Mass customization is the customization or personalization of a product for a specific buyer at or near the price of a mass-produced product.

Artisans, craftsmen and custom shops have been “personalizing” products from the beginning of commerce — and being paid for that personalization. With mass customization we are talking about providing a custom product at the price of a mass-produced product, and in a much faster delivery cycle than possible with traditional custom shop methods.

The full span of mass customization methods and types is rather broad and beyond the scope of one article. We will concentrate on one: “Collaborative Customization.” In collaborative customization the customers work either directly with the manufacturer via an Internet connection in their home or with a salesperson at their place of business to “create” the specific product the customer wants.

The final design is a collaborative effort between the company and the customer. There are some key elements that must be in place to make this collaboration successful.

**Design, Design, Design**

While most of us might begin to look at the implications of mass customization as it relates to manufacturing, we need to start at the beginning if we hope to be successful, and that is the design of the products offered.

In collaborative customization the customer is the product designer. This concept is alien to many product designers but must be grasped. The product designers’ responsibility shifts from designing a “product” to designing components which are then “configurable” by the customer, the ultimate designer. These components must be designed with a focus on optimizing manufacturability.

It is imperative that the “collaborative” phase begins with the initial design phase. Always be focused on the customer and what the customer wants. One of our most valuable assets is our proximity to our customers — we must always leverage that advantage.

A successful design requires that an extremely high level of standardization is applied to the components used by the customer in their particular “configuration.” This standardization must apply from the “modules”
you manufacture to the hardware used to assemble those “modules.” Allowing this discipline of standardization to be ignored will ultimately result in supply and price/profit issues. Every aspect of a mass-customization program must be analyzed from a customer service and cost/benefit standpoint.

Most often the design of the components must be done in parametric CAD format. Without parametric CAD the customer’s ability is limited in configuring the exact product they want to buy as well as the seamless ability to quickly produce it. Keep in mind that the “output” of the design phase must be the “input” to the manufacturing phase, and that transition must be transparent.

**Manufacturing for the Masses**

Since the selling price of mass-customized goods is similar to mass-produced goods, obviously the manufacturing cost must be similar to maintain profitability. The focus of cost containment must be on both the manufacturing processes as well as the supply chain.

Manufacturing processes and machines must be designed for one piece flow or lot size one. This requires zero or minimum setup times between parts. CNC machinery is one of the key elements in minimizing setup times. Setup times for non-CNC machines must be minimized through effective setup reduction programs.

In most cases, mass-customization manufacturers are working with little or no demand projections. This necessitates both a “spontaneous” supply chain as well as flexible manufacturing processes. Commonly some components will be held at a “semi-finished” level to minimize lead-time requirements. These stocking decisions must be made on an individual basis and always be subject to a cost/benefit analysis.

To be spontaneous the supply chain must be simplified, and the most beneficial element in simplifying the supply chain is to minimize the SKUs required — and that takes us back to the design phase. The standardization of components that must be adhered to in the design phase is crucial to achieving supply chain simplification.

**The Bridge**

All the “right” design and all the “right” manufacturing will have little value if they are not tied together by an excellent information system designed to support the overall process. In fact, without the “right” information system don’t even attempt mass customization.

The information system must be capable of allowing the customer to configure and enter an order. This may or may not include a salesperson working with the customer. In either case the system must be capable of “flagging” conflicts or errors in the “design” as well as assisting the customer in resolving those conflicts. At
the conclusion of the design/order entry phase the customer should have both the cost and the delivery date of their order.

Once a “clean” order is developed and entered, the transition to a manufacturing information system must be immediate, seamless and “hands free.” The customer order must generate the shop orders, the machine programs and create the demand orders to vendors. Additionally, shipping and billing data must be included as part of the ordering process and be as seamless as the manufacturing and supply issues.

**In Summary**

Conversion to mass customization is not a simple process. It is one that takes commitment across the organization. Some “forms” of mass customization are less dramatic than “Collaborative Customization,” which we have discussed here, but all require a change in the business model. As we go forward the challenges of competing on an equal basis with imports will only increase. The route to continued success in this market is differentiation. That differentiation must leverage those advantages which we enjoy by virtue of geography, reduced shipping cost, lead-time advantages through reduced shipping time and our proximity and “knowledge” of our customer. Mass customization allows leveraging each one of those advantages.

The future of successful manufacturers will be based on a changed business model, a paradigm shift. Mass customization, in all its forms, will continue to grow as a percent of goods sold. Today, mass customization accounts for approximately 20 percent of all consumer goods. By 2035 mass-customized products are projected to exceed 50 percent of all goods sold.

Can you afford to “dismiss” that market share?

1 **Source:** *Identifying Future Competitive Business Strategies For the U.S. Residential Wood Furniture Industry: Benchmarking and Paradigm Shifts* by Albert Schuler and Urs Buehlmann.

**from:** *Wood Digest, Jan 2006*