Success through quality choices

In the 1920s, Dr. Walter Shewhart, a physicist at Bell Telephone Laboratories, analyzed the effects of variation on a process (no two are things exactly alike). Shewhart's method is referred to as statistical quality control (SQC). I like to refer to SQC as "success through quality choices" because the techniques are used to provide feedback on the actions people choose to meet a requirement. Shewhart's approach helps prove that if you choose to always do what you always did, you will usually get what you always got.

To help determine if a process was in control, Shewhart developed a tool commonly referred to as statistical process control (SPC). SPC is used to analyze the effects of variation on a process and to measure progress against the ideal.

Since 1924, SQC and SPC have been validated and accepted as standard ways of measuring quality. The methods are so simple that they can be taught to and applied by children as well as corporate and world leaders

Statistical process control

A SPC chart is a trend chart with upper and lower control limits and represents behavior over time. The trend could represent data such as performance measurement indicators (PMIs), weight, commuting time, bowling or golf scores or rates of return from the Thrift Savings Plan. The control limits are determined by calculating an average; upper and lower control limits are based standard deviation. Shewhart adopted three standard deviations as the practical and economical limits upon which action should be taken. If all of the data falls within the upper and lower control limits, the cause of the variation would be due to normal or common causes. If one or more data points falls outside the limits, the variation would be considered special.

Quality experts such as Dr. Joseph Juran and the late Dr. W. Edwards Deming, estimated that the majority of problems or variation in any process are due to common cause. Knowledge of common and special causes helps you to make optimum decisions. A problem due to a special cause may require little or no action, but eliminating or reducing common causes requires a permanent change to the process. Deming stated that Shewhart's genius was in recognizing when to act and when to leave a process alone.

For example, although you may always get to work on time, you will never get to work at exactly the same time everyday — which is common. However, if you were late one time because a serious accident had blocked the roads, this fact would represent a special cause. If the roads were cleared the next day, you would not need to take any action to ensure you got to work on time.

However, if you wanted to reduce your average commuting time, improving the process would require a permanent change like selecting a new route, getting up earlier each day, changing car pools or skipping breakfast.

Two types of mistakes

Deming estimated that the majority of decisions or actions based on traditional methods results in no improvement because of two types of mistakes:

Mistake 1: assuming a fact or problem was due to a special or unexpected cause when, actually, the cause was common; or

Mistake 2: assuming a fact was due to a common cause, when actually, it was due to a special cause.

A few years ago, my son started bringing home math papers with poor grades — Ds and Fs. I asked him whether the problem was due to a common cause or a special cause — I wanted to know if everyone else was having problems (common) or if it was only him (special). His theory was that is was common. When I talked to the teacher several days later, she confirmed his theory. Indeed, all the other kids were having problems. I then worked with my son to change his process for solving a particular type of math problem which solved the situation. Mistake 1 would be blaming my son for the "missed questions" when the fault was due to a process that he did not have the knowledge, power or responsibility to change. Mistake 2 would be assuming that all the kids were having problems if in reality, it was just my son.

Deming remarked that never making Mistake 1 or 2 was impossible. Deming stated that Shewhart's aim was

MOVING TOWARD IMPROVEMENT

Steps needed to improve a process

1. Identify the outcomes (facts) from a process that you want to analyze or improve.

2. Develop a trend chart consisting of at least 20-25 data points. Any type of data or facts can be used. Examples could include DFAS PMIs, weight, commuting time, rates of return from the Thrift Savings Plan.

3. Develop a control chart.

4. Analyze the chart:

a. If the process is unstable, investigate the special cause(s) and remove them if they can recur. This is best accomplished by the individuals closest to the process.

b. If all of the data falls within the upper and lower control limits, reduce common causes.

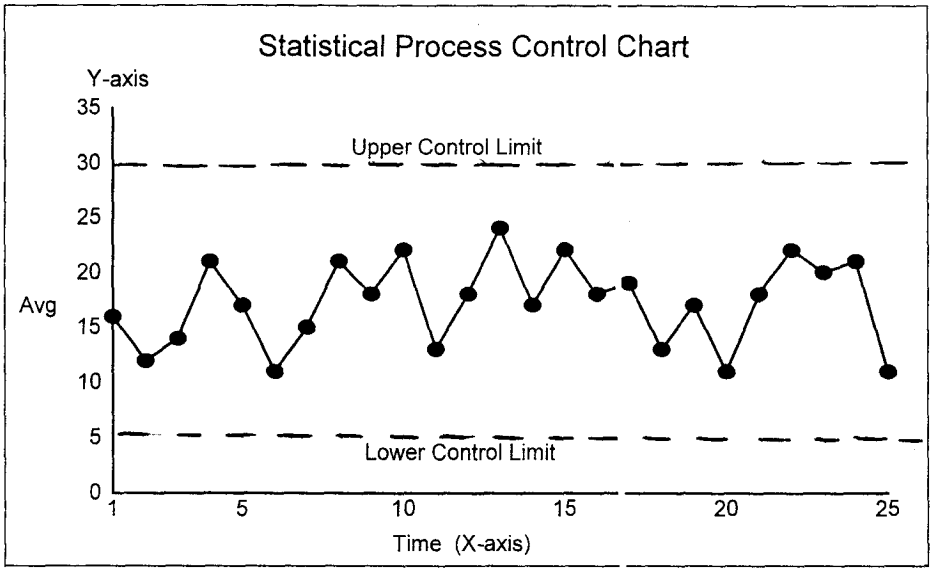
5. Reduce common causes:

a. Brainstorm some of the reasons or causes as to why the process isn't perfect.

b. Select a cause that you have the power and responsibility to change.

c. Implement the change and collect another 20-25 data points to validate if the change resulted in an improvement.

6. Monitor the process to ensure the improvement is maintained.



to regulate the frequencies of the two mistakes to achieve minimum economic loss from both mistakes. To learn how to optimize the decision-making process, a conscious awareness and understanding of variation is needed This knowledge can be developed by "plotting points."

Plotting points — your process, your data

Imagine that the SPC chart (above) represents the outcomes or results from your process. Since all of the data falls within the control limits, the process is stable. On the horizontal line (x-axis), time could represent seconds, minutes, hours, days, years, etc. The vertical line (y-axis) could represent the number or percentage of things gone right or wrong. If the ideal is 35 (y-axis), you can safely draw the conclusion that your process will have to be improved.

Shewhart's methodology represents a problem-solving or decision-making process that requires a fundamental change in thinking. Traditionally, we have been trained to make decisions based on "gut feelings" or on a relatively few hard or soft facts. This process requires people to first determine if the fact or problem is due to a common or special cause. This knowledge becomes the new foundation for making "gut-level decisions," which can only be developed by plotting points. Developing a knowledge and understanding of variation will change the way you look at the world forever and can lead to unprecedented levels of quality.

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