Beyond Lean Six Sigma

Why lean and Six Sigma deployments fail and what you can do to do to resolve the issue

by Forrest W. Breyfogle III

Know anyone who has been laid off because his or her organization's lean and Six Sigma deployment was downsized or eliminated? My bet is that you do. Maybe you've been the victim of a process-improvement deployment shrinkage or elimination issue.

What happened? What can be done to resolve this issue?

But before answering, it's important to assess the past and determine what might be done to resolve the problem.

A historical examination

Everyone knows that organizations must improve or they will not survive. Over the years, many organizational programs have been created to address this need—using methods such as total quality management, quality circles, Six Sigma and lean. One general commonality statement that could be made about these organizational-betterment approaches, however, is that the deployments have not survived or met leadership's expectations.

In addition to improvement programs, there have been business management philosophies described by gurus such as W. Edwards Deming, Joseph M. Juran, Philip B. Crosby, Peter Drucker and Armand V. Feigenbaum. In organizations, however, there is typically a disconnect between each of these

management approaches and what is actually done in an organization. For example:

1. The commonplace measurement issues described in Deming's red bead experiment[1] are fundamentally the same as the red-yellow-green scorecard reporting method commonly used in organizations. In both instances, an individual measurement can trigger firefighting a specific event for causation, when what is needed is a collective examination of data to determine what should be done differently to enhance an organizational process. That is, in the red bead experiment and red-yellow-green scorecards, an individual common-cause process variability measurement can experience a reaction as though it were a special-cause condition.

2. Management by objectives (MBO) and goal setting throughout an organization can lead to unhealthy, if not destructive, behaviors. An example of how this management approach can lead to bad behaviors is Wells Fargo's fake account scandal.[2]
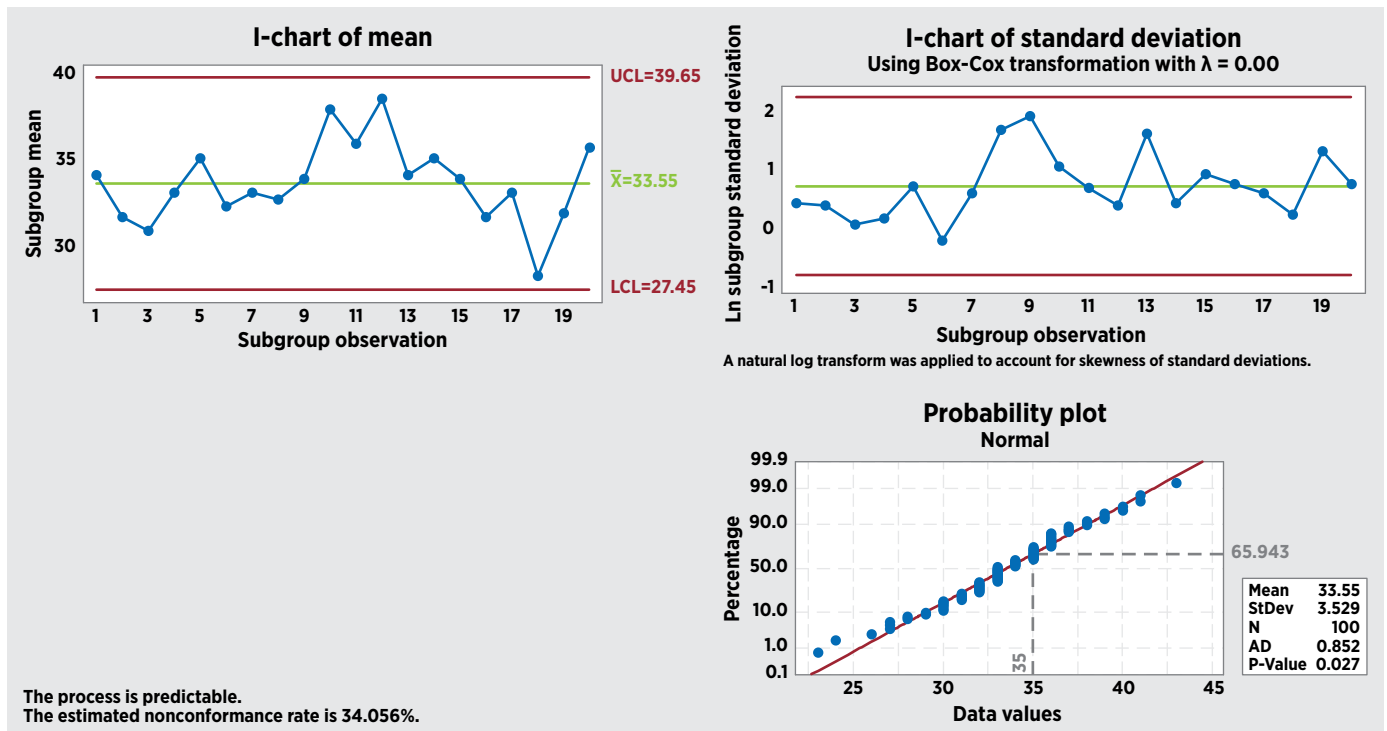
Lean and Six Sigma deployments

