Streamlining Your Manufacturing Supply Chain Using 5 Key Principles & Lean Tools

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Abstract
To streamline their supply chains companies must use both Lean tools and principles of Supply Chain Management. Each used separately will not accomplish meaningful and sustainable savings. These basic principles are enduring truisms that companies often forget in good times. Lean tools help to identify when the basic principles are not being adhered to and make the resulting loss of productivity visible.

Background
We recently worked with a Defense products manufacturer to identify and eliminate inefficiencies in their organization. Like many defense companies in the 2000's, economic times were good and sales were strong. However, bureaucracy and non-value added steps found their way into processes. The area that showed the greatest opportunity of improvement was the Supply Chain process. This encompassed manufacturing engineering material planning, production planning, purchasing and material estimating (for new proposals).

This white paper outlines the approach we took and the results we achieved.

5 Key Principles of Supply Chain Management
- Planner-Buyer: Combine planner and buyer responsibilities for order fulfillment
- Strategic Sourcing Buyers focus on constantly finding better cost suppliers and products
- Kanban: Use visual inventory management for consistent use parts
- Balance up front versus downstream costs to achieve the lowest total costs (the economic order quantity formula)
- Counting adds no value

The planner-buyer concept, first popularized about 30 years ago, combines planning and purchasing functions. The person who plans the order in production, plans the material usage and releases the purchase order to suppliers. They see the entire picture of material and production flow. They are the single point of contact and are responsible for getting the order and materials to the right place at the right time.

Strategic sourcing buyers work along-side planner-buyers. However, they don't have transactional buying responsibilities. Rather, we want them to be the material cost reduction experts of the company. Through old fashioned negotiation, working with suppliers or reverse internet auctions, their job is to constantly reduce costs. They can work with existing suppliers to gather cost ideas, find new products that reduce total costs or find new suppliers. Note that costs include supplier price, service and quality. The lowest price may be the highest cost.

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Kanban follows the saying from Einstein, “make things as simple as possible, but not too simple.” If a component is used continuously, keep things simple and maintain a two-bin kanban system that reorders when one bin is empty. However, if production items are used intermittently and/or are very expensive, these can be planned to arrive per the production schedule. MRP systems are a good decision support system, aiding the planner in creating this schedule. Kanban and MRP/planning are not all-or-nothing tools. Use each where appropriate to make your process easier and more effective.

Balancing up front effort with downstream costs can be thought of as the EOQ (economic order quantity) principle applied to every-day business. If a customer order is not very large it is often more cost-effective to be imperfect in your estimating/planning. If an order is very large and ongoing, however, highly accurate bills of material, drawings, material estimates and routers will be lower cost in the long run.

Too many companies count incoming components as a quality measure. In fact, a part can be counted 5+ times before it is used. The supplier is counting the part to make sure they are selling the right amount. Note: if through random audits you find they are not, this can be dealt with on a as needed basis, and a new supplier found. Many companies count when they receive the item. When the item is in stock, it is cycle counted. Then they count when they take it out of stock and bring it to production. Especially for low dollar items, just let the supplier count the part. Put it right on the production line in a kanban bin and focus on more important activities. On a side note, about half the time when counting at receiving you will find the supplier gave you more. Dealing with this return is almost always higher cost than the value of the product.

Lean Tool – Process Flow Mapping

Lean is a simpler and fast method to identify and eliminate non value added steps in processes. For a business process, such as Supply Chain Management, we use process flow mapping. Lean is not as concerned with designing a new process as eliminating non value added steps. The new process is simply the old process with the non value added steps taken out. Lean projects are completed in 4 weeks and have lasting improvement.

Current State Process Flow Mapping

The supply chain process we streamlined encompassed:

- Creating material estimates for new proposals
- Getting bids from suppliers to support the material estimates
- Material planning to create purchase orders for materials and components to support production
- Production planning to create work orders that drive production
- Manufacturing engineering who creates the detailed steps to produce a new product

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- Purchasing who negotiated and awarded contracts
- Operations

We created a process flow map, including all the detailed steps, decisions, paperwork and databases that are part of the supply chain process. The Mapping team included people from each department that touch the process including:

- Estimators
- Engineers
- Planners
- Buyers
- Operations supervisors

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Current State Sales Process Flow Map

The different colors represent the different departments that touch the supply chain process.

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What the Current State Process Flow Map Showed Us

There are 342 steps in the supply chain process. 76 were non value added and eliminated. 56 were non value added and simplified. Therefore about one-third of the steps were impacted by this project.

Examples of improvements include:

- Using the Pareto 80/20 principle to focus material estimating on the very few components that drive most of the cost of the final product
- Using the ERP system to generate reports that were done in Excel
- Combining overlapping databases in sales, estimating and planning
- Letting the Planner-Buyer do the material estimating, as they know the product the best and will have execute if we win the award
- Planner-buyers working together during material estimating to eliminate overlap after the winning the award

Below is a summary of hours saved per year by role. As you can see the reduction in work equaled about 22 people per year.

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Summary of Time Saved by Role

Sum of Total Time Saved	
Role	**Total**
Buyer	**7495**
Engineer	**2010**
Material Estimating Manager	**264**
Material Estimator	**5212**
Material Planner & Buyer	**3120**
Production & Material Planner	**16002**
Production Lead	**125**
Production Planner	**195**
Production Supervisor	**287**
Program Manager	**575**
Q/A	**230**
Warehouse	**10712**
Warehouse Admin	**188**
Grand Total	**46415**

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