

How Design Engineering Impacts the Value of the End Product

Regardless of the market – medical, industrial, aerospace, or agriculture – end users are becoming more knowledgeable and demanding more when shopping for goods and services. Simultaneously, management is driving operations to do more with less, better, faster and cheaper. When companies are squeezed at both ends, from the customer and upper management, it becomes even more difficult to align priorities. Something has to give.

In business today, the concept of value-based purchasing is more relevant than ever. The value model is summarized in a very simple equation: $Value = Quality/Cost$. Like any equation, to increase the quotient we need to increase the numerator or decrease the denominator; in the case of value, preferably we do both.

More often than not, when a customer buys purely on price, the consequences of poor performance linger long after the satisfaction of the low price has worn off. Functionality may suffer and the time spent managing repairs, warranty claims, and finding a potential replacement is often higher than investing in a more expensive part to begin with, which lowers the overall value.

The same is true when buying on quality alone. While high quality is always desirable, paying an inflated price for perceived quality or a part that is overengineered for your needs, can cause undesirable effects such as budget overruns and delayed product launches. Additionally, the high cost of the end product may scare away potential customers, further lowering the value. The sweet spot for value-based purchasing is to provide the highest quality at the lowest possible price, and in order for your overall system to be successful, each of the components need to work together seamlessly.

Quality: Engineer to order

Work with suppliers who are the best at what they do, and then listen to them. Rely on their expertise and experience to develop the components for your end product's system. The process of "engineer to order" is the perfect example of this concept – don't attempt to make an off-the-shelf product fit a specialized system's performance demands. Tailoring to your product's exact requirements is essential to achieving the functionality that will meet and exceed your customer's expectations. This allows your company to dedicate its limited design and development resources to other portions of the system or the next big upcoming project. In this portion of the equation, your system's success is directly tied to how well it operates once in the hands of the end customer.

Cost: Time is money

It is well understood that as lot size increases, the unit price decreases. What is not always clear is how the involvement of the supplier early in the design and development phase can avoid costly delays. Often the end product's motion control functionality is an afterthought, causing engineers to race around looking for a solution at the 11th hour. Deadlines are missed, product launches are delayed, and no one is happy. Fire drills like these are easily avoided when the product designer and the supplier are involved from the beginning. Plus, don't forget that the mean total cost of ownership (TCO) can be negatively affected by parts with inherent flaws from either poor functionality or craftsmanship, which can lead to returned goods, as well as field failures.

Engineering design firms and OEMs that consider their systems' components earlier in the design and development phase are better suited to deliver products with the highest value for their customers. Keeping your eye on quality opportunities will result in lower costs and can help you hit the value bullseye every time. Engineers play an important part in the value-based purchasing environment, and should continue to keep options open to find potential places to address the value equation within their own organization.