

## Practicing Lean Manufacturing in Furniture & Upholstery Industry

### The Business Challenge

A few weeks ago I participated in a discussion in which different manufacturers were asked to define the term “Lean Manufacturing”. Not surprisingly, it was defined differently by different people, depending on their industry, role in the organization and geographic location. Some looked at it from an organizational point of view and defined it as “corporate and management culture” or “a system that best serves the customer”. Others defined the process as “a systematic approach to identifying and eliminating waste”, or “the art of mobilizing and pulling together the intellectual resources of all employees”. One even defined it as: “a ‘low-carb diet’ organization philosophy”.

While lean manufacturing is defined differently in theory, all definitions lead to the same practice: **getting the right things to the right place at the right time and in the right quantity, in order to achieve perfect work flow, while minimizing waste, being flexible and able to change**<sup>1</sup>.

How do we implement and practice this in our manufacturing plant? Can we reach all these goals, or does practicing lean in furniture & upholstery manufacturing force us to prefer one aspect, such as automation, over another aspect, such as flexibility?

### Practicing Lean Manufacturing

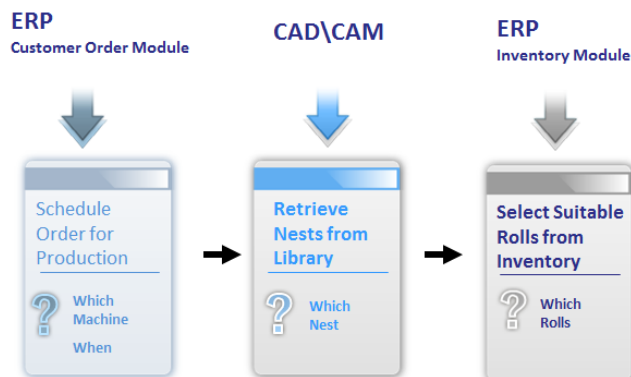
Production optimization software takes a holistic approach - looking at the process as a whole, addressing all the above goals simultaneously and making them all reachable.

### "Automation" - Smart Automation

Procedures and decisions that are not made automatically, not only result in extensive paperwork and human errors throughout the process, but are also made **sequentially**, where one decision limits the potential of the steps that follow, resulting in wasted resources and excess time spent; Automating the process must be smart and based on a solution that processes **all factors simultaneously**.

**Figure 1a** describes how in serial decision-step limits the potential of the steps that follow: scheduling the orders before the rolls results in retracting the same roll different orders, and leads to extra time and waste.

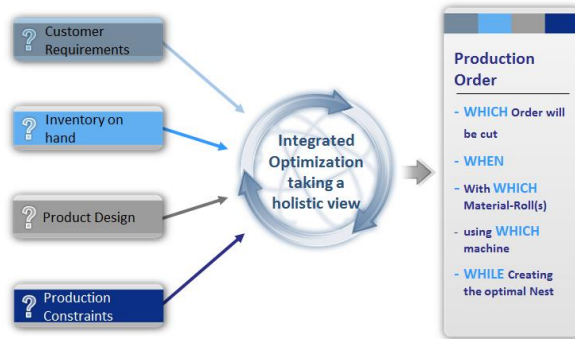
Figure 1a - A sequential process



making, one follow. For selecting twice for two material

<sup>1</sup> [http://en.wikipedia.org/wiki/Lean\\_manufacturing](http://en.wikipedia.org/wiki/Lean_manufacturing)

**Figure 1b** describes an automated solution that **simultaneously** processes all parameters and gap between the different units and functions in resulting in an optimal, automated production plan. orders mentioned in example 1a will now be one after the other on the same roll, for better utilization and optimized production process.

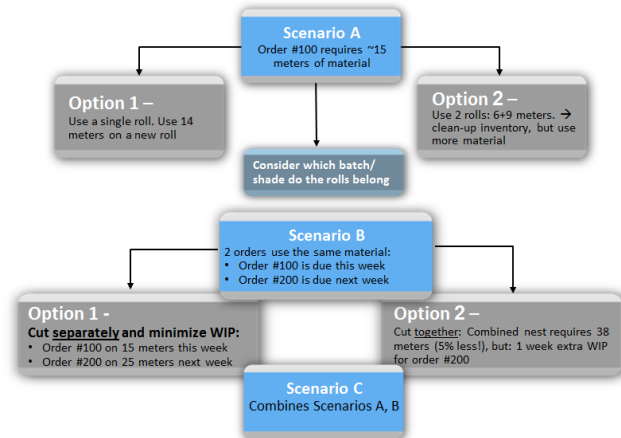


bridges the plant, The two scheduled resource

**Flexibility and deciding what matters**

Installing an automated system is not enough; the system must show real-time flexibility in different scenarios while following the company's policies constraints. To practice lean manufacturing, the system must balance optimization tradeoffs dynamically for each case based on the rules of the business.

**Figure 2** describes a set of scenarios that are weighted each time differently based on the order details, inventory details, company rules and manufacturing constraints.



**Waste Minimization**

Remnant rolls are a major source of waste given the challenge of using them methodically. Implementing a solution that will not only **use these remnants but create fewer remnants to begin with**, will contribute to the lean goals.

**Figure 3** demonstrates how a production optimization system practices remnant utilization; a given kit requires about 15 meters of material to be nested. Traditionally, each kit is nested to a single roll, leaving behind a growing stock of short rolls. Multi-roll nesting is dynamic & utilizes all rolls in stock, thus keeping short-roll inventory to a minimum.

**Figure 3 - Multi-roll nesting using the remnants from previous orders**

**Summary**

Practicing lean manufacturing is not deciding whether to focus on waste minimization or resource productivity. It is focusing on all those parameters and others, at the same time: increasing decreasing waste, and using empirical methods to decide what matters, rather than accepting pre-existing perceptions.

	Starting inventory	Lot #	Used rolls	Final inventory
Single-roll nesting	Roll A: 5.9 meters	A	---	A: 5.9 meters
	Roll B: 9.9 meters	A	---	B: 9.9 meters
	Roll C: 44.1 meters	B	C: 14.6 meters	C: 29.5 meters
TPO's Multi-roll nesting	Roll A: 5.9 meters	A	A: 5.9 meters	---
	Roll B: 9.9 meters	A	B: 9.3 meters	---
	Roll C: 44.1 meters	B	---	C: 44.1 meters

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about many efficiency,

Please stay tuned for our next paper. For more information please contact: [furniture@plataine.com](mailto:furniture@plataine.com)