

Complexity — a product's silent killer



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I had the great fortune to work under a very wise engineering manager at two points in my career, first as a graduate and almost 20 years later while leading a design team.

John was of the generation that used a slide rule in college (Google it kids) and had amassed decades of practical experience designing products that resulted in millions of dollars in sales.

John often referred to a complex design as an “engineering marvel.” It was not a compliment. It meant that there were more things that could go wrong than you could shake a stick at.

The ultimate accolade from John was that one’s design was “elegantly simple.”

Supporting John’s position, fellow engineer Leonardo da Vinci is reported to have said, “Simplicity is the ultimate sophistication.” That’s pretty good company.

This might seem counterintuitive. We live in a world where we expect to “have it your way” with highly customized products and services. Access to ever-increasing and low-cost computing power would appear to allow one to manage variation. Why limit customers?

Product and service variation can take on many forms:

- Number of different product lines offered and supported.
- Number of options available on a given line.
- Number of services provided.
- Number of various means of serving customers (walk-in, phone, mail, online, referral).

Without a well-designed system to manage variation, complexity reigns. Most organizations severely underestimate the true cost of complexity in their business, which is hidden in defects, disappointed (lost) customers and frustrated employees.

While simplicity doesn’t guarantee something will be easy, complexity almost assures it will not be.

Defining our niche allows us to define the finite number of systems that are required to consistently offer customers a great experience with a customized output.

For example, McDonald’s has a robust system in place for supplying hamburgers without onions. But try ordering an omelet there without jalapenos and you’ll get a funny look.

Later in my career, our design team developed a hydraulic motor for the aerial lift industry. Because most units were sold into the rental vehicle market and driven by operators several feet up in the air, it was critical that the product be extremely safe, simple to control and cost effective.

As much as possible, we attempted to re-use proven components from existing products. Time and again during the design effort we were tempted to add a bell or whistle to the design in order to appeal to an additional market, but at the risk of losing our primary target — aerial lifts. We consistently resisted those temptations, keeping a laser-like focus on the aerial lift market.

A co-worker brought an unassembled prototype unit in a box to a group of middle school girls who were interested in engineering. When she reported that they correctly assembled the unit, without instructions, we knew we had what John would call an “elegantly simple” design.

The product went on to dominate not only the aerial lift market, but also many of the peripheral markets that we had avoided by not adding bells and whistles. The low cost of the aerial lift motor allowed customers to purchase it and cost effectively add the needed bells and whistles themselves.

“Never say ‘no’ to a customer” is an outdated and misguided mantra. The best one can hope for is to be-

come a jack of all trades, a master of none. That’s not a recipe for success today when competing against a field of focused masters.

The key word is focus. Successful organizations continually define what business they are in and, perhaps more importantly, which ones they are not. They understand that riches are in the niches.

RICK SAYS

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