

**Digital Design and Manufacturing:  
New Ideas and Technologies for Competitiveness**

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**ABSTRACT**

For an organization to be globally competitive, they must have some unique characteristic that enables them to beat competitors. "Innovation" is usually touted as part of the competitive edge -- but how do you reduce this to practice for engineered products? In part, the answer involves new design and manufacturing technologies that enable new business opportunities and practices, supply chains, methods of engaging customers, and so on. In this talk, I will focus on three types of "manufacturing" and their enabling technologies. "Local manufacturing" refers to the capability of fabricating products close to the customer, which may have significant value if short delivery times, avoidance of shipping costs, or customer interaction are key elements. "Custom manufacturing" means the capability of adapting a product to the critical needs or desires of each customer. "Low volume manufacturing" simply means that lot sizes are smaller than typical for mass production.

None of these types of manufacturing is terribly new; however, new classes of technologies enable cost-effective applications that were not available a few years ago. Specifically, I will discuss additive manufacturing, reverse engineering, and web-based computer-aided design technologies. Several new engineering and business practices will be presented. Many examples will be used to illustrate the technologies and practices.