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Six Sigma Seeks Perfection

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*Developed by Motorola Inc. (**www.motorola.com**) in the 1980s as a problem-solving, defect-reduction methodology, Six Sigma changes business cultures.* Its goal is reducing defects to 3.4 per million opportunities presented—be that on a production line or in some other endeavor. General Electric (**www.ge.com**) defines an opportunity as a chance for not meeting required specifications.

According to the U.S. Army Business Transformation Knowledge Center (Army BTKC, **www.army.mil/ArmyBTKC/focus/cpi/tools3.htm**), Six Sigma does five principal things.

It emphasizes the need to recognize opportunities and eliminate customer-defined defects. It recognizes that variation hinders ability to reliably deliver high-quality services. It requires data-driven decisions and incorporates a comprehensive set of quality tools under a framework for effective problem solving. It provides a highly prescriptive cultural infrastructure to effectively obtain sustainable results. And, when implemented correctly, it promises and delivers substantial improved operating profit.

Train black belts

In the mid 1990s, under the leadership of Jack Welch, GE embraced Six Sigma, notes Forrest W. Breyfogle III, founder and chief executive officer of Smarter Solutions Inc. (**www.smartersolutions.com**), an Austin, Texas, consulting firm. “As part of the GE Six Sigma system, there was practitioner and management training.” The Black Belts, highly trained practitioners, learned DMAIC, a business-improvement process or road map. It stands for define, measure, analyze, improve and control—and spells out clearly what is expected of

business-improvement teams. For existing businesses, DMAIC is the central philosophy.

“Project status reports were to have road-map alignment. The primary deployment success measure was money saved,” says Breyfogle. Within the past decade or so, when Lean Manufacturing waste-reduction techniques were added to DMAIC’s roadmap, “deployments became known as Lean Six Sigma,” he adds.

In DMAIC’s define phase, users scope the project at hand and create a charter, says Breyfogle, author of the three-volume “Integrated Enterprise Excellence” series, published in 2008 by Citrus Publishing, which focuses on going beyond Lean Six Sigma. Through the scoping and development of the charter, the project team and sponsors agree on what the project is and what it should accomplish, the Army BKTC indicates.

Then, in the measure phase, an execution plan is created. That involves establishing a baseline project metric “at the 30,000-foot-level,” as Breyfogle puts it. That also means conducting, as appropriate, a value-stream analysis and/or measurement-systems analysis, he notes. Creating a flowchart to describe the existing process and its execution variations is an additional step, he adds. Also, “capture wisdom of the organization (WOTO) thoughts/risks/improvement ideas through a cause-and-effect diagram, cause-and-effect matrix and failure mode-and-effects analysis.”

In the next phase—analyze—hypothesis testing with data-visualization techniques is used to gain insight into the importance of WOTO process-improvement theories, Breyfogle explains. Techniques could include regression analysis, analysis of means, variance components, multi-variable charts and marginal plots.

In the improve phase, which follows, appropriate design-of-experiment techniques are used for process-improvement-opportunity identification, he states. If Lean Six Sigma is being employed, then Breyfogle indicates use of a Kaizen event, 5S, Poka-yoke and plan-do-check-act. Also, end-users may structurally create/implement innovative ideas and statistically describe project

metric improvements.

Finally, in the control phase, participants consider pre-control charts and create a control plan, Breyfogle notes. And in this final phase, the team transfers process-enhancement ownership to the process owner.

Some things obstruct pursuit of Six Sigma perfection, though. One major Lean Six Sigma deployment problem Breyfogle notes is sustainability, which occurs because “the system typically becomes a hunt-for-project-to-execute environment; e.g., find a workshop project for a trainee.” And even though the DMAIC project road map can be beneficial, the push-for-project-creation system created in that environment often leads to silo-organizational projects that don’t benefit the business, he cautions. “Projects can be answering the wrong questions relative to a targeted effort for increasing total revenue and profitability.”

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About the Author
Forrest Breyfogle, III
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In a professional career spanning over a quarter century, Forrest Breyfogle has established himself as a leading edge thinker, a prolific author, an innovative consultant, a world-class educator, and a successful business executive. His work is documented in eleven books and over ninety articles on the topic of quality improvement.

A professional engineer, Forrest is also a member of the board of advisors for the University of Texas Center for Performance Excellence. He is the founder and CEO of Smarter Solutions, Inc., an Austin, Texas based consulting firm offering business measurement and improvement consultation and education to a distinguished list of clients worldwide, including BAMA, CIGNA, Dell, HP, IBM, Oracle Packaging, Sherwin Williams, Cameron, TIMET, and TATA. He served his country on active duty in the US Army for 2 years, and has played an active leadership role in professional and educational organizations. Forrest received the prestigious Crosby Medal from the American Society for Quality (ASQ) in 2004 for his book, *Implementing Six Sigma* (second edition). This award is presented annually by the American Society for Quality to the individual who has authored a distinguished book contributing significantly to the extension of the philosophy and application of the principles, methods, or techniques of quality management

He is a widely recognized authority in the field of management improvement and is a frequent speaker before professional associations and businesses. His earlier work in the field of management science has been widely acclaimed. A previous book, *Implementing Six Sigma*, sold over 40,000 copies and still ranks among the top Amazon books in Applied Mathematics/Engineering Statistics and Industrial Engineering /Quality Control.

He founded Smarter Solutions in 1992 after a 24-year career at IBM. The associates of Smarter Solutions specialize in helping companies throughout the world improve their bottom line and customer satisfaction through the implementation of techniques that are beyond traditional Lean Six Sigma and the balanced scorecard methodologies. His latest and most extensive work has been in the documentation of a new system of enterprise management, the Integrated Enterprise Excellence (IEE) system, in a series of four books. IEE provides a detailed roadmap that builds on and integrates the best practices of earlier disciplines like Six Sigma, Lean, TQM , PDCA, DOE, and TPS combined with innovative analytical tools to produce improvements at the highest level of an enterprise.

In addition to assisting hundreds of major clients in the wise implementation of improvement systems worldwide, Forrest has also developed over 300 hours of classroom instruction used to train executives, managers, and Black Belt practitioners to plan for, implement, and manage IEE systems. He also leads formal seminars and workshops worldwide.

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