Help! I'm Out of Control!

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Using statistical process control in supply management

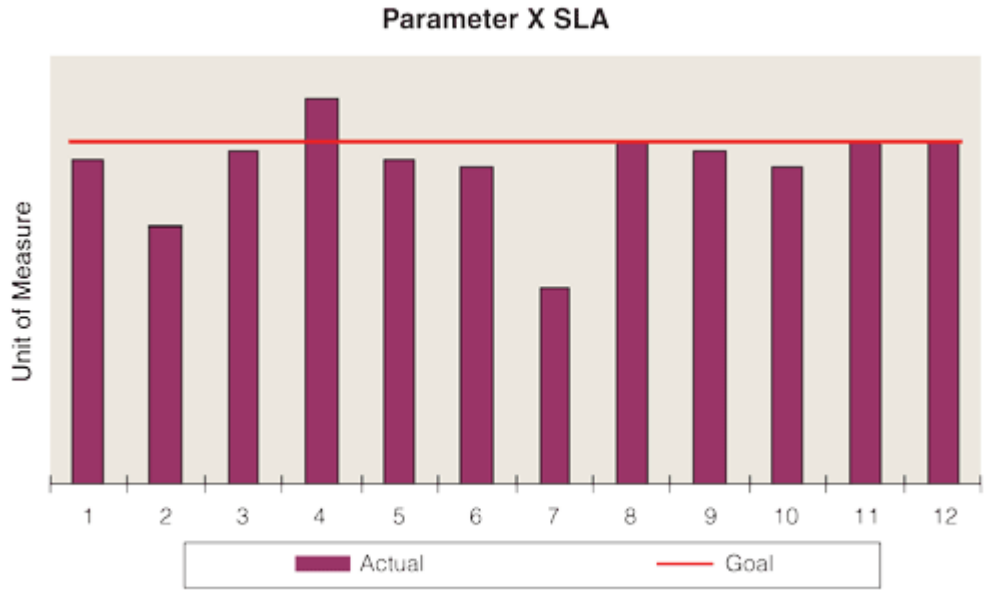
After your organization has completed a major strategic sourcing initiative, how will the service level agreements (SLAs) be tracked? Is simply achieving the SLA each month sufficient? What about month-to-month variability of the SLA — is that important?

This article will not rehash SLAs; rather, it will be a discussion of an old tool (the statistical process control chart, or SPC) and how it can be used to monitor SLA performance.

Though associated with the Six Sigma toolkit of the '90s, the SPC tool has been around since the 1920s when Walter Shewhart, Ph.D., of Western Electric's Hawthorne Plant in Chicago pioneered its use.

Applying SPC to Telecom Supplier Management

Even though SPC is not a new tool, it was recently shown to a telecom supplier for its relationship to SLA measurement and was received with open arms. During a performance review, the supplier expressed pride at meeting the SLA requirements in place for months in a row. The data looked as follows:



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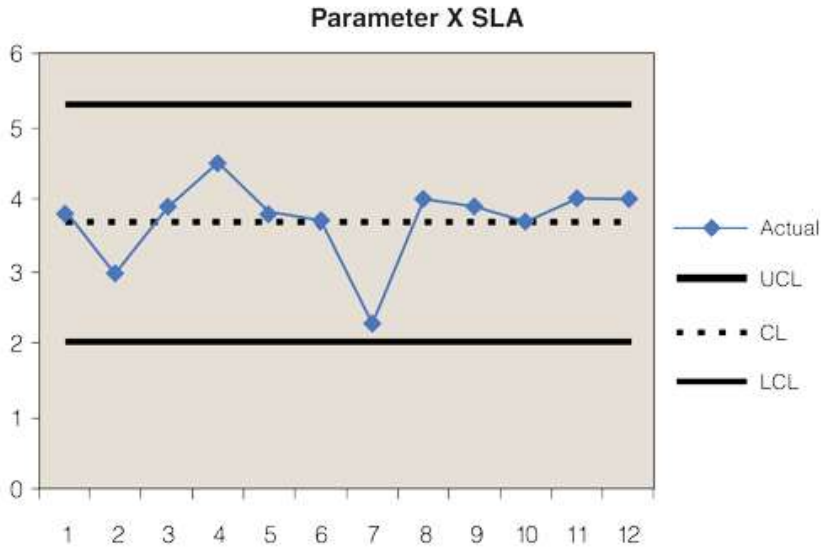
Surprisingly, the supplier management team admonished the supplier account team for their cavalier attitude. Yes, the SLA had been met — but only from a perspective of averages. As supply management professionals, our customers do not experience averages; they experience individual data points. They feel the pain when the telecoms take them down and isolate them from the core network.

