60 percent of SKUs represent five percent of the consumption volume (C items).

Let's assume a consumption of 1,000 boxes per week and the average minimum order quantity is 300 boxes per SKU. We also assume we maintain a stock level equal to one times the minimum order. This would calculate as follows: A items, 0.4 weeks of supply (125 inventory turns); B items, 1.5 weeks of supply (33 inventory turns); C items, six weeks of supply (eight inventory turns). These are relatively optimistic numbers. The C items will range from 12 turns to less than 0.5 turns per year. This shows that 60 percent of the stock space is used by slow moving stock. If you add some obsolete, "maybe-we-will-use-it-some-day" stock, leftovers and partially used skids, the real number is probably significantly higher.

Solution XYZ

These numbers indicate a need more mass customization, higher product variety and shorter lead times. The current solutions of more inventory in stock, more supplier-held inventory and cutting down manually from the next larger size are not real solutions anymore.

New equipment in on-demand box making got my attention at last year's Ligna in Germany. Seeing a different machine in operation here in Canada got me even more enthusiastic. It was like finding the missing part for a puzzle.

The equipment uses a selection of different widths of fan-fold material, which is basically an endless strip of folded corrugated cardboard. The required box type and size is entered into the controller and the machine selects the best-fitting raw strip and cuts the requested box in all the details. When this machine is placed in line with packaging, the box can be produced less than one minute after demand is defined.

Integrated software is available that will calculate the packaging sequence, calculate filler pieces, minimize the required box and communicate directly with your production equipment. It is a great solution, of interest both to production specialists and engineers.

The next question is about the cost. Well, if we compare the purchase cost per box and compare that direct cost to the purchase cost of the make-to-demand box, the latter can be up to double the price. In my opinion, the project must not stop right here, as the mere comparison of the purchase price is not fair and not correct.

In order to compare fairly, we need to look at a bigger portion of the supply chain, including the cost and effort of demand management and individual box ordering; receiving, storing, and issuing small quantities to the pack line; managing leftover quantities; the investment cost versus the inventory value; shrinkage (old, dirty and lost boxes); storage space; obsolescence (product changes, errors in ordering); and additional fillers to reduce oversize boxes. Compare all this to managing a few fan-fold sizes in a Kanban buffer. This gives you a long list of real direct and indirect cost savings.

Time to give packaging some thought

A practical problem is that no company has sufficient data on the full packaging cost of its product. Another systematic problem is that, in packaging, there is often no clear responsibility. Production has its issues, purchasing pushes for its priorities, marketing's focus is different again, and product development might not include the packaging at all. When a subject of perceived low priority that overlaps so many areas requires changes, makeshift quick fixes are often the result. With nobody having the mandate to provide a strategic, sound solution, the status quo in packaging in many operations can be the result of years of these kinds of solutions. On the upside, the longer a subject has been unattended, the higher the potential for improvement.

There are also a number of secondary benefits. Imagine having professional-looking packaging all the time. We have all seen custom sizes packaged by using the "closest available fit." Using lots of labour to tape the box does not create a professional look and is always suspicious to the critical customer. Also, by making each box one at a time, the boxes can be designed more elaborately. Reinforcements can be placed where needed. Crash zones built by specially folded ends are relatively easy to add, and also cut down on shipping and handling charges. The flexible CNC technology allows for the creation of fold-up, self-locking boxes that can reduce packing and unpacking time in. Finally, supplying just-in-time and having practically no inventory removes that "drag anchor" on innovation. Small and incremental improvements can be implemented on-the-fly without waiting for the inventory to deplete and without the headache of revision control. This technology can take you in the right direction. However, each company needs to be clear on the implications for its operation and the return on investment. Luckily, custom packaging is not necessarily an all-or-nothing project. There are creative ways to integrate the technology into your process where it is needed most.

As with almost all Lean projects, this cannot be approached as plug-and-play. All box making must be integrated into an overall Lean approach in order to truly bring you closer to Lean operation.