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Six Sigma Tools

By Peter Peterka

Statistics are at the heart of Six Sigma's powerful methodology for quality improvement. It pays to get to know some of the most important of the Six Sigma statistical tools.

Control Charts

The control chart is the fundamental tool of statistical process control; a proven technique for improving productivity. It monitors the variation of key characteristics and indicates the range of variability that is built into a system. Control charts provide diagnostic information about process capability that can be used to analyze variation in process data to demonstrate whether a process is operating consistently. The bounds of the control chart are marked by upper and lower control limits that are calculated by applying statistical formulas to data from the process. Data points that fall outside these bounds represent variations due to irregular causes, which can then be identified and eliminated. Control charts are effective in defect prevention and will help ensure that your process performs consistently. From them, you can, in a precise manner, monitor, control, and improve on process performance over time. This will allow you to be able to predict fluctuations, lower costs and ensure the process has a higher effective capacity.

Failure Modes and Effects Analysis (FMEA)

FMEA is a powerful structured approach that helps you to identify and counter weak points in the early conception phase of products and processes. Using FMEA allows you to analyze any system or subsystem in manufacturing or service industries in the early stages of the process. This systematic methodology identifies potential failure modes in a system caused by either design or process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA improves the quality of products and services and processes by preventing problems from occurring. It documents and tracks action taken to reduce risk while it integrates with the DMAIC methodology.

Histogram

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A histogram is used to graphically summarize the distribution of a data set. A histogram is constructed by dividing the range of data into equally sized segments. This data tool enables you to quickly and easily answer several important questions: what distribution does the data have? What is the most common system response? Is the data symmetric or does it contain outliers?

Pareto Chart

A pareto chart is used to graphically summarize the relative importance of the differences between groups of data. A pareto chart is constructed by dividing the range of data into groups. The vertical axis of the pareto chart is the cumulative percentage, and the horizontal axis of the pareto chart is the groups of response variables. Unlike the histogram, the pareto chart is ordered in descending frequency magnitude. The Pareto Chart allows you to focus your efforts to achieve the greatest improvements by identifying the largest issues facing the process. It identifies the 20% of sources that are causing 80% of the problems.

<http://www.6sigma.us/>

Peter Peterka is the Principal Consultant in practice areas of DMAIC and DFSS.

Peter has eleven years of experience performing as a Master Black Belt, and has over 15 years experience in industry as an improvement specialist and engineer working with numerous companies.

Countering The False Notion That Six Sigma Is Elitist

By Peter Peterka

Too often, when people think of Six Sigma and black belts they see them as having an elitist connotation. The opinion that Six Sigma is elitist or that black belts are elitist, however, are false. In its purest form Six Sigma is a "way of life" for an organization serious about process improvement. It just happens to have certain characteristics that people like to throw stones at. That some people have come to believe this false notion is because they have misinterpreted the nature of Six Sigma and not seen the complete picture.

There is an air of mysteriousness that surrounds what Six Sigma black belts do. People experience projects where black belts are left alone to crunch numbers and work on long projects in isolated offices far from the factory floor. They wonder what exactly happens behind the scenes and not knowing, become apprehensive. This is especially true when they know the outcomes will affect them. If employees have not received any training in Six Sigma, their ignorance about the processes will lead them to mistrust and even fear the Six Sigma project and the experts guiding the project.

Other people have developed resentment toward Six Sigma consultants themselves. Certainly, there are some individual consultants who are arrogant, uncooperative, and insensitive to others. That, though, reflects on that individual and does not represent Six Sigma. There are people in all fields and professions who are not nice or have an inflated opinion of themselves. Six Sigma is not about

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self-aggrandizement. It is not about lording over people. Unfortunately, some people are more concerned with obtaining a Six Sigma certification than with appreciating what the newly acquired skills will allow them to deliver to their organization. The priority of Six Sigma training should be to deliver value to one's business and to the customers of one's business. Training to become a Six Sigma team leader gives one skills and tools, but doesn't give one a right to be elitist.

Six Sigma is about getting everyone involved. A Six Sigma project forms a team of people who work together to identify problems and develop solutions. Such teams are not elitist teams rearranging the world for everyone else to live in. These teams are serving the organization by employing the skills and tools they have learned to increase quality and reduce defects. The Six Sigma black belts who are leading these teams are likewise seeking only to lend their skills learned through training.

There are plenty of ways to fail and it is always convenient to blame the tool. If you look hard enough though, the failure is the fault of a lack of planning and training. If an organization does not plan properly and train properly, there is no doubt about the outcome of that program. If management truly has their eye on the goals and is intent on providing quality products and services, then Six Sigma can keep everyone focused and part of the team. The reality is that Six Sigma isn't glamorous and it isn't sexy. It is just plain hard work.

Countering the false idea that Six Sigma is elitist is part of ensuring the success of your Six Sigma initiatives. The best way to do that is training all members of your organization in basic Six Sigma concepts can go a long way toward taking away the mysteriousness of Six Sigma and the elitist misconception some people have. Give people the knowledge and tools they need to do the job and they will thrive. Help all the members of your organization understand what Six Sigma does and how it does it. Not everyone needs to go through all of the Six Sigma training required to reach black belt qualification, but there are simple programs you can put in place to help people learn Six Sigma basics.

If you look only to the number crunching part of Six Sigma and ignore the organizational and human side, ignorance, and the resentment that comes from it, are inevitable. Including everyone affected by the Six Sigma project and giving them information they need to understand what is going on and how they can contribute will yield dividends.

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