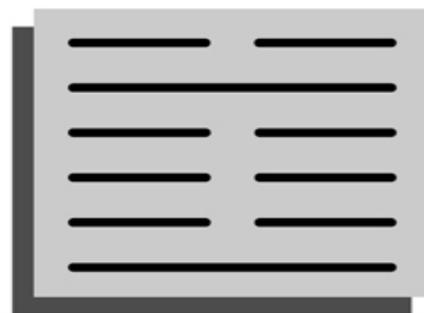


Change Management Associates



February 2013

Featured Topic



We Don't Make 'Widgets' - Lean in Job Shops

Dear Drew,

Recently I have been receiving many inquiries about the application of lean to high mix, low volume production environments. Not surprising since that seems to be the majority of manufacturers that remain in the U.S.. The conversation always starts with some form of the declaration, "Everything we do is different". This is followed by expressions of confusion, frustration and sometimes disbelief (that the concepts even apply).

I was very fortunate to have worked with a number of custom, make-to-order companies throughout the 1990s. You might say that I 'cut my lean teeth' in these companies, that produced custom windows and doors, configure-to-order pumps, custom window treatments, custom printed materials, design-to order fabricators, high variety make-to-order vending machines, and many more. I was also very fortunate to have worked with some very smart, common sense, passionate business leaders of those organizations. They never said, "that won't work here", but rather "how can we make that work here?". Working together we learned how to adapt the concepts to meet their specific needs. Successful adaptation comes first with a deep understanding of the concepts themselves. Learning what works for a specific set of circumstances comes only through experimentation.

A necessary first step is to identify existing product 'families'. The

Upcoming Events



CMA and our network affiliates have the following events scheduled:

AME Events:

3P Workshop

Newark, DE
February 27, 2013
Hosted by Siemens Healthcare Diagnostics. After a tour of the facility, an introduction to 3P will be provided. [Click here](#) for more information.

Lean Bronze Certification Course & Exam

Philadelphia, PA
March 12-13, 2013
Hosted by the DVIRC, an exam preparation workshop will be delivered to be immediately followed by the AME/SME/Shingo approved exam itself. [Click here](#) for more information.

Building Leaders for

exercise in doing so often helps people see that there is a lot more commonality than they had first believed. Wherein lies the true differences of significance between products? The fact that they require completely different materials may not be significant if a means to supply what is needed, when it is needed can be worked out. The fact that they use different equipment may actually work to one's advantage. Different 'routings' certainly are challenging, as is highly variable work content. However, I have seen flow lines effectively accommodate over 100% variation in work content. It really depends on the amount of flexibility that can be implemented. For example, at a high mix foundry business, three 'finishing' operations were combined into a single station consisting of three different pieces of equipment on which associates were trained. This greatly simplified the product 'routings' and physical flow while providing greater flexibility to handle the wide variety of parts.

In dealing with the unique challenges of each of these businesses, we learned how to adapt the concept of 'takt time' to a high variety, high mix environment. This meant understanding that takt time has several purposes. First and foremost it describes demand in a way that can be compared to the work content to determine what resources are needed to meet the variable levels of demand, most commonly found in job shops. It also can be used for short term goal setting and to set a beat, a pace, a tempo to the processing of work. Finding a meaningful expression of takt time is an essential next step. I have seen takt time expressed in terms of units, time, even dollars. Sometimes it is a very specific measure that relates solely to that business. Finding it is often like finding the "Rosetta Stone" that allows the organization to get a handle on its demand.

Often quick changeover concepts are key to promoting flow in an equipment intensive job shop. Historically changeover time was defined as 'from the last good piece to the first good piece'. In some job shops redefining the term 'piece' has provided breakthrough results. Perhaps consider what it takes to change from one 'job' to the next. For example, at a sheet metal fabrication operation, traditionally each part for a welded assembly would be separately sheared, cut (laser, punch), formed, then wait until all parts were available to be welded together to make a final assembly. By use of 'nesting' and 'gang tooling' approaches all the parts could be processed together through each operation thereby providing 'one job flow' rather than 'one piece' flow. We always look to keep a job or order together throughout the process as best as is possible.

Even in the traditional sense of changeover, great opportunities for improvement exist particularly if 'standard work' can be applied to the changeover process. The key is to focus on the process and not the product details themselves which tend to overwhelm people to the point that they cannot see the opportunity to apply standard work. The details (e.g. quality requirements) exist on engineering documentation (e.g. prints, specifications) so only a reference is needed. Therefore the focus is on the process itself. Further, in a

Tomorrow - Today!

