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Statistical Software and Six Sigma Projects

Know your process before you know your software

by Praveen Gupta

A major misunderstanding regarding Six Sigma is its fabricated definition, (e.g. "Six Sigma is a fact-based decision-making methodology..."). I've seen people willing to attack anyone utilizing common sense to make decisions without facts. One of the reasons for taking such a strong position is that practitioners develop affinities for statistical software programs, which creates a perception of righteousness after the software gobbles down some numbers. This perception is wrong.

There's nothing wrong with the software, the Six Sigma practitioners are the ones who don't use the programs appropriately. In the Six Sigma arena, software is like a crutch—everyone gets one and then limps around with it.

During an online Six Sigma discussion forum, I once presented a hypothesis and asked for members' input. Suddenly, I received a rash of replies about how "dumb" I was for making a decision without facts or numbers. People love to talk about measurement-system analysis anytime someone uses numbers, but Six Sigma practitioners must realize that numbers don't represent the total information about an event and statistical software doesn't solve problems. Crutches can never become legs.

In my Green Belt and Black Belt classes, I've found that some people haven't been exposed to statistical software and they're a little scared of using it.

There's also the group of people who have been exposed to various spreadsheets and associated statistical functions. They're very comfortable using software. For them, statistical software speeds up analysis because the statistical software programs are optimized for Six Sigma, with faster graphics, quick analysis, and integrated and guided advanced statistical analysis.

Then there's another small group of practitioners who have mastered Six Sigma statistical software. They know the software inside-out. They love the mastery of the software as some kids love their computer games. It's fun to see their enjoyment. They practically think through it, and some may breathe through it, too. If you give them some numbers, they spit out a solution in no time while convincing you of the correctness of their solution. These people may actually be dangerous to the business, because they can initiate a process change based on software, and produce no gain whatsoever for their company. They can use statistical software to justify anything. Statistical software is their best friend.

I've been involved with Six Sigma since 1986, when I worked with its inventor, the late Bill Smith. We didn't have fancy statistical software programs then. One famous statistical program used to cost around \$30 and came on a 5¼" floppy disk. I wrote the Six Sigma calculation routine for my boss to figure out the sigma level for whatever parts per million he could think of. Today I love using statistical software for analysis because it gives me insights that'd be a little tedious to achieve if done manually. I recommend that every student learn statistical software, but I suggest becoming process experts before becoming statistical software experts first.

I've seen people performing process analysis without even knowing what the process is all about. Statistics is about correlation, while engineering is about causation. Correlation doesn't mean causation, although causation may lead to stronger correlation. Therefore, Six Sigma practitioners must gain process knowledge before they can interpret a statistical analysis correctly. Besides, statistical software can analyze the data using many techniques and produce an analysis summary that can give a false perception of one's process expertise.

With a good understanding of the process at hand, practitioners can solve many problems using statistical software. However, if there's a lack of process knowledge, it's hard to be sure of what's going on in the process, or what the statistical analysis is revealing. Process knowledge also expedites statistical analysis, because it allows for Six Sigma experts to know which tool would be effective for performing the desired statistical analysis.

Playing with statistical software is good for visualizing data. Visualization helps us internalize the data and improve our understanding of cause-and-effect relationships. It also enables us to interpret the

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data in the context of our problem, rather than in the context of the statistical software.

Playing with the process and learning about it should precede learning statistical software. With good process knowledge, Six Sigma practitioners can use statistical software to look into, refine one's understanding of, and then optimize the process. Using statistical software without process knowledge makes people statistical-software experts, not process experts. To solve this problem, it's necessary to balance the use of statistical software with process knowledge. That's a sure bet for success. Otherwise it's game of numbers— a lottery—with a similar statistical chance of success.

Six Sigma isn't a methodology driven by just facts or statistical tools. It requires knowledge of the process, the ability to use the appropriate software, good time management and teamwork. Most important though, Six Sigma requires a passionate commitment to improve processes significantly and creatively with anything and everything we have at our disposal.

About the author

Praveen Gupta, president of [Accelper Consulting](#), helps clients in the areas of Six Sigma, performance improvement and innovation. He has authored several books on business scorecards and Six Sigma. Praveen writes monthly for Quality Digest's "Inside Six Sigma."

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