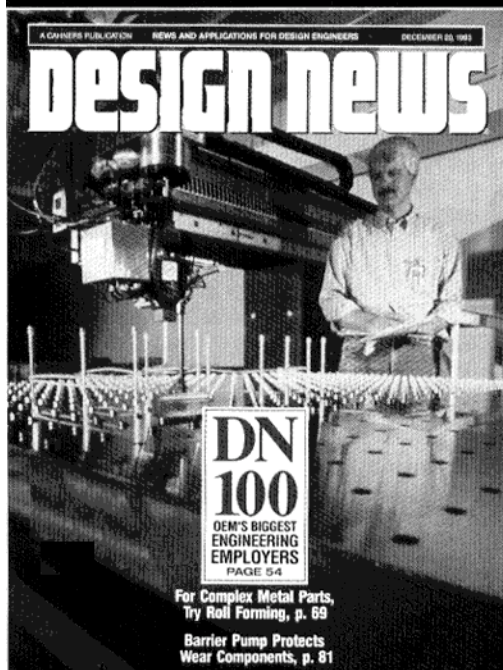
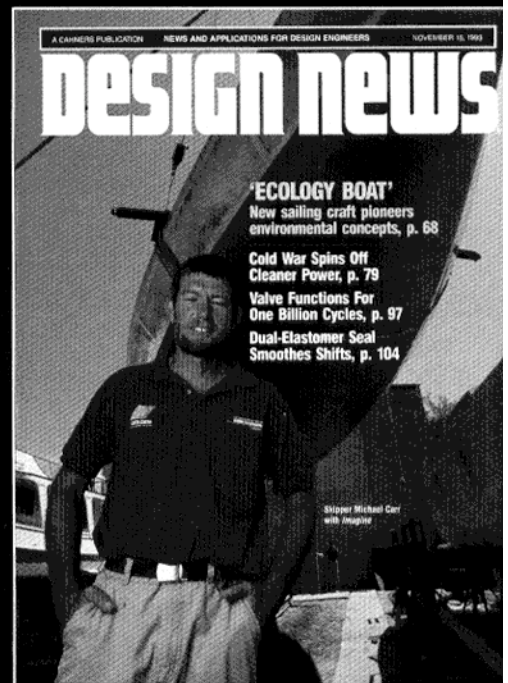


DESIGN NEWS[®]



How metrics cut time-to-market

Using QFD to Develop Your Product



QFD: Applying 'The 80-20 Rule'

ASK THE MANAGER

Q What is the cost of implementing all Four Houses of Quality?

A QFD's cost depends on many items, including project size, complexity, the difficulty of obtaining customer requirements, and the number of product variables changing at the same time. One case study involved a manufacturer of paper goods that was designing both a new product and a new manufacturing process for it. The company decided in advance that it would execute all four Houses to completion. It took a team of 10 people one day per week for 8.5 months, plus airplane and travel expense for four of the members.

The effort was an entire success. Product design could be done directly from the QFD documentation and the knowledge that the participants gained from discussion and analysis. Relationships also improved between engineering and manufacturing, where barriers due to geographic distances had existed for some time. Assuming \$75 per hour, which is a reasonable burdened hourly rate for engineering time, the resource time cost \$222,000. Assuming \$1,000 per trip, travel expenses totaled \$148,000. Total QFD implementation cost: \$370,000.

Q Is the use of QFD as widespread as the publicity would have one believe?

A Probably not. Many leading companies known for their leading products and processes, such as Motorola, have tried QFD. For certain projects or in certain departments where development teams have achieved positive results, QFD is used in an ongoing manner as the approach of choice. One international benchmarking study indicates that QFD may be used in 5-10% of the projects in companies that have "adopted the methodology." Many industrial leaders do not use it at all. A higher incidence of use occurs in the automotive and heavy-equipment industries. Many electronics companies have experience with QFD. □

QFD: Applying 'The 80-20 Rule'

Quality Function Deployment (QFD) in its original "matrix" form through its evolution to "Four Houses of Quality" has been available to industry for 15-plus years. House of Quality "early-adopters" have tested the Four-House approach for the past five years with mixed success. Experts passionately debate QFD merits and concerns at industry conferences, and some common themes, across industries, are emerging.

First, the good news. QFD generally improves the team's ability to define and/or design a product's attributes. It is a robust framework that provides equally for customer requirements, design capabilities, process capabilities, and competitive analysis. These four comprise the most important design considerations upon which a team needs to focus to define product requirements successfully. The QFD process also generally aids team-building between everyone representing their different professional functions. The Four-Houses approach provides a common framework and thinking process for the team members, whose values and beliefs often differ.

However, QFD alone is not sufficient to ensure a successful product outcome. QFD does not deal with the management aspects of developing a product, such as managing project schedule, product cost, and profitability. It is an analytical framework that requires its own unique process to create, including significant information gathering activities.

QFD challenges. QFD takes a fairly long time to implement. Only a few companies that have tried QFD have completed all four Houses. The earliest adopters needed to implement all the Houses to establish the methodology, but more recent early adopters essentially limit the analysis to the first House. Numerous cases exist where QFD training was completed, a single effort was made, and QFD was not carried forward. QFD is also expensive, a cost carried in person-hours needed to complete the analysis. Additional software and training may also increase costs.

At some point, the results of QFD must be transferred and augmented to include the information necessary for Customer Requirements and Product Specification documents to begin product design. It is difficult to translate QFD into requirements, specs, and design in a concurrent manner. More traditional definition processes and tools, if executed in a robust manner, have a better chance at concurrent definition and design.

On the other hand, companies may wish to consider all Four Houses of Quality for several reasons. They may want to design both a new product and a new manufacturing process. Their product requirements and designs may be stretching their manufacturing process capability. They may be experiencing organizational friction between engineering and manufacturing. Growing companies may find it difficult to blend teams of older veterans with new college graduates or to handle strategic partnerships or mergers.

Most companies should consider at least the first House of Quality if they are wrestling with situations such as: designing highly complex products; identifying customer requirements in unique environments (defense and job-shops); reacting to frequent disconnects between customers, marketing, and engineering; embracing general improvements in product definition; or training and educating employees in forward-looking methodologies. However, consider QFD, especially beyond House One, very carefully. □



QFD improves a team's ability to define a product's attributes.

Bradford L. Goldense

CMfgE, CPIM, CDP
Goldense Group, Inc.
Cambridge, MA