West Point, NY

March 6-8, 2013

Hosted by the U.S. Military Academy at West Point, this very special event covers the important subject of Leadership and includes a "behind the scenes" perspective of how the USMA develops the best leaders in the world. [Click here for more!](#)

Spring Conference

San Antonio, TX

April 15-18, 2013

Keynotes, tours, presentations, workshops and more! [Go to the AME website for more information.](#)

Lean Enterprise Institute Workshops

San Francisco CA

February 5-7, 2013

Coaching Skills, Leader Standard Work, Optimizing Flow in Office & Services, VSM for the Office and more! [Click here for more information.](#)

Creating Visual Management Systems Workshop

Indianapolis IN

February 28, 2013

Hosted by Lean Frontiers this full day workshop will provide a deep dive review into this important subject. Participants will have the opportunity to design their own VMS. [Click here for more information.](#)

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job shop there are often several different types of standard work for several categories of changeovers. Think of a small 'playbook' that is referred to prior to every changeover.

Highly flexible flow lines or 'cells' often have been designed in job shops. The amount of flexibility will depend on many variables but with some ingenuity it is remarkable what can be achieved. For example, at a high mix producer of medical instruments one production cell was implemented that could handle ~120 different part numbers or SKUs. The team identified that there were really just 12 'sub-families' within the total of 120. The key was to really examine the flows, process times, and equipment requirements of each. A staffing and equipment scenario was established for each of the 12, and for several different levels of demand. Graphical depictions of each scenario allowed for quick reference. Again, think of a small 'playbook'. The company was able to effectively run all 120 different products through the same cell. This represented ~85% of total demand. Several pieces of extra equipment were included in the cell to provide needed flexibility. However, the real flexibility came from the cell itself which by its very nature created highly cross-trained associates. In the past only certain people could make particular instruments.

'Pull/Kanban Systems' have been successfully implemented in job shops to control flow between resources (typically shared). However, it is a 'sequential pull' form of system rather than a 'supermarket' that is typically found in a repetitive production environment. The key is to understand that a pull system is a decision making system. Once the proper decision making has been identified, it can be incorporated in the pull system thereby giving associates a powerful method to control the flow themselves.

These are several key concepts and examples of how they have been adapted to meet the specific circumstances and needs of organizations. The term 'job shop' refers to a wide spectrum of manufacturers. It would be impossible to provide examples for all. What is more important is to deeply understand a concept (e.g. takt time, flow, pull). Then you will be more confident to adapt it to meet your specific needs without undermining its intent and the benefits expected.

The effort to implement lean is always greater in a job shop. A greater understanding of current conditions is needed and this requires more time. Flexibility does not happen by chance, but by design. While the effort required is greater, so are the potential benefits. Custom window companies with whom we worked in the 1990s into the early 2000s experienced 500%+ increases in sales (over several years mind you) once they were able to reduce lead times from 3 weeks to as little as 3 days. Other companies were able to offer quick turnaround times for make-to-order products as a means to survive. For example, several custom pump manufacturers saw business-saving benefits of reduced lead time from 5-8 weeks to 3-5 days in a shrinking

"Lean Office & Services Simplified"
(2012 Shingo Prize recipient)

"The Complete Lean Enterprise"
(2005 Shingo Prize recipient)

VSM for Administrative & Office Processes

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Books are available at www.productivitypress.com

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Click on "News" to find articles and past newsletters. Recent newsletters are:

"Improvement Kata Speaking Helps Improvement Kata Thinking. Slideshare available on website.

"By the Numbers"
A reflection of learning over the past 25+ years on the subject of Lean Accounting

"Finding the Scientist in You: Real Learning Comes in the Journey"

"Help Wanted: Using Visual Management to Drive CI"

market.

So while you don't make 'widgets'. There is no reason that lean concepts cannot be applied in such a way to provide important, even breakthrough benefits to your organization. The key is are you willing to put in the necessary effort?

Best Regards

Drew Locher

Managing Director, Change Management Associates

Lean in Job Shops Webinar

The Association for Manufacturing Excellence (AME) will be hosting a webinar on the subject of 'Lean in Job Shops' on February 14, 2013 at 1:00-2:00PM eastern time. Anyone working in custom, high-mix production environments can benefit by attending. For more information [click here](#).



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