

## Showing the Money

By [Gary S. Vasilash](#), Editor-In-Chief

**As more companies drive toward improving their levels of quality, they may be getting to a place where an understanding of just what "quality" means is not particularly clear to those who are responsible for achieving it. One consulting organization is utilizing a system that not only shows the cost of problems, but provides a letter grade, just like in school.**

Simplicity, says Ivan Chambers, a quality expert at Munro & Associates (Troy, MI), a consulting firm that's generally associated with design for manufacturability and assembly (DFM/DFA), is something that companies ought to strive for. It can lead to better quality and, importantly, improved profitability.

A bit of background: Chambers became familiar with Sandy Munro, founder and president of the firm, when he, Chambers, was program manager of Six Sigma Training at Texas Instruments' Defense Systems & Electronics Group. That group was to receive a Malcolm Baldrige National Quality Award in 1992, while Chambers was still there.

Chambers and his colleagues at TI embraced DFM/DFA, a methodology which emphasizes fundamentals, such as looking at assemblies and asking whether the various component parts are essential. Often it is found that as many as a third of the parts are unnecessary; they are either eliminated or their functions are combined with another part or parts.

### Another Way Of Thinking "Six Sigma"

According to Munro & Associates, "average" companies are at a Four Sigma level. These companies tend to spend an amount equal to 25% of their sales volumes on non-value-added activities in order to deal with defects being produced as a result of product design and/or manufacturing problems. Six Sigma companies spend just 1% of their sales dollars on these problems.

But a concern he had was that although DFM/DFA called for a simple design at the macro, or assembly level, he wasn't so sure that it wasn't leading to a situation where complexity was driven down to the micro, or individual part, level. So a goal that he set for himself was to determine whether that driven-down complexity could be predicted early on in the process, while the design is still in the conceptual—or what he calls "paper napkin"—phase. This predictive ability would allow people in companies to determine the likely incidents of defects and, importantly, the associated costs for those defects. DFM/DFA reduces the opportunity for defects. Chambers wanted to go further, to address the costs that are engendered by designs and processes.

### Looking for Meaning

"Six Sigma really means nothing to a lot of people," Sandy Munro says. "If they're not a statistician"—or an expert like Ivan Chambers—"they probably find it too confusing to work with." Theoretically, Six Sigma initiatives are fine, but from a practical working level, Six Sigma is probably more talked about than understood.

Chambers joined Munro's firm in 1996. As work was being done on the quality/cost predictive methodology, there were also efforts under way at the firm to assure that whatever was developed would be meaningful to people—something that they could work with. Chambers points out that quality expert Joseph Juran counseled people to

use the "language of management." Everyone—even non-managers—understand that language. It's about money.

So part of the methodology that was developed results in a calculation of the total cost of poor quality. It is spelled out in dollars and cents. Another result, one that can be more readily grasped by people than sigma numbers, is a letter grade, ranging from A+ (don't you wish) all the way to F (hope that it isn't). The program was given a name: the Munro Quality Report Card.

### Simple Steps

The methodology behind the Report Card is simple. Munro consultants go to a plant where a product is being produced and ask a series of structured questions. They list every part and learn about all of the processes. In some cases hard, statistical data is provided. In other cases, it is a matter of getting information from operators (this is flagged as "opinion," but still valued). The goal is to find all possible sources of defects and errors, including those that are typically hidden, such as when dedicated workers fix problems in their work area before the parts are sent down the line. This information is shared with plant personnel. Typically, Chambers says, their reaction to the initial study is that things are much worse. Then the plant people go out and do a second pass. The whole process takes a couple of days.

The output is a document that spells out the cost of defects, the number of defects produced per year, and the annual cost of poor quality. There is a sigma level calculated and a quality grade associated with that number.

### Where to Focus

One thing that the Munro Quality Report Card does is provide an indication of where they should apply their resources so that they can work to reduce costs. It may be determined that new tooling is in order to address the problem. Or it may be a matter of needing to change the design, which then leads to the DFM/DFA methodology. In effect, the study provides a basis for both short-term (i.e., making fixes on the factory floor) and long-term (i.e., redesign the product) decision making.

### Revealing the Hidden Factory

One of the things that suppliers ordinarily do is produce parts to customer specs. Chambers cites a case where a supplier that had performed a Munro Quality Report Card initiative within its facility decided that it would have one of its suppliers undergo the same regime. The result of this assessment was that the subsupplier was able to show the customer that the part that it was producing was, as designed, causing X problems on a regular basis. Although that subsupplier was shipping products at a world-class quality level to the customer, in order to achieve that level it was performing extensive containment activities that kept the bad ones from being shipped. This led to additional costs, costs that were previously invisible. It was the proverbial "hidden factory," where non-value-added activities are performed.

By redesigning the component and taking into account its supplier's capabilities, the customer was able to get the same high quality that it had come to expect and, because the non-value-added containment activity at the supplier was eliminated, it was able to get the parts at a better price.

So what's the bottom line? According to Chambers, those companies that have used this methodology have realized "hundreds of thousands of dollars of savings." It may be that companies can't afford not to use it. **AD&P**