Design Reviews Reduce Time to Market

Design reviews rank near the top of product-development techniques for keeping projects on schedule and within budget, but only if they are performed properly and early in the process.

Some companies consider their examination of prototypes to be a design review. It's not; it's a quality control review of an "as-built" product. If the prototype does not meet specs, the design team issues a change order to rectify the issue findings. And change orders take two days to two months to complete. So these late reviews do not reduce time to market, they extend it.

Perhaps the U.S. Government is to blame for this practice. Design reviews were first documented in Air Force MIL-STD-1521 and many commercial companies adopted and adapted them. MIL-STD reviews included those of prototypes and initial production-run products. All of this made sense, given the arms-length nature of government product managers from the contracted design and development companies.

In the commercial world, product design and its associated costs get frozen when 10 to 25% of the development budget has been spent. Prototypes-to-spec, most often, are built after this point in the process. Finding a defect then means a formal fix cycle must start, not a design change. Of course, developers need to review as-built products, and always will. Design reviews, however, should greatly reduce the number of defects that must be fixed when discovered in a quality-control review.

Before the era of 3D and solids/surface modeling, best-practice companies assembled independent groups of developers to sit with development teams and review product designs. Everyone spoke the language of printed drawings, including manufacturing personnel. The teams discovered and fixed many defects and glitches before the prints were released. Although solids and surface modeling brought many design and engineering advantages, it also eliminated the common cross-functional language of printed drawings that had been used for decades. More and more, design reviews fell later in the product-development cycle because at that point, the team could communicate in another shared language, the prototype.

Today, cross-functional product-development teams again share a common language. Designs and processes are now modeled and simulated from concept through shipping and logistics by all value-added organizations. Design reviews, however, are not being held early enough, despite the fact that all cross-functions share a common digital language. This creates an opportunity for design reviews to play stronger and more positive roles in the digital era than they currently do.

The current fly-in-the-ointment for the timing of design reviews is 3D printing. These 3D-printed objects are increasingly becoming true prototypes. In the next few years, as this technology matures and rapid tooling and rapid manufacturing also come of age, these prototypes will be sold to customers. Rapid prototypes will be the digital-era definition of full form-and-function prototypes. Within a few years, all companies will widely use 3D capabilities. It will reset the industry standards for design/development and time to market. In that new era, finding a defect in a rapid prototype will be analogous to finding fault in an as-built product review today.

Industries should soon realize that rapid prototyping really improves the process of ferreting out faults and defects in designs and processes. When rapid tooling and manufacturing become the new global standard, however, companies will be wishing they had already the mastered the process of reviewing digital designs. md

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