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How to Reduce Design Cost: A Contrarian View

There has been tremendous pressure to reduce the cost of design for capital equipment during the last few years. Driven by ever-decreasing prices in the end markets and expansion of the global economy, companies are closely examining their R&D costs. This has led to decreased R&D expenses as a percentage of revenues. Unfortunately, too many companies have focused on the wrong elements in their attempts to reduce design costs. This article will address simple organizational and process changes that can dramatically reduce design cost.

The first key to reducing design cost is accelerating the design pace. There is a direct correlation to development schedule and development cost. Even if the total man-hours are estimated to be the same, a program with a longer schedule will invariably cost more.

A similar corollary is that a late program is also an over-budget program. The first step in increasing speed is to assemble an experienced design team with the required skills that has experience working together. It is critical that the team has this collaboration experience; otherwise there will be delays and misunderstandings as the team dynamics evolve.

Maintaining a senior, stable engineering group is an essential element in pulling together such a team. This approach changes the focus from finding cheap engineering to creating the best engineering teams. Although experienced engineering teams will command higher salaries, the resulting high-quality design, faster execution and fewer errors more than offset the higher salary cost.

Mistakes are extremely expensive in a complex capital equipment program. A design that does not meet performance or misses the COGS targets will need to be re-designed, causing delays and increasing cost. In many cases, the product is already committed to a customer and delaying shipment is not acceptable. In these cases, an immature design is shipped into the field and the higher costs are absorbed in the support organizations. While an experienced team will certainly make mistakes, the mistakes will be fewer in number and more quickly addressed. An inexperienced team will take much longer to even realize there is a problem, and take much longer to resolve it.

Accelerating the design phase will also reduce the chance that changes will be requested. While no program is immune to new customer input, new marketing direction, or a change to corporate strategy, a program that takes longer to be completed will inherently face more demands to change. Changes, especially late in a program, dramatically affect schedule and increase development cost.

An experienced design team has the advantage of implicit trust with the constituencies they must satisfy. Companies often build in many process checks to catch poor designs before they



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move too far through the development cycle. Such intensive checks can dramatically slow the design team, but are needed if the other groups don't believe the design will meet their requirements. With an experienced design team that is trusted by the organization, these checks can be minimized and primarily be used to inform the other groups on what will be needed to move the design along quickly.

Creating a design process that minimizes hand-offs will reduce development cost. A handoff occurs when one specialist passes the design to another, adding only their part of the design. This typically happens when a systems designer passes the design to a detail designer, who then passes it to document control, who then hands it off to purchasing, who then hands it off to manufacturing. Even if all these exchanges are crisply executed, it takes much longer than having a senior engineer handle it all the way through. Most organizations believe this is a poor use of the senior engineer's time, but the reality is that every handoff slows things down and introduces errors into the process. If you want the design team to have the ability to go fast, give them the option to take the design from beginning to end in those cases where time is critical.

All of these steps are simple to do and will dramatically reduce design costs and improve results. Following this process will not only reduce program development costs, but tends to improve your design team's morale and employee retention rate at the same time.

Note: This is a summary of "Cutting Design Costs: A Contrarian View" J. Apgar, Electronics Supply & Manufacturing, February 2006.