TECHNICAL PROBLEM SOLUTIONS LLC
NEWSLETTER
SEPTEMBER 2012

Six Sigma versus Statistical Engineering (SE)

Which approach is better? Which methodology should your company choose? Well, both approaches are sound problem solving tools. It all depends on your preferred approach.

Successful business performance improvement programs share common traits. They are customer focused. They require active engagement of senior leadership. Results are achieved project by project. Projects are data driven and ultimately the program will result in a change to the company's culture regarding customer quality, problem solving and problem prevention. These elements are features of all successful business performance improvement programs.

The key differences are in the role of statistical analysis and in project planning and execution. Most Six Sigma programs feature weeks of training in statistics. Students are taught to understand descriptive statistics. Students are often taught facilitation skills to support brainstorming and fishbone diagrams. Projects usually start with a meeting of subject matter experts to produce a list of possible causes. This often leads to large experiments that sort through the possible causes. Project success depends on the true root cause being on the list. Therefore, teams select more possible causes rather than fewer. This makes the application of statistical software, e.g. Minitab essential.

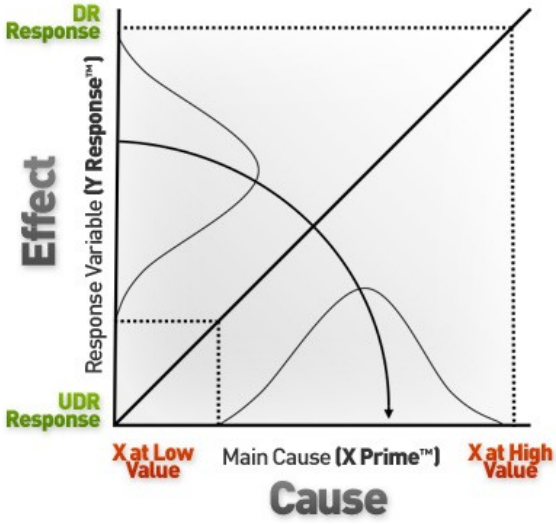
On the other hand, Statistical Engineering (SE) projects are evidence based; converging on the largest source of variation, the X Prime. By focusing on variation, i.e. the change in the Y Response, the goal becomes the discovery of the term with the largest value. The largest value will result from a combination of a significant coefficient and a large change in X Prime. The goal of a SE investigation is to rapidly converge on the critical few terms contributing most of the variation. In many projects, the X Prime is an interaction among Independent inputs (X's). SE tools are highly effective in revealing these interactions. SE projects feature the discovery of critical relationships through rigorous detective work. Rather than ask subject matter experts to list possible causes SE uses their insights to develop a strategy to force the parts to reveal their differences.

Although SE techniques are statistically rigorous, graphical analysis keeps the statistics in the background and encourages engineering insight into critical relationships.

SE tools are simple enough to be used properly by shop floor operators, yet sophisticated enough to solve highly complex problems in manufacturing quality, product performance, and product reliability. The SE technology is often favored by engineers who are comfortable with understanding how things work and appreciate the discovery of unexpected relationships. Six Sigma techniques are favored by mathematicians who are more comfortable with calculations and who seek complete models of cause / effect relationships.

In summary, either methodology will provide your company with a structured, data driven, problem solving process which produces excellent results. At TPS we teach and utilize SE. In our opinion it is a methodology that can be easily taught to many people: subject matter experts, engineers, and shop floor personnel; and it does not necessarily require a degree in statistics. This greatly increases the quantity and skill level of problem solvers, while providing them with a more streamlined problem solving process. For manufacturers we believe this is a prudent approach.

The **Statistical Engineering** method is focused preliminarily on the effect and the best way to define and measure it.
Once problems are properly defined, many problems are well on their way to being solved. Differences in the **X Prime** feature or variable ***directly*** correlate to differences in the **Y Response**.



Effect (Y Response) versus Cause (X Prime)

The pictorial shows the relationship between effect (Y Response™) and cause (X Prime™).

The goal of Statistical Engineering is to prove that high and low levels of "effect" are driven by different levels of "cause".

TPS Consultants have completed projects for more than 300 companies worldwide. Most of these projects have addressed long standing issues; all have improved the bottom-line.
A listing of satisfied clients is available upon request.

