

## Process Knowledge: A Necessity for Six Sigma Projects

Successful closing of Six Sigma projects can be a challenge without process knowledge.

by Praveen Gupta



Companies often have numerous Six Sigma projects in the pipeline, and Six Sigma belts are busy working on projects. However, statistical thinking suggests that not all projects will be equally successful. In fact, the amount of improvement could vary significantly from one project to another.

In an attempt to understand how employees could improve the degree of success of their projects, one discovers that there's a significant focus on applying statistical tools, particularly design of experiments (DOE). Contrary to utilizing DOE as a first step, the project staff should spend time analyzing processes to gain better knowledge of the project. The more process knowledge a team or an individual has, the faster a project can be completed.

While working on projects for several years, I've come across many professionals with years of experience. These professionals believe they know almost everything: They resist to new ideas and don't want to be bothered. I remember tactfully asking one of these professionals, "If you know everything, how come your process is having problems?" The person realized then that he didn't know everything and that teamwork could help his process.

### What's process knowledge?

Based on concepts of the process thinking, process experts must be able to learn the following aspects of a process:

- *Purpose*—The most important aspects of a process. Team members must be able to articulate what the basic purpose of a process is. Is the process needed? Does it add any value? Can the project be done without the process?
- *Process description*—The process owner must be able to describe the process from beginning to end. The one responsible for the process should be able to explain key aspects of the process, measurements to monitor it and its deliverables.
- *Process details*—The process knowledge includes knowing details such as the process inputs, critical process steps, process outputs, process parameters and workmanship standards. There must be a clear understanding of the target and tolerance conditions for the process.
- *Process performance*—An important aspect of the process knowledge consists of knowing process performance at key measurement points throughout the process operation. The process performance includes knowing typical performance levels, trends in the performance and the amount of improvement. If there are visual standards of excellence, they must be clearly known.
- *Handling of nonconforming material*—In addition to knowing the good product or process output, employees working on the project must also know how the nonconforming material is handled. What kind of exceptions are made, and what is sent on "as is?" This represents the "knack" of a process.
- *Statistical performance*—In addition to the qualitative knowledge of the process, a process expert must understand the process variability and the process performance in statistical terms. Jeff Hawkins, the author of *On Intelligence* (Times Books, 2004) defines intelligence as an ability to predict. Statistical understanding of a process provides the ability to project and predict.

The statistical knowledge of a process also implies understanding the nature of variation in the process. If the variation is assignable, it's important to know how to adjust the process. If the variation is random, the expert must understand sources of variation and be able to improve the process capability to the entitlement level.

The statistical understanding must include the typical output, the exceptions and the problems experienced in the process. Typically, known measurements of a process include target, tolerance, defects or error rate (parts per million), process mean, process standard deviation and Cp/Cpk.

People gain experience from practicing the process steps, and from prior process mistakes, or by simply solving the problems of the process. The process owner must develop an ability to recognize patterns in the process performance.

Working on Six Sigma projects requires the process knowledge to make breakthrough improvement. The process knowledge is an implicit assumption. However, experience shows the importance of understanding which process knowledge must be available on the Six Sigma project team. A collective process knowledge forms the baseline for a Six Sigma project. The project team builds on the

process knowledge and delves into innovative solutions to realize significant improvement. Process knowledge is a minimum condition to successfully complete a Six Sigma project.

**About the author**

*Praveen Gupta is a Six Sigma consultant and trainer at [Quality Technology Company](#). He is an ASQ Fellow, and has been associated with Six Sigma since 1986 at Motorola. Praveen has taught Six Sigma at Motorola University for more than 10 years. He has authored [Six Sigma Business Scorecard](#) and [The Six Sigma Performance Handbook](#).*

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