Auditing X and Y Correlation

BY DUKE OKES

Auditing for compliance is important, but don't neglect the results of the processes.

AUDITS ARE INTENDED TO ASSESS the degree to which management controls comply with requirements. Many of the requirements are external in origin (e.g., standards, regulations, and contractual requirements) and others are internally developed policies, procedures, and targets (e.g., product specifications and process objectives).

It is important for auditors to recognize that these requirements include not only activities (the X variables), but also outcomes (the Y variables). Although focusing on compliance of activities is important, so is the need to look at results.

Perhaps more important is the need to look at whether there is correlation between the two. Figure 1 shows four possible states in which X and Y can be found during an audit. Auditors often assume that either the lower left or upper right are what they will find. That is, if people follow procedures, outcomes will be acceptable, and if procedures aren't followed, outcomes will not meet requirements.

However, note that there are two additional combinations, each of which also may occur and which should call for more in-depth study of the process being audited:

➡ Procedures are being followed (X is OK), but results aren't what is expected (Y is not OK). This might indicate a lack of understanding of what variables are most important, of cause-and-effect relationships between those being controlled, and/or inadequate validation of the process.

➡ Procedures aren't being followed (X is not OK), but results are as expected (Y is OK). This might also indicate a lack of understanding cause-and-effect relationships or that the process is more robust than originally thought. Two potential changes might be made: relaxing the controls to what actually works or tightening controls to improve process capability.

One must, of course, take into account any potential time lag between X and Y so that the activities performed at a particular time can be related to the right outcomes. For example, results of welding a girder or the painting of a steel beam may not be known until several hours or days after the weld has been made or the paint has dried. Regardless, if X and Y are uncorrelated, there may be significant opportunities for learning.

Whether one begins by looking at X then checks Y or starts with Y and looks at X perhaps is an issue to consider. By beginning with Y it is known that any relative time lag has already occurred, and the X factors present at the time of creation of Y can then be assessed. This is what occurs when one is performing root cause analysis. However, if the X must be observed as it occurs to get an accurate assessment, then evaluation of the Y must be delayed.

Organizations often only learn about process failures when a customer complains, and then they perform an investigation of X and Y relationships. Audits can be a proactive way of doing this, but only if correlation is evaluated rather than simply assessing the X and Y factors independently. For situations where Y can be effectively evaluated during an internal audit it will allow correction, root cause analysis and corrective action to be taken before the customer is impacted—in effect providing a faster learning cycle for the organization. **MSC**

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Figure 1: Possible outcomes based on two discrete variables.

Procedures followed?		
Outcomes acceptable?	NO	YES
YES	Also possible	Assumed
NO	Assumed	Also possible

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