Current lean and Six Sigma deployments typically start with the best intentions and can initially provide benefits. After a program kick-off, leadership could identify areas that need improvement—from which some low-hanging fruit successes are achieved through the implemented method. In time, however, leadership's interest in these programs declines, and plans often evolve to practitioners hunting for improvement projects to execute.

With a Six Sigma deployment, you may have tracked financial benefits noting a reported $100 million in savings; however, no one can seem to find the money. With a lean deployment, the organization may have made a statement about a reduction of waste through the execution of many *kaizen* events. Often, however, no one can describe how these lean efforts positively affected the enterprise-as-a-whole performance metrics.

IEE scorecard: key performance indicator (KPI) response

I-chart of mean — UCL=39.65, X̄=33.55, LCL=27.45

I-chart of standard deviation — Using Box-Cox transformation with λ = 0.00

A natural log transform was applied to account for skewness of standard deviations.

Probability plot — Normal — 65.943

Mean	33.55
StDev	3.529
N	100
AD	0.852
P-Value	0.027

The process is predictable.
The estimated nonconformance rate is 34.056%.

IEE = Integrated Enterprise Excellence

Long-lasting process improvement deployment

What is lacking in most process improvement programs and business management systems is a structured link between the organization's business management system and its improvement efforts. This shortcoming could be overcome with an operational excellence (OE) deployment aligned with Wikipedia's definition of OE:

"Operational excellence is an element of organizational leadership and organizational intelligence that focuses on meeting customer expectations, all while stressing the application of a variety of principles, systems, and tools toward the sustainable improvement of key performance metrics."[3]

In general, traditional process improvement efforts have not been aligned with the last six words of this OE definition—"sustainable improvement of key performance metrics." Achievement of these last words and an overall statement in this OE description in a process improvement deployment can connect process improvement efforts with the overall business management system.

To achieve this OE definition, however, two events must occur:
1. Performance measurements must be reported from a process point of view.
2. A structural link must be established between performance metrics and the processes that created them.

## OE need No. 1: Performance metric reporting from a process point of view

Traditional scorecard report-outs can be quite different. Organizations may focus on one or more of the following report-out formats:
+ Red-yellow-green scorecards.
+ Table of numbers of many measurements in a single spreadsheet format.
+ Time-series tracking of several measurements in one chart.
+ Pie chart presentations.
+ Bar chart reporting offering comparisons to last month's or

