

Value Chains

May 2008

Inputs, Process Control and High-Variety Manufacturing

During a recent conversation with an Industrial Engineer at a structural HVAC manufacturer, he brought up this startling fact: according to a comprehensive analysis of their manufacturing errors, **40% of errors originated outside of the plant floor in design and documentation issues.**

I was also recently reading a chapter in [Lean Manufacturing for Job Shops](#) (Tristani and Irani) that introduces the concept of process control. The following statement resonated with me:

" . . . consistent inputs help give better internal work-center-to-work center quality, which tends to lower the amount of re-work a job requires. That means the work content is less, product cost is less, and product lead time through the shop is improved."

I believe that many manufacturers overlook what should be one of the easiest and potentially most critical input to control: their **manufacturing documentation.**

In high-variety manufacturing (HVM), by definition, there is variety and variation of products manufactured, and, in many cases, uniqueness of product. That means that the manufacturing documentation which details the specific requirements of the specific product or product variation to be manufactured is absolutely critical to the effectiveness (productivity and quality) of the manufacturing process.

There is no universal standard for manufacturing documentation; in HVM, especially, it needs to mirror the variation and variety of product. It must, however, include all relevant content and present it in a way that reduces and/or clarifies complexity. (One common error is to include too much irrelevant information that ends up obscuring the most critical information.) The physical organization must match the workflow of the shop floor, as must the specific presentation match the needs of each process step. That is, a drawing may be needed for some steps, but other steps may just need a dimensional cut list. In some cases generic assembly instructions or drawings may not be needed in the packet itself, but accessible on an as needed basis. The documentation also needs to reflect the needs of the workforce in terms of language and technical literacy.

Too many times, however, the manufacturing department just accepts what it receives as either it doesn't realize that the documentation can be improved or it's been told that that is another department's responsibility and not its concern. Both of these conditions, and the lack of control and quality in the manufacturing documentation, are symptomatic of a larger issue: the lack of understanding that in HVM "production" or "operations" encompasses more than just the manufacturing floor and that, as such, process and quality improvements, whether lean or other methodologies, need to extend beyond the factory threshold.

Valent Group News

Stephanie Green, Principal, is working on the Lean guidebook strategic initiative of MESA, www.mesa.org. MESA is an association of manufacturers/producers, solution providers and industry professionals, promoting innovation and best practices sharing, with a goal of delivering valuable knowledge around operations-centric enterprise solutions. The Guidebook should be released this fall.

High-Variety Manufacturing Professional Community

The High-Variety Manufacturing Professional Community, <http://highvarietyvmfg.ning.com>, is growing rapidly. The site has a global reach with members from the US, Greece, Sweden, India, UK, and many other countries. The community, founded as a resource and networking site for anyone working or interested in high-variety manufacturing is free and open to all. Please join us.

Valent Group, www.valent-group.com, a management consulting firm with an international clientele, works with high-variety manufacturers to maximize the competitive advantage and profitability available in the operations value chain. To address the complexity of the high-variety manufacturing value chain, which mirrors the variety and variability of the products, Valent Group uses a structured approach to develop the essential strategies and tactics.

Questions or comment? Email us at: services@valent-group.com

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Resources

[New Product Development: A Cornerstone of Competitive Strategy](#)

[Readings in Mass Customization](#)

[Readings and Resources in Lean and General Management](#)

[High-Variety Manufacturing: Issues and Ideas](#)

[Jobshop Lean Discussion Group](#)

[High-Variety Manufacturing Professional Community](#)