SIX SIGMA BASICS – PART 1
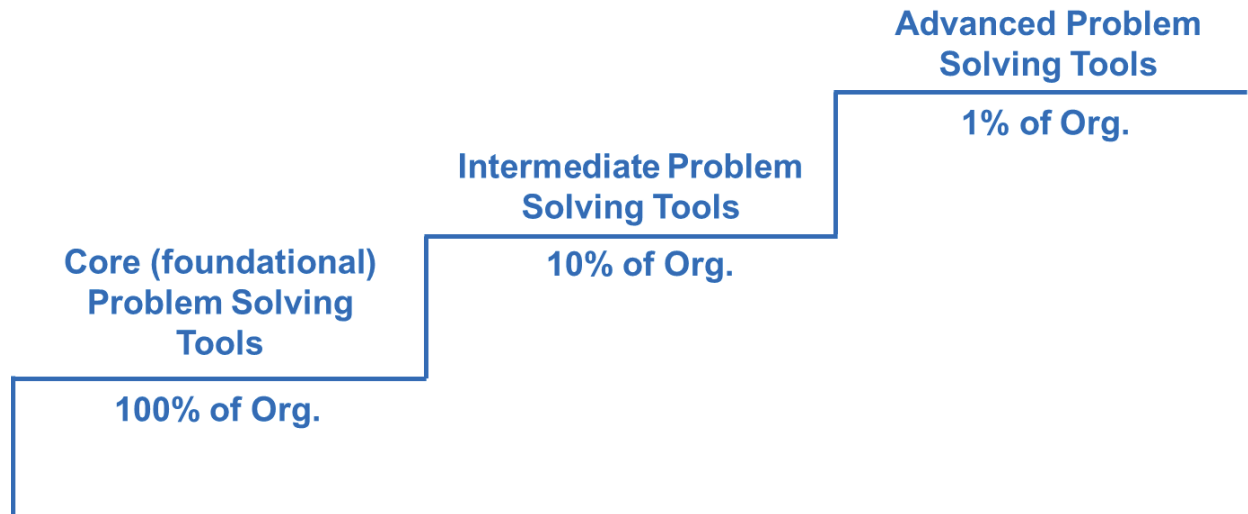
BUSINESS SYNERGY

Six-Sigma is a problem solving technique that works well with any Lean enterprise initiative. In some companies, the term "Lean Six Sigma" is used instead of separating the two approaches, since they complement each other in their goals. Lean is a system used to eliminate waste, imbalance and overburden by identifying and solving problems through the use of people. Six-Sigma can be the methodology that is used to identify key problems, validate root cause, and solve the problem properly and permanently using statistical tools. It was developed by Motorola in the 1980's and has stood the test of time. As popular as it is, there are still many companies that have not benefited from the tried and true process that has shown its value time and time again at some of the world's largest organizations. GE, American Standard, Motorola, and many other companies have attributed billions in savings to the Six Sigma business tools. Six-Sigma is not just a problem solving tool, but also a business philosophy that enables world class results to be achieved in all areas of business. The goal is to achieve customer satisfaction at the highest level. It aligns the company's actions with the needs and expectations of the customer. After all, the customer is the one that really pays the bills.

Click here for a diagram on how DRIVE describes how the Six Sigma methodology fits with the overall improvement strategy of the organization.

It is important to note that when implementing any improvement approach, such as Six Sigma, one must not do so in a directionally incorrect manner. Understanding how the methodology fits within the improvement strategy is the first step, followed by implementing the three cultural enablers in the organization. Afterwards, one can work on the tools. When creating a culture of problem solving, where every person in the organization is consistently focused on making today good and tomorrow better, it is important not to focus first on the biggest problems – at least at the front line level. We have seen too many situations where the organization is "Elephant hunting," or trying to solve only the biggest problems and not engaging the majority of the organization. We recommend a tiered problem solving method where we first start with Core Problem Solving being utilized by everyone in the organization with simple tools. When a problem cannot be solved with this method (usually about 10% of the time), we move to the intermediate problem solving tools with about 10% of our people. When those tools don't work (about 10% of the time, or 1% of the total problems), then we can solve problems using advanced techniques, including the highest level tools of six sigma. They are all important, but if we could only focus on one, we would recommend starting with Core Problem Solving first. This tiered problem solving method is illustrated below:

Aligned for Results...
The Competitive Advantage in a Global Marketplace
P.O. Box 23031, Knoxville, TN 37933-1031   Phone 865.323.3491   Fax 865.288.3304   www.DriveInc.com

Advanced Problem Solving Tools

1% of Org.

Intermediate Problem Solving Tools

10% of Org.

Core (foundational) Problem Solving Tools

100% of Org.