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FIGURE 2

IEE scorecard: key performance indicator (KPI) response

Before and after process change

The current process is predictable.
The estimated nonconformance rate is 0.0577%.
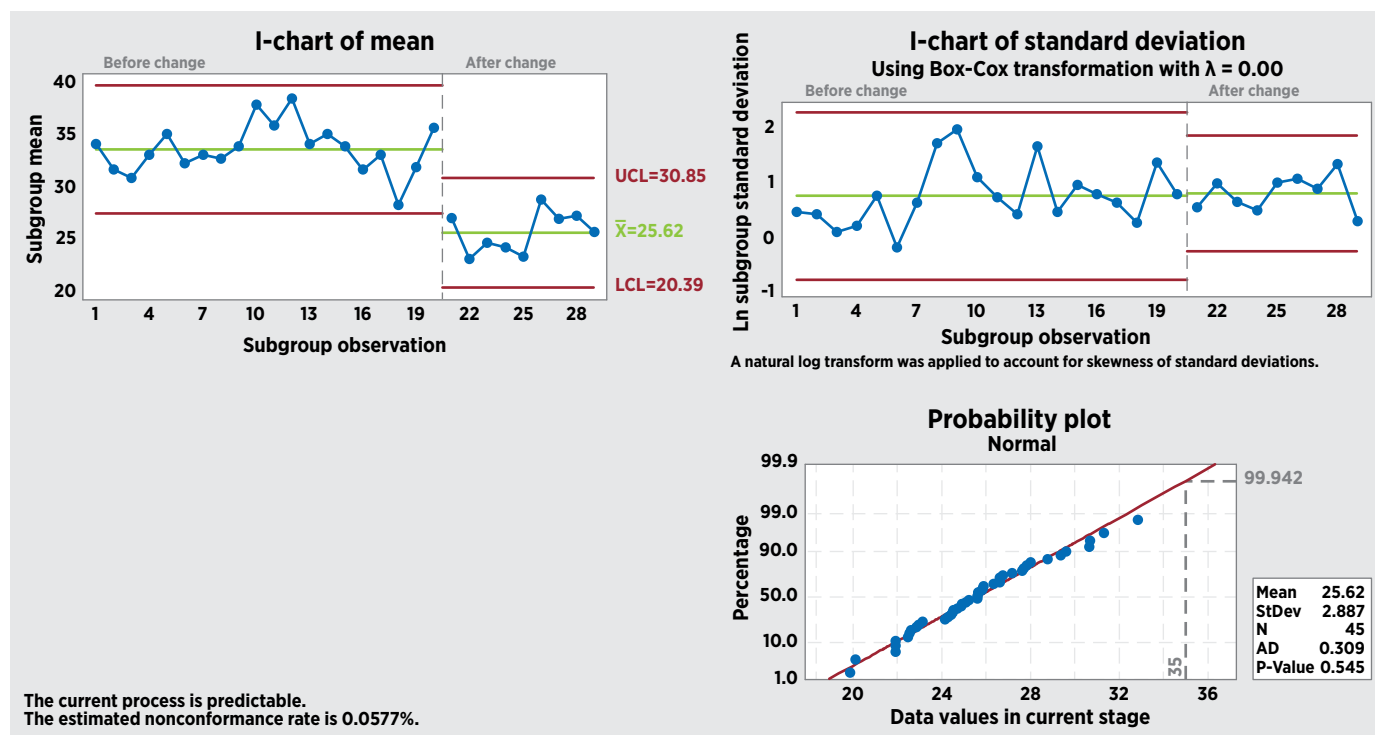
IEE = Integrated Enterprise Excellence

FIGURE 3

Hospital IEE value chain

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last year's performance.

Even though these reporting formats can appear to be quite different, they have one thing in common: Performance measurements are not reported from a process point of view. These reporting formats do not structurally include process variability so you can easily identify—from a high-level point of view—whether common-cause variability is prevalent or a special-cause condition has occurred.

The separation of unusual events from common-cause process noise variability can lead to actions that are quite different from those generated from traditional metric report-outs:

+ If common-cause variability is occurring and the response is undesirable, enhancements are needed in the process.
+ A special-cause event could trigger a specific investigation to understand what changed (that is, good or bad) in a process at a particular point in time.

You might believe traditional control charts and process capability indexes can adequately separate common-cause variability from special-cause conditions; however, there are some fundamental issues with applying these traditional tools to address the needs described earlier.

