

“How to effectively manage small order quantities”

Retailers want to create a new shopping experience for customers, more frequently than ever. They offer a new look and feel, and change the merchandise multiple times during a season. These specialty retailers work on leaner inventories to achieve this. To the supply chain, it is transferred as small order quantities within faster lead time, or ‘speed to market’.

The ever changing consumer proposition has driven the global retailers to keep innovating the product offering on the shelves. Consumer is perpetually looking for value for money. Most retailers positioned in the mid market segment or value segment have done well and will continue to do so. Fast fashion is almost the buzz word season on season. While, the fast fashion ensures a greater foot falls to the stores, it puts additional pressures to the manufacturers. The order quantities per style have gone down drastically over the last couple of years. To add to this, the lead times have also gone down. The supplier is now required to produce smaller order quantities in even smaller lead times. So how does one manage this complexity?

Our typical mind sets have forced us to think that more the work in process – higher the output. We have also always thought that longer lines will give higher output, and now with the changed product mix, some of these mind sets will have to change completely. Smaller order quantities of say 2000-2500 pieces per style cannot be made on longer lines of 50-60 machines running on the progressive bundle unit. Even on a bundle size of 20 pcs, it will force the line to build in a work in process of around 2000 pieces (considering 2 bundles per work station). This would mean that almost the entire style gets loaded on to the line even before getting any substantial output. Now if maybe the fourth operation has a quality issue, almost 65% of pieces will be done before the problem is caught. This makes the overall proposition unworkable.

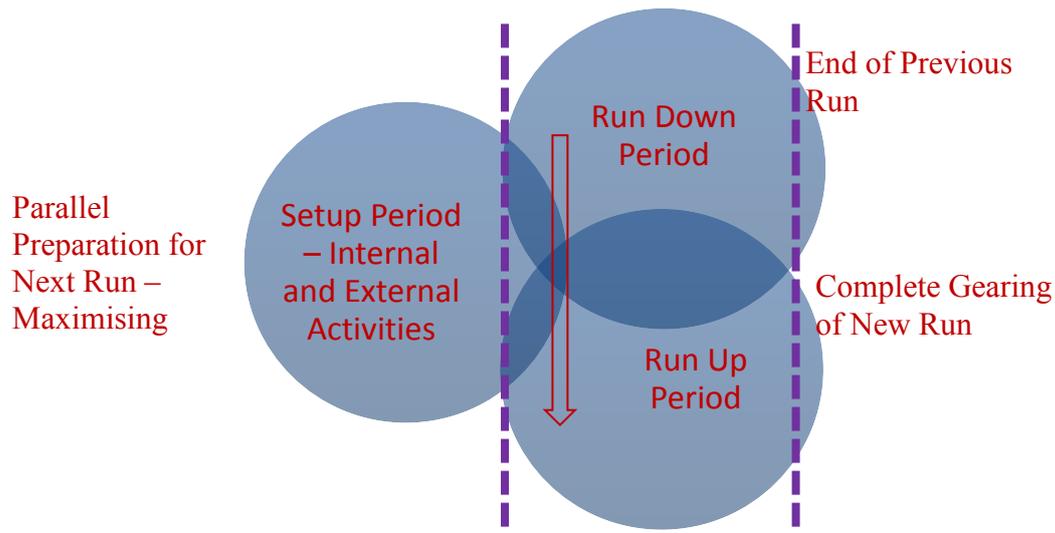
In another case if say the seventh operation is a critical operation and takes two days to set then the people ahead of the line will virtually sit idle and time lines go for a toss. It will then be on the third or the fourth day that additional operators are deployed or the same operators are then employed for longer hours to make any significant number of pieces so that the people ahead can be occupied. This increases costs may folds than what was planned. The style was supposed to finish in 3 days and it can now take 6 days. Three additional man days gone wasted could potentially disturb the month’s production thereafter.

Smaller quantities need to be managed completely differently. The response times to address the issues need to be very high. The basic process starts with the preparation of the style. The pre production processes should clearly define on how individual operations will be planned and executed from cutting to finishing. Sewing lines need to be defined smaller and processes need to be as lean as possible. On a single or a near single piece flow (say a 5 pc bundle) the response time on the process quality has to be fast. The operators should be motivated enough and trained to inspect their own work. Any non conformities need to highlighted faster.

Two key approaches to ensure ‘agility’ and ‘efficiency’ in small orders can be:

1. Single Minutes Exchange of dies (SMED) is a tool to ensure faster turnaround on the styles.
 2. Pull Systems to minimize waiting time and inventory
1. **SMED or Quick Changeover** aims at optimizing the production losses caused due to style changeovers. Changeover is the process of converting a line or machine from producing one product to another. This leads to a lot of time spent in an activity that actually has no end usage, and eats up a lot of time that is meant for production. To reduce the changeover time, sequential processes need to be converted into parallel processes. The activities that can be moved out of the line should be moved out for external setup, and can be plugged back subsequently. Within mandatory internal setups, activities can be scheduled or pre-planned in a manner that the speed of process changeover is maximized (instead of experimenting with real time hits and misses).

In the garmenting setup, SMED can prove to be a very effective tool during style changes. During this process, a lot of time goes to waste to set up and arrange the desired machinery. In many cases, even a simple thing like adjustment of machine tension is arrived at after a lot of time spent in trials. There are instances of substantial changeover activities even when the product type is same, but there are little variations like gathers, pleats etc. The situation is worse in case of units handling small orders, involving short cycles and frequent style changes. SMED approach can be depicted as below:



2. **Pull Systems:** Pull System is an approach to plan work in a way that every process produces only as much as the next process needs, just when it needs, and only in as much quantities as it needs. Obviously, this aims at reduced inventory within highly responsive process design to delivers 'quick response' to customer's demand, whether internal or external.

This pull will be across departments, where one department will produce the required goods only as per the requirement of the next department.

A perfect flow system would be a zero-inventory system. But when pure flow is not possible, because the processes are spaced at a distance or when the cycle times to perform each operation varies a great deal, as it often is in the garment industry, the next best choice is in process **Kanban**. Kanban becomes an enabler when we are unable to create a one piece flow of the pieces in the factory, leading to a controlled compromise. So, it brings us to the next best thing - a pull system with defined inventory. This leads us to the concept of a "**Supermarket**".

In any supermarket, whenever a product is picked by the customer, it is simultaneously replenished by the supermarket personnel. The personnel is not simply pushing inventory onto the shelf, nor is ordering anything from the suppliers, but just replenishing the products as and when required by the customer, so that it doesn't dry out. The processes are scheduled in a manner that it is the process replenishing the product instead of personnel. This also requires careful leveling and Kanban space planning to keep required checks and balances, and a visual tool to accentuate 'pull'. Thus, a supermarket is created between any two connected processes, where one process needs goods from the previous stage but it cannot align itself to the previous one on a just in time basis, and therefore warrants some buffers or inventory.

Pull Systems and SMED are the classic lean tools to build a robust system for small orders, as also for a quick response process design aimed at delivering speed to market, whether for first orders, or order replenishments. Together, they build up a highly responsive Just in Time system that supports low inventory agile manufacturing. There cannot be a better way to manage small orders efficiently, responsibly and profitably.

Authored By:

Amit Gugnani - Senior Vice President, Fashion (Textile & Apparel)