DEFINING SIX SIGMA

The term Six-Sigma is used to define the amount of defects, and is generally presented as parts-per-million or defective parts per million produced, (ppm / dppm). Companies usually start with a level of improvement targeted toward Four or Five Sigma (6,210 or 230 parts defective in every million produced, respectively), and progressively work their way up to a Six Sigma level, (3.4 parts defective in every million produced). (There are some companies even attempting a Seven-Sigma figure). Six-Sigma uses data and statistical tools to systematically improve processes and sustain process improvements. Process metrics are developed and monitored against expected targets. The Lean philosophy makes sure that variation is seen as evil that must be eliminated, especially when it negatively impacts customer satisfaction.

FIVE PHASES

The systematic approach within the Six-Sigma process consists of five phases. We will touch on each of the phases briefly in the introduction with more detail to come in future blog sessions. The five phases are: Define, Measure, Analyze, Improve, and Control. This is also known as the DMAIC process. In the Define Phase, a team will set project goals and boundaries based on one's knowledge of the organization's business goals, customer needs, and the processes that need to be improved in order to gain more profit, customer satisfaction, market share, etc. Some common tools used in the Define Phase are: Project Charter, Stake Holder Analysis, SIPOC, Rolled Throughput Yield, Voice of the Customer, Affinity Diagram, Kano Model, Decision Trees, and Critical to Quality Tree. The output of the Define Phase is a clearly defined project that is strongly linked to business success.

In the Measure Phase, the team's goal is to pinpoint the location or source of problems as detailed as possible by building a factual understanding of existing process conditions and problems. The knowledge gained here will help the team narrow the range of potential causes that need to be investigated in the Analyze Phase. A baseline for capability is a general output of the Measure Phase. Some common tools used in the Measure Phase are: Data Collection Plan, Data Collection Forms, Control Charts, Frequency

Plots, Gage R&R, Isoplots, Pareto Charts, Prioritization Matrix, FMEA, Process Capability, Process Sigma, Sampling, Stratification and Time Series Plots. The output of the Measure Phase is a measurable cause whether it is a variable or an attribute.

In the Analyze Phase, one develops theories of root causes, confirms the theories with data, and identifies the root cause(s) of the problem. The verified cause(s) will form the basis for solutions in the next phase of the problem solving cycle, which is the Improve Phase. Some tools that are used in the Analyze Phase are: Affinity Diagrams, Brain Storming, Cause and Effect Diagrams, Control Charts, Data Collection Forms, Data Collection Plan, Design of Experiments, Flow Diagrams, Frequency Plots, Hypothesis Testing, Pareto Charts, Regression Analysis, Response Surface Methodology, Sampling, Scatter Plots, and Stratified Frequency Plots. The output of the Analyze Phase is the link between the problem outlined in the Define Phase and the cause described in the Analyze Phase.

In the Improve Phase, one should be ready to develop, implement and evaluate solutions targeted at the verified cause. The goal in this step is to demonstrate with data that the solutions solve the problem and lead to an improvement. It is extremely important to VERIFY the solution before proceeding to the next Phase of the DMAIC process. A poorly selected root cause will cause the team to struggle in the future. The tools most commonly used in the Improve Phase are: Brain Storming, Consensus Building, Affinity Diagrams, Creativity Techniques, Data Collection, Design of Experiments, Flow Diagrams, FMEA, Hypothesis Testing, Planning Tools, Better vs. Current, and Stakeholder Analysis. The output of the Improve Phase is confirmation that the problem is being driven by the cause stated in the Analyze Phase.

The Control Phase is the final phase of the problem solving cycle. The Control Phase is designed to help one ensure the problem remains solved and that the new methods can be further improved over time. In some cases the solution can be in the form of an irreversible corrective action. In other cases, there may have to be some type of control or monitor in place to avoid problem recurrence. The tools most commonly used in the Control Step are: Control Charts, Data Collection, Flow Diagrams, Before and After Charts, Quality Control Process Charts, Tolerance Parallelograms, and Standardization.

The DMAIC process has shown its power with many projects across many industries. It is a proven method that anyone can deploy to solve an organization's most difficult problems. The satisfaction of a team solving problems that have never been solvable in the past is very rewarding and builds momentum for future problem solving efforts in the organization, ultimately leading to a problem solving organization. Join us in our next article when we deep-dive into the DEFINE phase of the DMAIC process.

Do you have long standing problems that have not been fully resolved? Do you struggle with engaging all people in effective problem solving? Are you struggling to fully satisfy customers due to quality issues and recurring problems? We offer foundational, intermediate and advanced level problem solving including practitioner certifications. For a no-obligation introduction meeting, please contact Paul Eakle at Paul.Eakle@DriveInc.com or 865-323-3491.