A 30,000-foot-level[4-13] one-page reporting format overcomes the shortcomings of these traditional tools and also can provide a predictive statement in terms that everyone can easily understand. With a 30,000-foot-level futuristic statement, you can assess the desirably of the response. When this assessment indicates an undesirable outcome, the associated metric's process needs enhancement.

Figure 1 (p. 49) provides a sample 30,000-foot-level report. In this report-out, the top two charts assess process stability, while the bottom right chart assesses process capability. The individuals chart on the top left indicates the process mean response output is stable, while the individuals chart on the top right indicates that the process log standard deviation is stable. Because both of these charts indicate stability, you can conclude that the process is predictable. The next obvious question is what can one predict? The probability plot in the series of charts report-out provides an estimated current and futuristic 34% nonconformance rate statement relative to an upper-specification response of 35. This nonconformance rate is provided in an easy-to-understand sentence at the bottom of the single-page, three-chart report-out.

For example, consider that a 34% nonconformance rate for this process is unsatisfactory and an improvement project was undertaken. The improvement effort could have involved a lean Six Sigma define, measure, analyze, improve and control roadmap, *kaizen* event or some other approach. What's important

is that the process enhancement effort led to a demonstration and quantification of the improvement in the 30,000-foot-level charts.

The 30,000-foot-level individuals chart shown in Figure 2 indicates that a change occurred, in which a probability plot of the raw data from the recent region of stability (for mean and log-standard-deviation individuals plots) provides an estimate of the new process's nonconformation rate, which is less than 1%—that is, an estimated nonconformance rate reduction from 34% to less than 1%.

This form of reporting is consistent with five of the last six words of Wikipedia's definition for OE—that is, sustainable improvement of key performance metrics. Sustainability can be achieved when the 30,000-foot-level metric is automatically updated and is part of an Integrated Enterprise Excellence (IEE) value chain.

OE need No. 2: Structured link between performance metrics and processes

An IEE value chain describes what an organization does and how it can report performance metrics from a process point of view.

Figure 3 illustrates an IEE value chain of a hospital's potential enterprise functions. The rectangles that have an arrow connection describe the primary hospital functions, while those that are unconnected identify support processes.

A drilldown of delivery of clinical

services is shown in Figure 4. In this more descriptive assessment of this operational function, the top swim lane can list performance metrics for the selected function (for example, from a quality, cost and time perspective), while the bottom swim lane can provide associated process steps and links to other functions and documentation. The IEE value chain structurally connects performance responses with the processes and their inputs that created the metric outputs—that is, Y = f (x).

In the IEE system, the sixth word from the end in the last sentence of the OE Wikipedia definition—"sustainable"—can be structurally addressed. In IEE, sustainability is accomplished through a clickable organizational IEE value chain available to those who are authorized.

Through the IEE value chain, a control mechanism is provided relative to performance metric's monitoring and access to consistent process enhancements documentation:

1. **Performance metric's monitoring**: 30,000-foot-level metrics that are automatically updated provide anyone authorized the ability to determine whether the performance of a process has degraded. Whenever degradation has occurred, corrective action can be taken in a timely fashion. Another benefit of this form of reporting is that the method can provide transparency of performance report-outs throughout the organization to those authorized.

2. **Process enhancements documentation**: New improvement-project procedures can be incorporated with other functional process documentation in a readily available, clickable IEE value chain. With this easy access to information, everyone responsible for executing the process will have a consistent description of what must be done in a process.

In addition to these benefits, the nine-step IEE OE method[14] can be used to determine which value-chain metric must be improved (for example, through executing an improvement lean Six Sigma project or *kaizen* event) so the big picture receives the most benefits from process enhancement efforts. Process owners of these strategic metric-improvement undertakings would be asking or demanding timely completion of improvement efforts that are to be executed in their area. This urgency will occur when process owners report-out the status of their targeted strategic 30,000-foot-level improvement needs to leaders in their organization on a regular basis.

