PREACTOR and LEAN

WHAT IS DEMAND DRIVEN LEAN AND WHY IS IT IMPORTANT TO MANUFACTURERS?

Lean manufacturing represents a cultural change at all levels of a company. Its prime objective is to eliminate waste, whatever form that takes. The most obvious examples in the production area might be excess materials in storage, work-in process, and finished products waiting for buyers, but it can also be any process that does not 'add value' to a finished item such as a setup, waiting in a queue or the unnecessary movement of materials and operators.
The ultimate objective of a manufacturer is to deliver orders on-time with minimum inventory within the shortest lead time while achieving the highest possible utilization of resources that are adding value. Most Lean initiatives start with a process called Value Stream Mapping which is merely a formal way of analyzing how we produce things and identifying tasks or areas where no value-add takes place. Once identified, processes can be redesigned to remove waste.
Lean thinking also uses techniques such as Heijunka and Kanban to level load demand and provide a simple, visual method of pulling materials in response to actual demand rather than pushing materials with MRP. Although manual Heijunka and Kanban can be central to Lean initiatives, in reality, they are just one step along the road to the ultimate Lean objective which is to more efficiently service customer needs. This is what we call Demand Driven Lean.

Why is this? The ultimate test of how Lean you are is to ask the question has your Lean initiative actually improved your efficiencies and the way you service your customers. Have you improved on-time delivery performance, increased turns of finished goods inventory and reduced actual lead times?

WHAT ROLE DOES PREACTOR PLAY IN A DEMAND DRIVEN LEAN WORLD?

Preactor is the tool that enables manufacturers to transform their Lean initiatives into the world of Demand Driven Lean.
* automates Heijunka scheduling to level load production
* synchronizes the flow of materials
* synchronizes the flow of sub parts coming from upstream work cells
* minimizes changeover times and cycle times at upstream work cells
* eliminates non value added activities needed just to maintain ERP
* extends Visual Control Systems to provide company-wide visibility
* improves operational decisions by simulating the consequences of what-if alternatives

Lean streamlines processes to eliminate waste and Preactor tightly connects activities and decisions to reflect fluctuating customer demand. The Preactor Demand Driven Lean solution is designed to improve on-time delivery performance, while reducing actual lead times and inventory levels.
Lean needs a tool like Preactor to get to Demand Driven Lean.

PREACTOR AT TOYOTA

TPS or Toyota Production System is world renowned in manufacturing as being at the pinnacle of best practice in production control. Many of the Lean principles that are used today were developed and pioneered by Toyota. TPS strives for the absolute elimination of waste, overburden and unevenness in all areas to allow members to work smoothly and efficiently. The foundations of TPS are built on standardization to ensure a safe method of operation and a consistent approach to quality. Toyota members seek to continually improve their standard processes and procedures in order to ensure maximum quality, improve efficiency and eliminate waste.
In an automotive assembly plant component parts are made available to the assembly line from small Kanban controlled WIP stores. To balance the assembly line the product mix, sequence and repetitive period is typically pre-defined each month (such as 10 Type A, 10 Type B, 10 Type A, 10 Type B, repeating every day). Each WIP store will contain a number of 'Kanbans' or 'totes' of the components and each time one tote is removed from the store a Kanban signal is sent to the component production cell as an 'order' to replenish the store. The minimum production quantity is one tote full.
In a perfect world the component cells would simply make one tote full of each item whenever a Kanban signal arrives, but the world is far from perfect and the component cell may have to develop a schedule that is very different to that of the main assembly line.
For example, the dashboard injection molding cell at Toyota's UK plant cannot make all the components one tote at a time because the number of setups required means that they would not have enough capacity to meet their demand. They have to make larger batches, but at the same time they must keep the WIP stores between their minimum and maximum levels.
The problem is further complicated by the fact that the component cell works three shifts to achieve the required capacity whereas the main assembly line works two shifts. Calculating a feasible sequence of component production to match the demand, given the parameters of the demand pattern, tote size, minimum and maximum store levels, production rates, setup times and shift patterns is known as Heijunka (load-leveling). This is a non-trivial calculation that must be carried out every time the assembly mix, quantity or sequence varies.
A Preactor Advanced Planning and Scheduling system with a "Heijunka" scheduling rule is being piloted by Toyota to calculate the component sequences and batch sizes, and has dramatically reduced the time required to perform the calculations.
Many Lean manufacturers would see the level monthly demand typically achieved by the automotive sector as unobtainable, and the more variable the demand, the more Heijunka scheduling is required to assist the Kanban production control.
Finally, if we extend the concept of Heijunka scheduling across more component cells and the final assembly areas of our Lean factory we can achieve visibility of the effects of the variable demand leading to better decision making about priorities, delivery performance, resourcing levels, etc.