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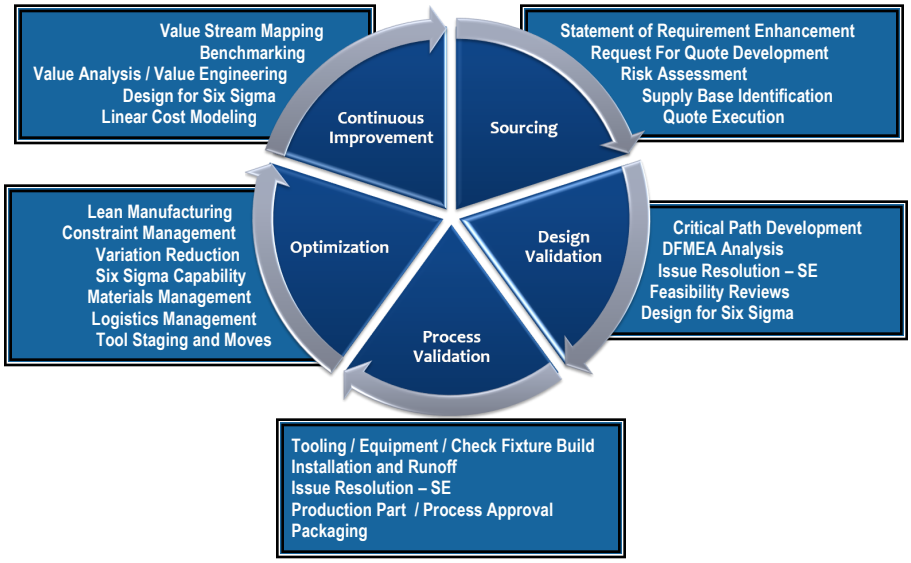
Product / Process Lifecycle Management Services

Bringing new products to the market faster and keeping them there longer requires a mastery of a variety of systems related to product manufacturing requirements, costs, critical issues, and customizability. Product Development and Supply Chain Management are inextricably linked. Nonetheless, many new products or new product designs are simply handed over to supply chain decision-makers with a vague expectation that the suppliers will "make do" with the plans to the best of their ability. The results of this disconnect can generate delayed launches, increased costs, frequent production interruptions, and dissatisfied customers.

TPS conducts a systematic assessment of your business needs and extends support for new and existing companies. Our assessment methodology includes:

- A thorough understanding of the limitations of the current processes and systems
- Prioritizing key business objectives / metrics
- Building business cases and recommending optimal solutions
- Assisting the decision-makers with their implementation roadmap

TPS can engage at any point in product or process life cycle to provide management support services. Our methodology and approach, combined with our purchasing, design, process development, and optimization strategies, have proven to be effective in a variety of industries and across an array of products. TPS will help you maintain a leadership position in your highly competitive industry.



U.S. Economic Forecast

SEPTEMBER 2012

Dr. Carl Steidtmann, Chief Economist at Deloitte Research, recently published an article on the 3rd Quarter economic forecast for the United States. His article titled, "United States: Five Reasons to Worry" highlights the structural challenges impeding economic growth:

1. The contagion effects from a European meltdown;

2. A deepening of the liquidity trap that makes the Federal Reserve's task of managing monetary policy more difficult;

3. Structural problems in the labor market due to a mismatch between the job skills, location of the unemployment, and the available job openings;

4. A sharp reduction in the pace of new business formation;

5. Private sector debt reduction that still has a long way to go. In the best of times, these problems would simply limit the pace of growth. In difficult economic times, they make the economy more vulnerable to recession.

All these issues have a significant impact on our economy. However, Dr. Steidtmann comments regarding liquidity and the structural problems in the labor market struck a chord with us. Dr. Steidtmann stated, "An increase in cash levels since the first of the year is a clear sign that the level of economic uncertainty has risen. While uncertainty over Europe has grown, so too has concern over the fiscal cliff faced by the U.S. Government, the future status of health care reform, the future role of the federal government in regulating oil and natural gas drilling, and the pace of roll out of Dodd-Frank regulations. Banks and corporations have responded to this growing level of uncertainty by holding cash. This deepens the Federal Reserve's liquidity trap."

"Additionally, the structural labor market problems have been a major drag on the economy as well. Historically, there has been a close relationship between job openings and the unemployment rate. Typically as job openings rise unemployment dips. Today, however, there is a new phenomenon. Since the first of the year, the rate of job openings has averaged 2.5% of total employment. In the last decade, that level of job openings would correspond to an unemployment rate of around 6%. However during this recovery, there has been a shift in the relationship between job openings and the unemployment rate. While jobs are being created, they don't match up with either the skills or the geographical locations of the unemployed." Thus the labor market languishes.

In this chaotic environment TPS has played an integral role in assisting organizations to mitigate these challenges. With our expertise in manufacturing and statistical problem solving we have helped many companies reduce their structural costs. And, because we have consultants located throughout the United States, we typically have the right resource at the right place at the right time.

In these difficult times we believe TPS can deliver cost effective solutions, in a relatively short period of time, to any company in the United States. So, rather than worry about our economic challenges let's collectively do something about it.

Call us at 1.248.641.1877 or visit www.techps.net to learn more.

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