

5. Lean Flow with Agility

The Lean philosophy of operations is undoubtedly the gold standard of our time. It has spread in Western business use from relatively narrow techniques (JIT, kanbans) to a comprehensive philosophy, and from a way to imitate or compete with the Toyota Production System to a system taught in virtually every industry. It is, for example, utilized now in warehousing and distribution operations.

Business environment of steady sales. One of the long-standing criticisms or concerns with Lean operations is that they clearly work best when they live in a fairly steady business environment: an environment in which product can be produced within a fairly narrow range of mixes and total volumes, a world where rate based planning works great because the rates do not change suddenly, a world where production leveling is practical, a world where customer orders pull product through the supply chain with little interruption or inventory. The argument has long been made that “business is not really like that; business is chaotic and we have to have processes that are focused on dealing with that chaos.”

There are a number of Lean defenses to that challenge. The first and perhaps most fundamental one is that most businesses are not truly chaotic. They tend to follow patterns, for example, highly regular seasonal sales variation of many products – we are going to sell more automobile replacement tires in September than July (in the Northern temperate zone of the earth, anyway). Some variation follows regular patterns that we could smooth out: a shocking number of businesses still pay the operational price of end of quarter sales “hockey sticks” because general management refuses to change incentive plans for the sales organization.

Seriously Lean enterprises, of course, go to considerable lengths to eliminate these known sources of flow variation. They promote their product counter seasonally; they eliminate accounting incentives for uneven behavior. Obviously these kinds of measures impact the entire enterprise – not just operations.

But no organization is able to eliminate all sources of variation: price changes, competitors’ activities, government regulation changes, new products. There will still be variation in flow. But much of that variation in flow can be planned for, right? And we can be both Lean and agile, can we not?

Pure pull means no planning? Now we get to the second issue. Some commentators consider a truly Lean environment to be one in which all goods flows are strictly “pull”, that is, in response to an end customer order. As we discuss in Chapter 5 of *Planning Product Flow*, we do not consider that to be very realistic. In most real world operating environments materials are moved to production locations, components are built, and production of

finished goods is planned based on expectations for a continuing flow of product – but without a customer order in hand. Certainly most of the automobile industry works that way. To be completely dependent on orders means to become un-lean, because it requires keeping substantial excess capacity around, or to forgo many sales (whenever business is good and order lead-time commitments get pushed out, customers simply go elsewhere). We believe that good mid-range planning is fundamental to making Lean work well. And good planning means that we can't be so very Lean that we eliminate all planning capability.

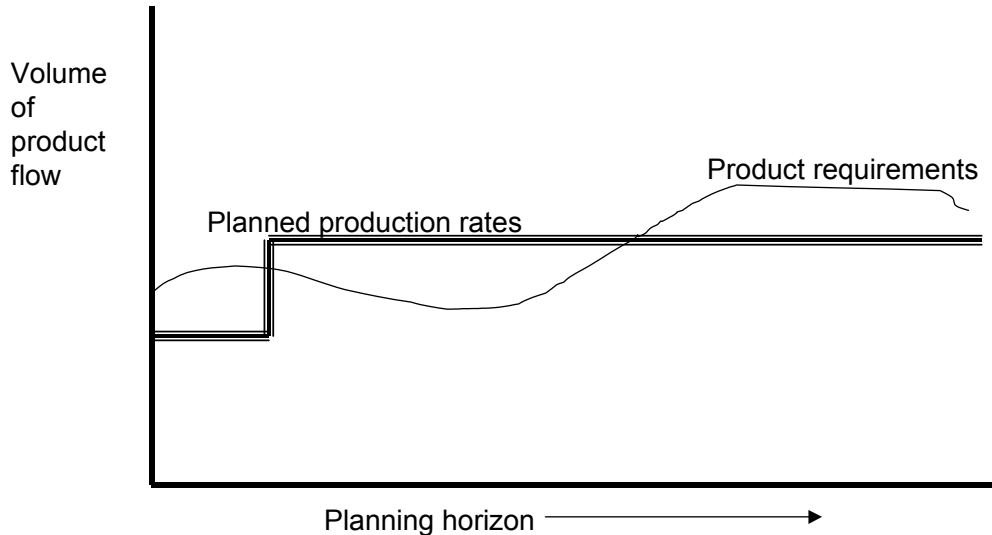
When I was a young consultant we worried that we would lose project work to internal staff, whose marginal cost (to conduct the next project) was of course lower than we outsiders'. As corporate internal staffs were reduced in the 1980's we noted that clients sometimes had little choice but to go outside if they wanted a project done, as there was limited internal capacity remaining. But we had not seen the limits of corporate thinning. By the 1990's we were noticing projects that we thought we had won being cancelled or deferred because there was not enough inside staff left to even direct the project! Organizations had reduced their ability to adapt to new business conditions by eliminating all of their "change" capacity. They had, in a sense, become less agile. The issue continues; we recently heard a client say "Don't bother to make any recommendations that would require any significant systems changes for the next two years. We are busy making a major ERP upgrade, and we have zero available IT staff time."

An analogous situation can exist in product flow planning, where a naïve attempt to eliminate planning can result in not having the planning resources to deal with changes in the business. To set up operations on the assumption that we will simply pull product through the supply chain as needed could mean giving up substantial agility -- unnecessarily.

Contrast this situation with the classic MRP II environment of two decades ago, where the planning process did not assume continuous operations. It did not assume any known bottleneck processes. Customer orders were taken or finished goods inventory replenishment orders generated, manufacturing orders were created and issued to the shop and material control, and good luck on when finished product would emerge from the plant. Huge "planning" resources were expended, largely on expediting.

Well-conceived implementations of Lean have, in contrast to both MRP and theoretical pure-pull environments, very effective medium range planning process and tools. As shown in the figure below, they typically go to great lengths to plan production rates that meet most customer requirements, and carefully plan transition from one rate to another, so as to not waste resources. Interestingly, this diagram looks only slightly different than it would in a conventional MRP environment; the biggest difference is that we rely much more critically on it in a Lean environment

Topic 5, Figure 1: Managing production rate changes



Of course, this vision of Lean risks generating unwanted inventory, and the Lean mid-range planning process must watch inventories like a hawk: finished goods inventories, and any level of component inventory that we choose to keep. It is a slippery slope down from the discipline represented by this kind of planning into a bog of unwanted inventory.

There is no attempt to schedule hour by hour flow in this environment; that task is left for kanban control, or other relatively automated flow controls. Nevertheless, because of the intense planning at the mid-range level (days and weeks into the future, depending on the type of business), this is in fact a highly planned operation. Because of that plan-full-ness, it is also a very agile operation. Every day the questions are asked:

- Is our plan for how much of each type of product we are going to move through the supply chain each (say) week for the next several weeks the best plan we can possibly have, given the orders on hand, our expected rate of sales, known seasonal variation, and our desire to not change flow rates.
- Are our material (or purchased finished goods if we are a distributor or retailer) flows each (again, say) week exactly the right ones to support that level of manufacturing or distribution?
- Is the mix of products sold changing perceptibly; do we need to make adjustments to reflect that?
- Is the geographic sales mix changing any; do we need to adjust the plan for that?

- Do we need any changes in our labor force, given this material flow plan?

Because of its readiness to change based on any environmental input, this planning stance represents an inherently agile approach and is solidly Lean, although not precisely Lean by some definitions.