

LEA E-LETTER
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Dear Lean Community Member

We have recently visited several food and pharmaceutical manufacturers as they get started on their lean journeys. One of the most challenging was a huge plant making the base ingredients for the pills we buy in our local pharmacy or supermarket. It looks like a cross between an oil refinery and a brewery.

This plant makes hundreds of different products, each of which goes through a dozen or so processing operations, taking about 15 months from start to finish. These base chemicals are then shipped to another plant to be turned into pills, from which they pass through several warehousing steps before reaching the point of sale. I was staggered to discover that it takes almost twice as long to make a pill as the 319 days it took to make the famous soft drink can in *Lean Thinking!*

Not only was there no flow, but quite obviously there was also no pull or levelling either. Indeed we were told that production schedules in both plants change all the time and that fire-fighting is endemic. Like many firms they have pursued lots of initiatives and IT fixes to try to improve their forecasts and schedules, but have little to show for them. This suggests to me they are addressing the symptoms and not the root cause of the problem, which lies in the logic on which their planning is based. The second hurdle to overcome is the strong belief that flow, pull and levelling are impossible dreams in a process industry.

The logic behind the way production is planned today is based on four key assumptions. First that customer demand is erratic and unpredictable. Second that therefore one needs to be "flexible" enough to make any product in any one of the many mixing tanks, fermentation vessels etc. Third that one will get "optimal use" from all these assets by scheduling large batches (or Economic Order Quantities - EOQ) through each operation in turn. And fourth that the data on which these plans are made is accurate enough to be relied upon. On closer inspection none of these assumptions turn out to be true.

The consumption of pills, and most food products for that matter, is actually quite steady and does not vary a lot. Most of the variation in orders received by plants is "created" by the way information is batched and passed upstream and by the delays in the many "just-in-case" warehouses on the way to the customer. This would suggest that levelling production in line with demand is both desirable and possible.

If this is the case then why let the tail wag the dog? Why mortgage the performance of the whole plant for the "flexibility" required for a

tiny fraction of production? Is it not more important to create a flow for high volume products so they can be produced in line with demand, rather than constantly recalculating the plan for every product based on EOQ?

It is also common to find that isolated pieces of equipment whose use is "optimised" using plans based on EOQ end up producing saleable product for a much smaller fraction of the time than equipment whose capability and availability has been improved so they can be linked to enable products to flow through them without interruption.

Finally people are beginning to realise that centralised control systems can never cope with the minute by minute disturbances that happen all the time on the ground. Events change faster than the plan, beginning a vicious circle of bad data feeding bad plans. Radio Frequency tags (RFID) on every product may help, but may also lead to data overload that turns out to be nightmarishly expensive to fix. Most firms do not know the level of data inaccuracy in their systems. In my experience when they take a look they get a nasty shock. This suggests they might be better off by creating rapid, reflexive replenishment loops all the way back from the customer, which pull rather than push products through production and distribution.

In our experience, once the fragility of these assumptions has been laid on the table it is possible to open people's minds to creating flow, pull and levelling. The place to start is by using a simple, but powerful tool developed by my colleague Ian Glenday, which we have come to call the "Glenday Sieve". By ranking the products (SKUs) by volume, it reveals how skewed the distribution is. It is very common to find that five percent of the product lines account for half the output of the plant. At the other end of the scale one third of the product lines account for less than one percent of output.

In fact almost every plant (hospital, office process, etc.) has at least two different types of flow that need to be planned and managed differently. In one case you know the high volume products you will produce every week, but not the precise volume. In the other case you probably know the overall capacity needed, but not which products will be required that week. Start by separating out the high volume products, before moving on to analyse what needs to be done to the remaining product lines in order for them to be able to join the flow.

One of the quickest ways to overcome the sceptics and demonstrate that flow and levelling are possible in a plant that has never experienced flow is by dedicating a set of equipment to produce the high volume products in a regular, fixed sequence. At least to start with. This can be done the following week. This will quickly reveal all the problems with the equipment itself and with the lack of

standard work. Provided management can keep its nerve as problems crop up and signal their intention to make flow happen, then the sceptics will come on board. The biggest surprise is that within weeks you can make a lot more products through this equipment than ever before. Now you have secured top management support.

As employees learn through repetition (and incorporate this into standard work), as equipment availability is improved and as change-over times are cut then you can step-by-step reduce batch sizes, add lower volume products, increase the frequency of the cycle and flex the volumes in each cycle in line with demand. Raw material deliveries for these products can be synchronised with production and planning becomes extremely simple, requiring no fire fighting.

In parallel there is a lot of work to be done to analyse whether the company needs the tail of low volume products and if so how to schedule these – on separate equipment, at a different time or by reserving some capacity for them in a mixed-model pull system. The end objective, which now begins to look possible through it may still be some way off, is to be able to make every product every cycle in line with demand (to Takt time) with levelled production. A realisable dream.

As lean thinkers we need to pay close attention to both the needs of the type of process we are dealing with, but also to the tactics that build management support to make it happen and the knowledge base that will sustain it over time. Circumstances will differ, and therefore the emphasis and sequence of actions will too, but the underlying logic and objectives are common.

I wish you a restful break before getting back to your lean journey in the New Year. Thank you for your interest and support in 2004.

Yours sincerely
Daniel T Jones
Chairman, Lean Enterprise Academy

PS. You can find more on using the “Glenday Sieve” in Ian Glenday’s article Moving to Flow on www.leanuk.org. You will also find details of two new LEA initiatives for the New Year. First the “What’s in Store” Strategy Workshop series for senior management from Food and FMCG suppliers, run in conjunction with the TPL MANDI Group. Second we are launching our first “Lean Club” for a limited number of firms to work through their lean transformations together, facilitated by LEA. Finally in the next month we will be announcing our next Lean Summit in the UK scheduled for early November 2005.