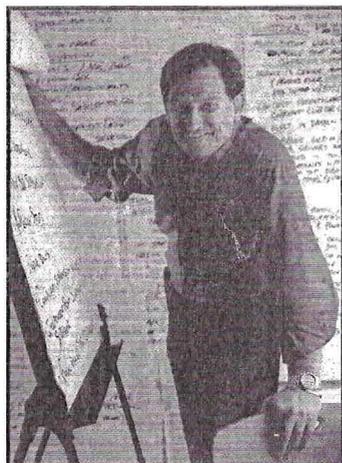


“Lean Manufacturing Starts with Lean Design” • by Sandy Munro



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While significant benefits can be achieved on the factory floor, if a company wants to realize the full benefits of lean systems, it needs to take a holistic approach to the product's entire life cycle. Lean manufacturing really begins with lean design.

Since the design ultimately dictates 70 percent of the product's downstream costs, a company only looking to become lean once the product hits the manufacturing floor can miss the largest portion of potential savings.

Lean design is an approach that enables a company to design out muda (Japanese for “waste”) from the process, rather than just tweaking the process.

Why rely on fixing problems on the manufacturing floor, when you can totally avoid problems by looking at new processing techniques or materials at the early design stages?

Lean design success revolves around three factors: a multifunctional team; the ability to look at all of the downstream activities – from manufacturing to service to recycling – during the design phase; and, most importantly, an open mind. Oddly enough, the most important factor – and most difficult feat for many design teams – is achieving an open mind ... and that's what I'd like to focus on.

One key tool that helps to open up engineers' minds is benchmarking. When an engineer objectively benchmarks competitive products – as well as products from other industries – new and innovative ideas for creating leaner, more profitable products can abound.

Often, an automotive product design engineer is only versed in certain materials and technological processes. If the engineer is comfortable with sheet metal, the engineer will generally turn to processes associated with sheet metal for designs. And all kinds of opportunities are lost.

If that same engineer is asked to work in a different way, to benchmark the competition and to explore different materials and processes with an open mind, the opportunities are almost endless.

For example, at our independent competitive analysis facility – the Harbour & Munro, L.L.C. Benchmarking Information Center – we recently tore down and analyzed a newly introduced minivan. It was immediately obvious that the design engineer for the seating system knew steel stamping and welding and, thus, chose this approach ... perhaps adding lots of expensive manufacturing operations.

We might have suggested a better approach – perhaps one that used different materials and processes. With new thinking, more expensive processes and materials many times can actually save cost when you look at the total system. In the case of the minivan we tore down, using lost-foam casting to make near net shape parts could have eliminated a lot of expensive brackets, welding and fastening operations.

While benchmarking can help products become lean, so can technology transfer. For example, in today's auto industry, success in producing low-volume specialty vehicles requires new thinking – lean thinking. Engineers need to venture out of their comfort zones and begin thinking about eliminating expensive tooling, stamping and welding operations.

To help our manufacturing clients from various industries identify solutions that can be applied to their designs, we've torn apart a variety of products – from vehicles to aircraft parts and from commercial products to cranes. Each has something to offer, if you look closely enough.

A few years ago, we helped an aircraft manufacturer redesign a portion of a tail section – reducing the assembly from 10,000 parts to just one – by utilizing a machining process borrowed from the auto industry. This design change improved reliability and added \$220,000 profit per aircraft. That's the power of lean design!

To become lean, companies need to take a more holistic approach to product development. They need to think lean early on, to benchmark products and to consider technologies used in other industries. Only a lean design can yield true lean manufacturing.