

Five Ways to Use Shewhart's Charts

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The many different ways of using control charts in both service and manufacturing applications may be summarized under five major headings. These five categories are arranged in order of increasing sophistication below.

The first of these is that of *Report Card Charts*. Report Card Charts are charts kept for the files. They may be occasionally used for information about how things are going, or for verification that something has or has not occurred, but they are not used in real time for operating or improving the processes and systems present. This is a valid but weak usage of control charts.

The next category consists of *Process Adjustment Charts*. Some product characteristic may be plotted on a control chart and used in a feedback loop for making process adjustments, or some input characteristic may be tracked and used in a feed-forward loop for the same purpose. In many cases these Process Adjustment Charts will result in substantially more consistent operations than was the case prior to the use of control charts. (This assumes that one will know how to properly adjust the process. In some cases such knowledge can only be gained by some of the following uses of control charts.) However, once this initial improvement has been achieved, Process Adjustment Charts simply strive to preserve the new *status quo*. The potential for dynamic and continual improvement is missing from this usage of the charts. Unfortunately, this seems to be the only usage considered in most of the articles recently published in the journals.

The third category is *Process Trial Charts*. These are charts used to analyze the data from simple experiments performed upon the process. This short-term usage of control charts is a simple and easy-to-understand alternative to the use of ANOVA and other statistical techniques. This usage is often found in conjunction with the next category.

The fourth category consists of *Extended Monitoring Charts*. Extended monitoring is the use of multiple control charts to simultaneously track several related characteristics in order to discover just which charts provide the best predictors of process or product performance. This usage will generally involve a project team with a specific mission, and is one of the preliminary steps for both the effective utilization of control charts and the effective use of process experiments. Without the constancy of purpose evidenced by extended monitoring, and without the process stability obtained by getting the process into statistical control, it is doubtful that designed experiments will be of any long-term benefit.

The fifth category is the use of control charts for *Continual Improvement*. It is rare when one can begin with this usage of the charts. In many cases, progress to this last category comes only after there has been extended monitoring, and possibly process trials run. The control chart becomes a powerful tool for continual improvement only as those involved with the process learn how to use the chart to identify and remove assignable causes of uncontrolled variation. Every out-of-control point is an opportunity. But these opportunities can be utilized only by those who have prepared themselves in advance. SPC is ultimately a way of thinking with the charts acting as a catalyst for this thought process.

Lloyd Nelson calls a control chart a "When To Fix It Chart." Ed Halteman calls it a "Has A Change Occurred Chart." Sophronia Ward calls them "Process Behavior Charts." All of these alternative names emphasize the interaction between the user and the chart, which is the secret of how the simple control chart can be the catalyst for continual improvement.

The only limitation on the use of Shewhart's Charts is your imagination. And the way to stimulate your imagination is to begin to use this powerful technique yourself.

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