Applying Six Sigma to Internal Audit

A practical approach
Prologue – What is Six Sigma?

- DMAIC
- Master Black Belt
- Control Charts
- Fishbone Diagram
- FMEA
- Standard Deviation
- Normal \( \sigma \) Variation
- \( \chi^2 \)
- DFSS
- Green Belt
- Champion
- Certification
- Black Belt
- Special Cause
BIG IDEAS in Six Sigma

• Commitment to using statistical analysis of data to drive decision-making

• Prefer quantitative measurement to pseudo-quantitative aggregation of qualitative measurement
Six Sigma and Audit - Connections

• Using Six Sigma Tools ON your audit process
  (Six Sigma Audit Efficiency)
• Using Six Sigma Tools IN your audit process
  (Six Sigma Audit Effectiveness)
• Auditing Six Sigma organizations / activities
Six Sigma Audit Efficiency: Deliverable Analysis

• Identify critical audit deliverables
• Perform S-I-P-O-C analysis on those deliverables
Six Sigma Audit Efficiency: Process Mapping Analysis

- As-is process map:

- Analyze process map to find:
  - Bottlenecks
  - Value-Added / Non-value-added / Required steps
  - Opportunities for defects
Six Sigma Audit Efficiency: Simulation

- Conduct time study on process steps
- Identify variation in task performance
- Leverage simulation to understand overall process variation
Six Sigma Audit Effectiveness: Scoping Audit Jobs

• Pareto Principle: 80% of effects are produced by 20% of causes
Six Sigma Audit Effectiveness: Identifying Root Causes

• “Fishbone Diagram” produces visual depiction of root cause analysis
Six Sigma Audit Effectiveness: Prioritizing Risk

• FMEA (Failure Modes and Effects Analysis) quantitatively assesses risks based on:
  – Severity
  – Likelihood
  – Detectability

• Application of FMEA, together with Pareto analysis can drive effective audit practices, focused on the “critical few” risks
Six Sigma Audit Effectiveness: Statistically Sound Sampling

• How many data points do you need for a “statistically sound sample”?

• Do you “feel lucky”?

• Revelation – sampling strength and efficiency are not incompatible
Six Sigma Audit Effectiveness: Monitoring “In Control” Processes

• An “in control” process will still generate exceptions

• Appropriate action plans must take into account normal variation and distinguish it from “special cause” variation
Auditing Six Sigma

• Six Sigma programs represent a significant investment and usually a strategic commitment by management

• Audit must provide assurance that the programs are delivering appropriate return and not being diverted by the BIG RISKS of Six Sigma Programs
  – BIG RISK #1 – Weak ROI
  – BIG RISK #2 – Drive wrong decisions
Auditing Six Sigma ROI

Audit can provide independent assessment of Six Sigma ROI by analyzing:

- Program emphasis on results vs. “certifications”
- Ongoing accomplishments of trained associates
- Project selection approach/focus
- Result replication
Auditing Six Sigma Accuracy

• Effective audit will often require outside SME
• Statistics and tools can obscure truth
• In every Six Sigma program, there will be volumes of data, BUT the results will be driven by:
  – Model assumptions
  – Measurement system design
  – Variable inclusions/exclusions
• Local optimization can mask global inefficiency
Conclusions

• Six Sigma is a powerful approach to problem solving

• Audit organizations should embrace Six Sigma tools to improve their process efficiency and effectiveness
  – Develop Six Sigma skillset within audit, OR
  – Bring in Six Sigma expertise to jumpstart improvements and accelerate gains

• Auditing Six Sigma functions can be tricky and may require SME to wade through the sea of tools and techniques
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