IEE value chain drill-down (hospital example)
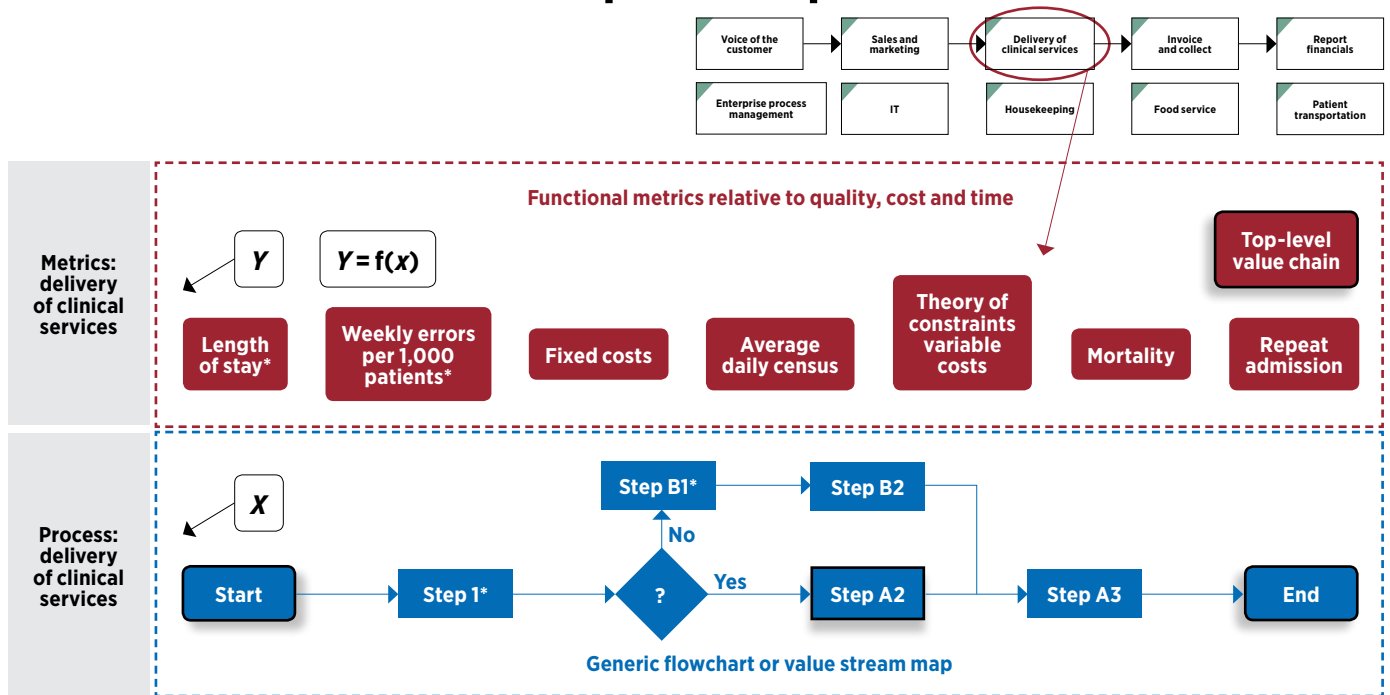
IEE = Integrated Enterprise Excellence

Enhance your organization's process improvement efforts

What could you do to assess and convey to others the techniques described in this article for your work environment? Consider the following:

1. Read John A. Daley's *Advocacy: Championing Ideas and Influencing Others*[15] (optional).
2. Determine an important key performance metric that management and others are monitoring and would like to improve.
3. Create a 30,000-foot-level metric report-out of the selected metric using a free Minitab add-in.[16]
4. Compare the traditional performance metric report-out to a 30,000-foot-level report. Describe additional insight gained through the report.
5. Share the metric report comparison study with others.
6. Ask leadership whether it would like to improve the chosen metric by executing an improvement project.
7. If a metric improvement is desired, execute an improvement project. Proof that an enhancement was made to the process is that the 30,000-foot-level individuals chart transitioned to a superior level of performance.
8. Report demonstrated improvement results to others using the newly created 30,000-foot-level chart.
9. Determine whether your organization wants automatic updates for functional 30,000-foot-level report-outs—in which this clickable reporting connects to the measurement's associated process.
10. If an automated value chain system is desired, investigate alternatives.