Here is an example of the same data in an SPC chart:



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At a glance, the data appear to be little more than a line chart with extra lines, yet these extra lines let us interpret the quality of the parameter being tracked. They represent upper control limit (UCL), lower control limit (LCL) and the centerline (or CL, also called average or mean). All are derived from statistical analysis being tracked on the SLA. Think of the SPC chart as a line chart with a global positioning system.

SPC Provides Insight to Variability and Averages

The SPC chart provides commentary on the variability of the data. The degree of separation between the upper and lower control limits reflects the variability of the process.

As variability is taken out of the SLA, or as the SLA becomes more stable, the UCL and LCL start to converge. This is the goal as it relates to variability. Customers of the SLA get a better sense of the data's month-to-month variability.

Applying the SPC chart to SLA measurement is critical because it deemphasizes management by averages. If an SLA is X hours, and the average of the SLA for the given month comes in at X hours, then approximately 50 percent of the data points are likely to have exceeded the average. But customers, line-of-business partners and downstream operations do not feel or experience averages; they experience actual data points. As a result, some effort must be made to manage based on all data, not just averages.

Again, periodic variability is SLA delivery's enemy. Regardless of reporting period, movement of the SLA from period to period must be reduced. As process improvements are made, the SPC chart shows how that reduction in variability manifests.

With control limits in place, it is clear how variability is being impacted. When the UCL and LCL converge, it indicates improvement. As they converge and variability is removed, the process becomes more predictable. In some cases, a greater degree of SLA predictability lends itself to better planning and forecasting of budgets.

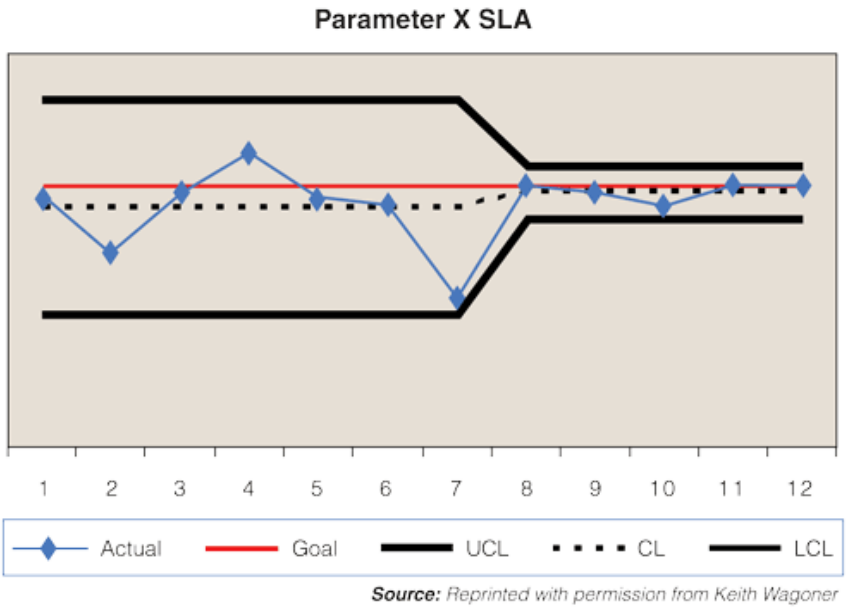
For example, a call center might use voice recognition (VRU) software with an SLA that dictates only X calls per day will be dropped. If the number of dropped calls is 10X, additional staffing is necessary. This raises the cost per call from pennies to dollars.

External customer satisfaction might likewise suffer. Depending on where the call drops, a customer might have to repeat all the information into the VRU. Now the customer's time investment in the call has doubled.

Using UCL and LCL as a roadmap also signals when the extra expense of root cause analysis is necessary.

As long as data fluctuates between the UCL and LCL, the process is exhibiting random variation, or *noise* — the normal, inherent variation of a process. Because there is no assignable cause to the data movement, random variation never necessitates the identification of a root cause. To maximize the available resources for problem-solving, only initiate root cause when control limits are violated, when seven data points are in the same direction or when seven consecutive data points are on either side of the centerline.

The following SPC chart demonstrates that improvement has indeed taken place:



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Though there is no real movement away from the goal, variability has been reduced. As variability is reduced, so is the tendency to produce SLA numbers that exceed the target. In this example, as the UCL moves closer to the target, the likelihood is reduced of having a month in which the SLA exceeds the goal.

Now, refer back to the supplier review that went awry when addressing the telecom supplier's SLA measurements. All the major telecom suppliers were subsequently trained to use the SPC tool. To senior management's surprise, they adopted it with open arms.

The SPC chart is a very simple tool which can drive disruptive change. A few final thoughts:

- Just do it. Start simply, but start.
- It is amazing what you get simply by asking.
- Be pragmatic — no need to be a purist.
- Do not let Six Sigma gurus bog you down.