



Lean Enterprise Academy

LEA e-letter – 8 April 2008

Unscrambling Supply Chains

Dear Lean Community Member

The other day I was with a group of senior executives puzzling over an end-to-end value stream map. In this case it happened to be for an automotive component, stretching from raw materials to the car assembly line, but it could equally have been for many other products, such as medical devices supplied into a hospital. Surprisingly this was the first time these executives had looked at all the end-to-end flows involved in making this product. They were shocked at what it revealed.

It apparently takes between 26 and 97 weeks – or between six months and nearly two years - to perform a total of 156 production steps in 21 plants spread across four continents. We estimated that it took no more than 200 minutes – or just under three and half hours - to carry out these forging, machining and assembly steps. Moreover these parts travel literally tens of thousands of miles across the globe before the final six assembly steps are performed close to the final customer, in this case in the USA.

Calculating the total inventory cost in this long pipeline is a dramatic wake up call. But this is just the tip of the iceberg of unnecessary costs in this supply chain. Does it really need to take nearly two years to perform three and a half hours of value creating work? While these senior executives may have been shocked, this situation is unfortunately very common. What is surprising is that they and many other automotive suppliers have gone so far in the wrong direction in recent years, despite starting to introduce lean inside their plants more than a decade ago.

So, they asked, how did we get into this mess? What does this reveal about the thinking behind the way we manage our supply chains?

Eleven of the 21 plants are owned by this supplier and each of them specialises in a different set of activities, performed on many different parts for different customers across the globe. These are the traditional "focused factories" popular before the rise of lean and still being peddled by some consultants - shame on them. The thinking behind this is to concentrate skills and machines in fewer locations in order to benefit from economies of scale (bigger and faster machines) and to improve asset utilisation.

However their experience of this focused factory thinking, like that of many others, is quite the opposite - a more complex product mix in each plant results in lower rather than higher OEEs and asset utilisation than before – as well as lots of additional costs throughout the much longer supply chain.



Lean Enterprise Academy

LEA e-letter – 8 April 2008

Like many others this supplier tried to address this problem by buying an SAP ERP scheduling system to plan each production step and each shipment. This not only caused the usual chaos when it was introduced, but it did not get rid of all the short term plan changes to the schedule and the resulting fire-fighting, indeed both of these seem to have got worse, as did their OEEs.

In the face of relentless price pressure from their customers this supplier, again like many others, moved a lot of its production to low wage locations in Brazil and China. In private these executives described going to China in retrospect as "a disaster". Cheap direct labour costs were more than offset by a whole host of unforeseen additional costs.

The lean alternative is to try to co-locate as many production steps as possible for each product family in one location (either close to the customer or at a lower cost location in trucking distance within the region), using right sized equipment to flow the right products quickly through each step as triggered by Kanban pull signals from the customer. This simplifies the planning and scheduling process at the same time as compressing the total lean time through the supply chain.

But focused factories, ERP systems and low wage sourcing are actually symptoms of an underlying management system. Unless the mental models behind this management system are challenged these mistakes will be repeated time and time again and lean initiatives will never get off the ground.

Traditional management focuses on the vertical organisation of work, careers, technologies and budgets in plants and in departments. No one sees or is responsible for the horizontal flow of value across the entire organisation to the customer for each product family value stream.

So the first thing to do is put someone in charge of the end-to-end value streams for each product family. Their job is to articulate the needs of the process, to shout when departments are tempted to act on their own behalf rather than in the interests of the overall process, and to lead the action to streamline these value streams.

Traditional management also tells facilities and department heads to "make their numbers" during each reporting period, which is often easiest to do off-loading costs on up-stream and down-stream portions of the value stream. What is needed instead is agreement to use lean methods to streamline the flow and to make progress at each point visible to everyone involved.

Traditional management allocates resources and makes investment decisions based on these numbers. This effectively means they are flying

Lean Enterprise Academy



LEA e-letter – 8 April 2008

blind about the real situation and have no way to understand the total costs of different locations.

The whole point of a lean value stream is to discover exactly what resources are needed to flow products to customers quickly. This is the right basis on which to build a true cost of location model based on total costs and not just on factory gate costs plus slow freight. This in turn will reveal the huge potential from compressing value streams in time and distance.

The moral of this example is that it is not enough to think about better process design when thinking about supply chains of the future, but it is also necessary to challenge the mental models on which your management system is based.

Yours sincerely

Daniel T Jones

Chairman, Lean Enterprise Academy