

# Complex Manufacturers

## Quality Insider Article

In the first quarter of 2007, my company conducted a complex-manufacturing research survey of 1,473 senior management level executives (CEO, COO, CFO, vice-president of operations). Complex manufacturers were defined as those employing “other than exclusively repetitive manufacturing processes” including engineer-to-order, made-to-order, and assemble-to-order. The data include a wide range of industry cross-sections, geography, public and private companies, numbers of employees, and annual revenues, and revealed a clear change from a similar survey done in 2000. The statistically significant difference from the identical 2000 survey to the current 2007 survey is that the complex manufacturers face increasing business and global requirements. There’s also an increasing international diversity of customers, suppliers, and partners.

<b>Complex Manufacturers</b>		
	2000	2007
Global customers	29%	49%
Global suppliers	21%	58%
Global partners	20%	51%

Similarly, additional remote locations and the need for improved round-the-clock responsiveness have changed the communication requirements for complex project-based manufacturers.

<b>Complex Manufacturers</b>		
	2000	2006
Remote locations	24%	57%

Other demands, including compliance requirements, and internal and external collaboration are driving the need for data accessibility. “Data accessibility must include a common set of numbers, historical views, and improved analysis. Internal and external employees all require access to the same data. Flexibility in accessibility and speed to communicate easily is critical with multiple locations. Multiple locations, time zones, currencies, and languages are the norm for many complex manufacturers, placing additional communication challenges on the organization, ” says Randy Richel, CEO and general manager of Trakware.

Quality technology solutions provide a direct link and constant feedback between the design and manufacturing processes from woodworking to custom-yacht building.

“These one-of-a-kind companies must innovate around new opportunities, rapidly getting to market, while at the same time ensuring product quality,” Richel adds. “This proves to be a challenge, as innovation by its very nature induces variability. Manufacturing execution systems (MES) provide a framework for enabling rapid change due to innovation, while at the same time managing risk, ensuring product quality, enforcing the adoption of new processes and maximizing production yields. Real-time parametric process and product analytical data must be used for continuous improvement of both product and process design.”

Engineer-to-order (ETO) manufacturing execution systems systems improve compliance by providing regulators with documented evidence of the manufacturer’s process understanding and control strategies. Integrated systems can improve business processes and facilitate robust design, operational excellence, manufacturing control, and quality management, including change and requirement management.

“It is important that these manufacturers find solutions that will streamline and improve collaboration between research and development, engineering, and manufacturing to improve the design for manufacturability and shorten time to market. Integration to the MES manufacturing database containing the ‘as built’ records is a necessary step to enable continuous improvement of both product and process design,” Richel notes.

Mobility is crucial to competitiveness among complex manufacturers, and cost containment is critical for lean manufacturing. Responsiveness drives higher customer satisfaction and workflow improves organization efficiency. Data accessibility drives decision-making speed, and consolidation has become increasingly important for mergers and acquisition integration, as well as financial compliance. Technology remains critical for the business infrastructure and its supportability; audit ability will continue to grow in importance.

### **Custom manufacturers are slow to adopt technology despite quality effect**

The vast majority of companies rely on enterprise resource planning (ERP) and database-management capabilities to accomplish enterprise tasks today. Emerging technologies, such as next generation MES manufacturing intelligence, and business analytics are playing an increasingly important role. Because ETO manufacturers have always been slower adopters of new technology, it isn’t surprising that over the next three years project-based manufacturers will pursue rapid adoption of manufacturing intelligence solutions, business analytics, and real-time key performance indicators enabling continual improvement, and provide the fuel for future innovation.

Richel asserts that only with improved communication with suppliers, partners, customers, and employees can the business processes’ quality be optimized, leading to increased responsiveness that enables new levels of quantified quality metrics throughout the global enterprise.

### **About the author**

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