The DFSS Vision

Much has been written about Design for Six Sigma (DFSS) and why many companies are using it. Compared to traditional Lean Six Sigma (or the DMAIC process), DFSS seems a little harder to grasp, especially in the realm of financial accountability and results. Hence, we have put together some data that we have acquired through various conference presentations and interviews with distinguished practitioners, as well as some of our clients who have implemented DFSS. The purpose of this data is to explain the advantages of DFSS.

These are some of the major points stemming from our research:

1. DFSS has provided at least a one sigma gain in quality at launch over previous designs. This is a major improvement, although many companies believe that if they are not at six sigma capability at launch, DFSS is a failure. What other methodology can make that kind of gain and claim? If a company has one, they ought to be using it.
2. DFSS should decrease time to market by at least 25%. A conservative interval estimate is a 25%-40% reduction in time to market.
3. Cost savings due to total resources utilized, which is highly correlated to time, is in the 20%-40% range. Note that this is only resource savings—there are other savings as well, e.g., the savings due to a 30-fold reduction (from, say, 4 sigma to 5 sigma) in defects.

All three of the above are highly correlated and if we improve in any one area, there is a synergistic effect among cost, quality, and timeliness.

Other advantages of DFSS include:

- Better models that are reusable or easily updated based on new data. Two-thirds of most designs have already been done, and only one-third of the designs truly focus on brand new features, implying that we must do a better job of using previous designs. Using the DFSS methodology and the DFSS scorecard will make this much easier.
- A disciplined approach to implementation accountability (more on this later).
- Better and more consistent data collection. The DFSS scorecard demands this and is the implementation vehicle.
- Interfaces are accounted for up front. Because of the systems approach of DFSS, interfaces are more formally addressed from the start which is important because it is in the interfaces where most of the glitches occur.
- Using data and the DFSS scorecard, we can zero in on the most likely causes of failure rather than relying on conjecture. The DFSS scorecard will give clues as to how we can get over the fire fight faster. Ninety (90) percent of fire fighting should be avoidable, and it is usually parameter drift that ultimately leads to the fire fights. All of this contributes, of course, to the ultimate reduction in risk, which is what we are really striving for.

When dealing with DFSS, organizations must stress implementation accountability as much as financial accountability. When stressing the importance of DFSS, company leadership must emphasize the importance of being faithful to the DFSS process. That means the disciplined and meticulous use of the DFSS tools, like QFD for understanding the Voice of the Customer and translating that voice into meaningful parameters that engineers and practitioners better understand, and the likes of other tools such as transfer functions (i.e., models), expected value analysis, robust/parameter design, tolerance allocation, sensitivity analysis, and others. If companies do not want to use the tools, they will not garner the benefits. It is as simple as that. In DFSS, one has to have the faith that if we use these powerful

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tools, we will ultimately reap the benefits. That is what the experience at GE, Lockheed Martin, Seagate, DuPont, Xerox and others is showing. Unfortunately, there is much going on in the marketplace today that indicates many companies want to avoid the hard work and get to the savings directly, i.e., there is some magical potion that will automatically bring in the savings. Not so. We have some phenomenal tools in our modern era that we have not had before, but if we don't use them, we really can't expect the results. "New" tools include established concepts having a "new" or easier way of implementing them and making them accessible to the masses—namely, through better hardware and software.

Furthermore, companies talk about wanting culture change. Without more and more powerful tools (witness the introduction of the horse, the wheel, the printing press, and the computer as historical evidence), culture change will be ultra slow, no matter how badly we may want to change. Breakthrough improvement will not happen without powerful tools. So in an evolving era that seems to be once again migrating to the need of feeling good about things in order to bring about change, we need to remind ourselves that the tools are indeed important and must be used to facilitate change. In deploying DFSS, implementation accountability is as important as financial accountability because use leads to results. Besides, implementation accountability is easier to track.
Companies should not abandon their new product development process altogether and replace it with IDOV (the Identify, Design, Optimize, and Validate phases of DFSS). Rather, they should take the best of the DFSS methodology, tools, and techniques and integrate them into their new product development process. Of course, utilizing the lean principles, they also need to streamline their new product development process and eliminate non-value added activities whenever possible.

means "ease of use."