

Six Sigma for IT Service Management

Companies are continuously under pressure to prove the value of IT to the business. Information Technology (IT) was introduced to the business a number of decades ago, and the need to “Align IT with business objectives” continues to be a top priority for CIOs. To help address this, organisations have turned to practices and quality methods that include IT Infrastructure Library (ITIL), and Six Sigma – combining them to measure the quality of service, and improve IT-dependant business processes by focusing on the customers.

This article provides an appreciation of Six Sigma in IT and the techniques that have proven to work within IT Service Management. Moreover, this article provides an understanding of the difference between ITIL, the standard IT Best Practice, and Six Sigma.

Why Six Sigma?

Six Sigma is a process improvement model that enables organisations to streamline processes by reducing the number of defects. The sigma measure, σ , represents the standard deviation, which indicates the amount of variation or inconsistency in a process. The target for quality equates to six standard deviations from the mean — Six Sigma. That is, eliminate variation from a process to no more than 3.4 defects per million opportunities. For an organisation running a global email system, ½% failure rate corresponds to 10,000 email messages either lost or delayed per million items delivered satisfactorily!

Where there is variation, there is cost: according to Quality America, the industry average is operating at four sigma, which corresponds to expending 15% of revenue fixing problems. At six sigma, organisations are spending less than 5% of revenue fixing problems. This is known as Cost of Poor Quality (COPQ) — and the dollar cost of this gap can be colossal. General Electric estimates that the gap between three or four sigma and Six Sigma was costing them between \$8 billion and \$12 billion per year.

What is DMAIC?

Six Sigma’s DMAIC — Define, Measure, Analyze, Improve, and Control — is its quality improvement process, divided into phases. The DMAIC helps improve a process by focusing on the customer/end-user’s experience through Voice of the Customer (VOC) — e.g. surveys, interviews, etc. By doing so, VOC helps identify Critical to Quality (CTQ) requirements of the customers. Each of the DMAIC phases has clear objectives, tasks, and proven techniques (see Table 1).

Table 1. Overview of the DMAIC model, its key objectives and proven techniques for IT Service Management.

Define	Measure	Analyse	Improve	Control
Objectives: <ul style="list-style-type: none"> Identify Problem. Define measurable objectives and end results. 	Objectives: <ul style="list-style-type: none"> Benchmark current process performance. 	Objectives: <ul style="list-style-type: none"> Identify root cause of problem. 	Objectives: <ul style="list-style-type: none"> Recommend & implement solutions. 	Objectives: <ul style="list-style-type: none"> Sustain improvement. Predict process behavior.
Tasks: <ul style="list-style-type: none"> Brainstorm & understand impact of problem. Define process to investigate. Ensure common understanding across the project. 	Tasks: <ul style="list-style-type: none"> Collect data Identify critical to quality measures (CTQs). Baseline these measures and identify process areas that fall outside CTQ upper & lower thresholds. 	Tasks: <ul style="list-style-type: none"> Take data and analyse the process map for improvement opportunities. Root cause of problem. 	Tasks: <ul style="list-style-type: none"> Brainstorm solutions to the problem. Produce action plan 'with owners' allocated. Develop new process and pilot it. 	Tasks: <ul style="list-style-type: none"> Measure impact of improvement. Continuously monitor process performance. Take action when thresholds are breached – bring back into control.
Techniques: <ul style="list-style-type: none"> Voice of the Customer (VOC): surveys, interviews. Affinity Diagram: Brainstorming/categorising ideas. 	Techniques: <ul style="list-style-type: none"> Pareto Charts: identify key bottlenecks & prioritise improvement initiatives. Cost of Poor Quality (COPQ): impact on bottom line. Process sigma value: quality of service status 	Techniques: <ul style="list-style-type: none"> Failure Modes & Effects Analysis (FMEA): identify risk & mitigate risk through prioritisation system. Control charts: control & predict process performance behavior. Pareto Charts Correlation diagram Kepner Tregoe or Ishikawa 'fishbone' diagrams: cause & effects analysis. 	Techniques: <ul style="list-style-type: none"> Hypothesis Testing: test/brainstorm potential solutions. Cost/benefit analysis of proposed solution. 	Techniques: <ul style="list-style-type: none"> VOC Control charts Process sigma value COPQ

Aligning ITIL with Six Sigma

ITIL Best Practice activities can be easily placed within the DMAIC model. Both approaches can be used independently; however, IT executives find it beneficial to embrace ITIL and Six Sigma together. ITIL provides a set of best practices to deliver and support IT services, it does not tell the quality status of your IT service performance nor how to improve it. The techniques of Six Sigma can be applied to identify critical IT areas requiring improvement, calculate process sigma, identify bottlenecks, and test hypotheses.

ITIL also advocates the Service Improvement Programme (SIP), which is aimed at improving the quality of service from a business perspective. The SIP provides the strongest correlation between ITIL and Six Sigma as Six Sigma techniques assist with choosing a good candidate for the SIP, and then measuring its ongoing success.

Common Six Sigma techniques used in ITIL environments are VOC, Pareto Charts, Failure Modes and Effects Analysis, Control charts, Process sigma value, and IT scorecard (similar to Balanced Scorecard — BSC); measuring and reporting how well the IT organisation is performing. The techniques also show the improved quality from using the ITIL best practices.

Many of these statistical techniques seem intimidating at first; however, there are tools in the market to automate some of the ITIL processes and Six Sigma techniques.

Summary

In summary, ITIL and Six Sigma help organisations improve the quality of IT service and gain focus on the customers, thereby improving the business bottomline.

ITIL and Six Sigma are complimentary to each other; ITIL provides a framework for IT Service Management based on a set of best practices to manage IT services. Six Sigma gives you a proven set of statistical techniques to measure and improve service quality. Organisations already embracing Six Sigma in IT include GE, Raytheon Aircraft, Textron, Fidelity Wide Processing, Sun Microsystems, American Express, Barclays' Bank, and Bank of America.

An independent technology research firm, Forrester, comments *“For companies already in the ITIL implementation, Forrester recommends enhancements to the measurement System through the use of Six Sigma.”*¹

Lastly, some of the Six Sigma statistical techniques are well established and do not require you to be part of a Six Sigma company to use them. More importantly, you do not need to be a statistician to understand the techniques either — many tools are available to automate both ITIL processes and Six Sigma techniques.

Further Reading

- “Jack: Straight from the Gut” by Jack Welch & John A. Byrne (September 2001)
- CIO article: Six Sigma Comes to IT Targeting Perfection by Tracy Mayor, June 2 2004.
- Forrester report: “Beyond ITIL: Despite Hype Full Implementations Are the Exception”, Giga Research (Forrester), Thomas Mendel, October 2003.
- White papers: <http://www.proxima-tech.com/products/whitepapers.jsp>

¹ “Beyond ITIL: Despite Hype Full Implementations Are the Exception”, Giga Research (Forrester), Thomas Mendel, October 2003.