

Can Lean Manufacturing Kill Your Job Shop?

A Tale of Two Companies

Joe Arvin

The presidents of two manufacturing companies were having a drink in the lobby before the start of their trade association's annual meeting. The first was Jim from BloatCo, and the other was Steve, who was with Slimline Corp.

As people in the same industry tend to do, they got to talking about their respective companies. Jim, the president of BloatCo went first.

"We're a job shop very similar to yours, and we supply a mix of commercial, high precision, and some aerospace. Most of our orders are small production runs. Right now we have a very large backlog, revenue is up, and we're very, very busy," Jim explained.

"Sounds like you're doing real well," Steve said.

"Well," Jim said as he looked down at his drink. "Not exactly - we've got some serious problems. We've got millions of dollars tied up in WIP inventory, and our CPA firm is all over my back on that. Our lead time is 20 weeks and getting longer, and we spend a lot of time on the phone breaking the bad news to unhappy customers about late deliveries. We're spending thousands of dollars each month on overtime and expedite charges."

Looking up from his drink, Jim asked, "So tell me Steve, since Slimline's very similar to BloatCo, are you having these kinds of problems?"

Quickly responding, Steve said, "Well, we used to have a lot of those problems, but then we introduced Lean Manufacturing and the Pull System. Over several months, we saw WIP inventory drop and our production schedules shortened so that orders had a clear path to shipping in just two months."

A bit envious, Jim asked Steve, "That sounds like what we need to do. I'm guessing that now you're really doing well."

Steve said, looking down at his drink, "Unfortunately no - now we've got some serious production problems hurting the bottom line."

Surprised, Jim asked, "It was my understanding that you were making a reasonable profit. What production problems are you having?"

Well, it can be any number of things that you just don't have any way to predict. Annually, 30% of our jobs are new, so frequently process changes are required mid-stream. Then there's tooling that's not ready, the wrong type of gauging, parts that need rework, and of course, there's unanticipated heat treat distortion. And I can't tell you how many times we have to stop a job while we're waiting for answers from a customer. The list goes on and on," Steve said.

Jim shrugged his shoulders and said, "So what's new? We have the same problems."

Continuing, Steve said, "What's happening now is that only 50% of our machines are running on a daily basis. Every time we run into a production problem that halts a job, there's nothing else to run - so we get empty machines and operators with nothing to do when we used to have some operators running two or even three machines. Our profits now are almost non-existent."

Finding the Middle Ground

BloatCo and Slimline are both experiencing problems that are not uncommon in the manufacturing job shop environment.

But you might be thinking, "Come on Joe, Lean and the Pull System is a PROVEN METHOD for streamlining any manufacturing operation. If you're not Lean, you're living in the Dark Ages. Get with the program Joe!"

First of all, it's important for this discussion to understand that a job shop is very different from one that manufactures a lot of repeat jobs in medium to high lot quantities. A high volume environment is really the sweet spot for Lean/Pull. However, a job shop, with a continuous variety of complicated parts with many operations, is where things can get tricky in terms of Lean/Pull.

Given that, something to consider is this. One thing I've learned in life is that

going to one extreme or the other will most likely cause problems.

On one hand, it is certainly true that having too much inventory on the shop floor is generally not a good thing, and typically lead times will expand, late deliveries will increase, while a lot of your money is tied up. On the other hand, if you've implemented a textbook version of Lean and your Work in Process (WIP) is trimmed to the bone, you might be missing some opportunities for increasing your bottom line. Let me explain.

There are two basic rules about manufacturing. Rule #1: Your best path to profitability is for your shop to be operating at maximum capacity — in other words — keeping the machines running. Rule #2: Problems will inevitably occur that will prevent your machines from running.

It's important to remember that a job shop using Lean/Pull are most certainly not immune from Rule #2 — problems will occur. And when things go wrong, not having work to shuffle around when needed will prevent you from complying with Rule #1 — keeping the machines running. This, in essence, can starve your shop and create some widespread problems. In contrast, in a shop that has some degree of extra WIP, when problems occur, there will be work on-hand that can be used to keep your machines running.

As much as we'd like to think that Lean/Pull's promise as the next evolution of manufacturing is something to fully embrace, the balancing act of production control in the job shop will likely be with us for quite some time until we can accurately predict everything that can go wrong.

There are other ways that having extra WIP on the job shop can benefit you — and actually make you a lot more money — thus dwarfing the relatively insignificant costs associated with excess WIP. For example, with additional work available, an operator can run more than



one machine. In doing this, these operations will, in essence, cost you virtually nothing.

Then there's the issue of machine change-over. Before tearing out a setup, including changing chucks, grinding wheels, coolant, or cutting tools, what if you looked around and found another job you could quickly run that would not require a major change-over. This can be a significant cost saver. In fact, I have seen a major machine set-up change take four hours which was used to run a 20 piece job. Then the machine was changed back for a 15 piece lot with a larger diameter, and then back again for a smaller diameter job. Had work choices been available, eight hours could have been saved on just one operation!

Heat treat presents similar time saving benefits. Let's say you have an eight piece lot ready for carburizing and required 14 hours of furnace time, yet the furnace can accommodate 60 parts. Think of the time savings if you had another job in the department with the same material and depth of case. By running these together, you've saved 14 hours on that second job. Without some additional WIP, you would have no opportunity for batching similar jobs and getting two for the price of one.

These are the type of on-the-spot decisions that a savvy manager can make, and in aggregate, have a serious impact on productivity, sometimes meaning the difference between profit and loss on a job.

Now you might be thinking, "Give me a break Joe—any good manager knows that your scheduling people should sequence the parts to take advantage of these time saving strategies."

As I mentioned earlier, in larger volume operations with repeat jobs, scheduling for these types of time saving strategies is much easier. However, in the job shop, with all the new jobs and differing delivery commitments, this gets very difficult to do unless you have an extremely sophisticated scheduling module—which most small to medium job shops don't have. But keep in mind, unforeseen problems will happen and this can derail even the most sophisticated scheduling module; therefore some additional inventory is essential.

The Tax Implications

Finally, in discussions about WIP inventory, one common concern involves its tax implications. To shed some light on this, I asked Greg Errandi (one of our CPA consultant associates) about the tax implications of WIP. Greg supplied this clarification.

Under the accrual method of accounting, GAAP (Generally Accepted Accounting Principles) requires matching of revenue and expenses. Manufacturing expenses are not expensed as they are incurred, but rather matched with the revenue they generate. Therefore, when WIP and finished goods are produced, all material, labor and overhead expenses

related to production are transferred to inventory (a balance sheet item) rather than expenses (an income statement item). As goods are actually sold, the manufacturing expenses associated with them are transferred to the P/L to match the timing of revenue with the expense.

In other words, any expenses associated with the production of goods not sold is not deductible for tax purposes. The accounting effect, is a simple transfer between balance sheet accounts—a decrease of cash and an increase in inventory value for material, direct labor (payroll) or assigned overhead costs.

So as far as taxes are concerned, don't be too quick to panic if there is a relatively reasonable amount of extra work on the shop floor.

Conclusion

When you look to Lean/Pull principles to improve your job shop environment, you should be careful about going too far to the extreme. Being buried in WIP inventory is generally something to avoid. However, having some extra inventory on the shop floor means flexibility. And flexibility is a valuable tool for achieving that ultimate goal of manufacturing—keeping the machines running.

A Final Word

If you're having a particular problem or if there is a topic you would like to have addressed in this column, please send me an email at ArvinGlobal@Gmail.com.

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