Sustainable improvement

Why do lean and/or Six Sigma deployments fail?

First, a measure of success for a typical lean Six Sigma deployment is how much money was saved by completing improvement projects. This financial focus can lead to discussions about how monetary savings were calculated and whether the savings were hard or soft.

A soft savings example is when fewer people are needed in an operation because of an improvement project, but these people still work for the organization in a different area.

Second, in a lean deployment, focus is given to reducing waste by operational teams—that is, often a bottoms-up organizational deployment improvement strategy.

In both deployment situations, organizations can have localized benefits. But the last six words of Wikipedia's definition are not structurally addressed—that is, "sustainable improvement of key performance metrics."

An IEE OE deployment overcomes these shortcomings and also can be used as the system for addressing ISO 9000 and Baldrige requirements.

What can you do to resolve the issue? Use data from a key performance indicator (KPI) metric to create a 30,000-foot-level report. Compare the results and expected actions from this reporting format to the traditional KPI report-out that has been used in the past. Consider implementing other steps described in this article's section, "Enhance your organization's process improvement efforts." **QP**

REFERENCES AND NOTE

1. The Deming Institute, "Red Bead Experiment," https://deming.org/management-system/red-bead-experiment.
2. Independent Directors of the Board of Wells Fargo & Co., "Sales Practices Investigation Report," April 10, 2017, https://assets.documentcloud.org/documents/3549340/Report-on-Wells-Fargo-s-Sales-Scandal.pdf.
3. Wikipedia, "Operational excellence," https://en.wikipedia.org/wiki/Operational_excellence.
4. Forrest W. Breyfogle, "Control Charting at the 30,000-Foot-Level," *Quality Progress,* November 2003, pp. 67-70.
5. Forrest W. Breyfogle, "Control Charting at the 30,000-Foot-Level, Part 2," *Quality Progress,* November 2004, pp. 85-87.
6. Forrest W. Breyfogle, "Control Charting at the 30,000-Foot-Level, Part 3," *Quality Progress,* November 2005, pp. 66-70.
7. Forrest W. Breyfogle, "Control Charting at the 30,000-Foot-Level," *Quality Progress*, November 2006, pp. 59-62.
8. Forrest W. Breyfogle, "No Specification? No Problem," *Quality Progress,* November 2012, pp. 58-61.
9. Forrest W. Breyfogle, "30,000-Foot-Level Performance Metric Reporting," *Six Sigma Forum Magazine,* February 2014, pp. 18-32.
10. Forrest W. Breyfogle, *Integrated Enterprise Excellence Volume III—Improvement Project Execution: A Management and Black Belt Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard,* Citius Publishing, 2008.
11. Forrest W. Breyfogle, "Integrating Inputs: A System to Capture and React to VOC Data Can Pay Dividends," *Quality Progress,* January 2011, pp. 64-66.
12. Forrest W. Breyfogle, "High Vantage Point Report-Outs to Reduce Risks of Organizational Problems," *Quality Progress,* December 2015, pp. 58-60.
13. Forrest W. Breyfogle, "Monitor and Manage: Diabetes Measurement Tracking at the 30,000-Foot Level," *Quality Progress,* January 2017, pp. 50-53
14. Forrest W. Breyfogle, I*ntegrated Enterprise Excellence Volume II—Business Deployment: A Leaders' Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard,* Citius Publishing, 2008.
15. John A. Daly, *Advocacy: Champion Ideas and Influencing Others,* Yale University Press, 2011.
16. A free Minitab add-in to create IEE 30,000-foot-level charts can be found at www.smartersolutions.com/30000-foot-level-add.

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