



Status Quo Versus the Improvement Instinct

There's a battle out there in the world of product design, and victory is up for grabs. On one side: normal everyday human resistance to change. On the other: the evergreen urge to do better. How do you know when the status quo is winning? When you find yourself clinging to a product design, even though you know it costs too much to make. When you start tweaking a design instead of creatively rethinking it. When you focus so much on leaning up manufacturing that you forget a simple fact: a new product design might completely eliminate those process steps.

Is there such a thing as the instinct to improve? Does your organization have it?

Best wishes for a Happy New Year.

Sincerely yours,
John Gilligan, President

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**2007 International
Forum on DFMA**

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DFMA Forum News
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DFMA in Practice

Symbol Mobilizes on a Redesign

Symbol Technologies, based in Holtsville, N.Y., builds handheld mobile computers that stand up to lots of challenging environments. The company's handhelds are at work nearly everywhere, checking out purchases and stocking storerooms, monitoring luggage and tracking rental cars, even scanning tickets at Mets games. Subject to strict regulation and security requirements set by the credit and banking industries, these devices are handled hundreds or thousands of times a day and must endure rough use without failing.

Recently, Symbol used DFMA software to take a fresh look at the design of its MC9000 handheld. "We wanted to reduce cost, cut assembly times, and improve quality, all at the same time," says Mike Foley, manufacturing process engineer. "We knew we could do that by reducing the number of parts."

The MC9000 is a rugged device that includes a scanner, a small computer, and a wireless transmitter for sending data over local or cellular networks. The redesign had to offer the same form factors as the old model, which had a large installed base. It also had to be compatible with accessories, use the same batteries, and incorporate the same key service features.

Redesign followed a well-documented path. The cross-functional DFMA team at Symbol included mechanical, electrical, and process engineers. They quickly noticed that the MC9000 had two printed circuitboards. One board included the main product capabilities and the other carried customer options. But were two circuitboards really necessary?

The engineers realized that putting standard and optional components on a single board would lower the part count, shorten cables and cable routing distances, promote easier assembly, and improve ruggedness. More savings came from rethinking the protective rubber shock-absorbing system that helps the MC9000 chassis get through its long days. Stepping back to consider the entire product design, the team saw how to combine the four-part assembly into one.

In the end, DFMA helped Symbol cut part count by 20 percent and assembly labor time by 17 percent. Now who's the tough one on the block?

To read the full-length case study, please **click [HERE](#)**.





DFMA Forum News

The International Forum on DFMA, sponsored by Boothroyd Dewhurst, Inc., is the foremost conference worldwide on early design analysis methodologies and implementation. The 2007 International Forum on DFMA will take place June 19-20 at the Crowne Plaza Hotel, Providence-Warwick, Rhode Island. For more information or to register, please [click HERE](#).

If you are interested in presenting at the 2007 Forum, the deadline for paper submissions is nearing. Open spaces are still available. For suggestions about paper topics and instructions on submitting an abstract, please [click HERE](#).

DFMA News Briefs

Editor Susan Avery of *Purchasing* attended the 2006 International Forum on DFMA and came away from the panel discussion with strong impressions about how engineering organizations should work with suppliers on cost issues. Read her comments by [clicking HERE](#).

In an article called "Part Cutters," editor Joe Ogando of *Design News* describes Hypertherm's aggressive use of DFMA in the design of a new plasma cutter. Engineering manager Mike Shipulski reveals how his team reduced the number of parts from 1000 to about 500, quadrupled throughput, and saved \$5 million in assembly costs. Please [click HERE](#) to read the article.

Are you concerned about the health of R&D in the United States? John Teresko of *IndustryWeek* considers the topic in an article called "Recapturing R&D Leadership." He discusses intellectual property, government funding, and lean as an enterprise strategy, pointing to Dell Corp.'s use of DFMA as an example of the latter. Please [click HERE](#) to read this article.

Q & A on "Should Cost"

Q: What is should-cost analysis?

A: It is analysis that estimates the true manufacturing cost of a part. Should-cost analysis is based on a true manufacturing cost model, which accounts for the cost of the material, labor, machine and general-purpose tool usage, energy consumed, overhead, and dedicated tooling required to manufacture a part.

Q: How is a should-cost estimate useful?

A: Frequently, the results of a should-cost analysis are used as a basis for comparing supplier price quotes. When making these cost versus price comparisons, it is important to realize that supplier price quotes commonly reflect what the market will bear, not necessarily the true cost to manufacture a part.

Minimum Part Count



You Could Win an iPod nano!

Hundreds of Fortune 1000 companies use Design for Manufacture and Assembly to cut the costs of their manufactured products and achieve design innovation in their markets. How well do you understand the principles of DFMA? [click HERE](#) to take a quick pop quiz and qualify to win an Apple iPod nano.

DFMA at Celestica

"The scope of the project was set to include all aspects of mechanical assembly including final assembly, sub-assembly and mechanical fabrication with a small amount of overlap into the [printed circuit assembly] space to cover board mechanicals. The range of products covered would include multiple industry sectors and product sizes – from cell phones to telecom switching cabinets the size of a refrigerator."

Excerpted from "Celestica Early Product Reviews Empower Customer Design Teams," a paper by John Allen of Celestica Corp. Of 18 presentations at the 2006 International Forum on Design for Manufacture and Assembly, this one was voted most popular. Download the original paper now by [clicking HERE](#).