

# WHAT WE KNOW SO FAR ABOUT Quality Improvement

Quality improvement is a structured approach to improve processes, products or services in an organization, network or a system. The concept first emerged in post-war Japan where managers devolved decision-making powers to factor floor teams to identify – and respond – to issues of quality on production lines. The approach to continuous improvement (aka *Kaizen*) that eventually emerged focused on worker empowerment, systems thinking, and experimental methods. The results included significant increases in quality, profits and worker satisfaction.

The success of *Kaizen* spawned a variety of improvement spin-offs across the globe and industries, which added new features to the search for quality: Total Quality Management (TQM) emphasizes the importance of customer satisfaction, Six Sigma on reducing errors, LEAN on improving efficiency and reducing waste. Today, the improvement ‘movement’ features a variety of structured improvement methods, each with its own unique steps, techniques and outputs. Some of the most popular are:

- Plan Do Study Act (PDSA)
- Focus Analyze Design Execute (FADE)
- Six Sigma (DMAIC & DVAIC)
- Failure Mode Effect Analysis (FMEA)

While improvement principles and methods originated in the field of manufacturing, they are now employed in such diverse areas as banking, health care, police services, high school education, clinical counseling, and criminal justice.

The strength of improvement methods is that they build on something that already exists, are well developed, and appear to work well in a wide variety of contexts. Their limitation is also clear: their focus on improving existing products, services and processes, rather than create new ones, means that they



*Six Sigma's DMAIC cycle (Define, Measure, Analyze, Improve, Control) is a sequential and structured approach to experimenting with ways to improve products, services, systems or processes.*

are designed to generate incremental – versus significant or transformational – innovation.

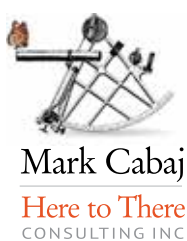
In extreme situations, improvement oriented processes can even stifle innovation. In 2006, researchers discovered that 91% of the Fortune 200 companies that had embraced Six Sigma failed to keep pace with the Standard & Poor's 500 Index. The main reason was that they spent too much time improving, refining and perfecting what they already developed, and not enough time exploring new ideas and markets. Post-It Notes, 3M's most famous product, started off as failed super strong adhesive for the aerospace industry. Their originator concluded that his invention would have not have emerged under a Six Sigma management style.<sup>1</sup>

The usefulness of improvement methods when tackling complex problems depends on social innovators knowing when to employ them. When and where a product, process, system or process is 'roughly right,' improvement methods can be useful. When complex issues require entirely new approaches, more disruptive methods may be required, such as prototyping.

<sup>1</sup> See "New Rule: Look Out, Not In," *Fortune*, July 11, 2006 and "At 3M: A Struggle Between Efficiency & Creativity," *Business Week*, June 10, 2007.

# Different Approaches to Quality Improvement

Type	Description	Key Steps
<b>Plan Do Study Act (PDSA)</b>	The simplest improvement framework organized around a constant cycle of planned experimentation	<ol style="list-style-type: none"> <li>1. Plan: develop a test</li> <li>2. Do: carry out the plan</li> <li>3. Study: assess the results</li> <li>4. Act: identify additional actions required to improve</li> </ol>
<b>Focus Analysis Develop, Execute (FADE)</b>	A variation on PDSA that includes more elaborate steps for diagnosing needed improvements	<ol style="list-style-type: none"> <li>1. Focus: define and verify the process to be improved</li> <li>2. Analyze: collect and analyze data to establish baselines, identify root cause and point towards solutions</li> <li>3. Develop: develop action plans for improvement</li> <li>4. Execute: implement and monitor plan</li> <li>5. Evaluate and begin process over again</li> </ol>
<b>Six Sigma – DMAIC</b>	A Six Sigma model for improvement which uses a highly structured experimental method to achieve a target of 3.4 defects or errors per million (aka Six Sigma)	<ol style="list-style-type: none"> <li>1. Define: describe the problem, improvement activity, opportunity for improvement, the project goals, and customer requirements</li> <li>2. Measure: create a baseline of current performance</li> <li>3. Analyze: analyze the process to determine root causes or variation, poor performance or defects</li> <li>4. Improve: identify and test measures to process performance by addressing and eliminating cause of defect</li> <li>5. Control: manage the improved process and future process performance</li> </ol>
<b>Six Sigma - DMADV</b>	A variation of DMAIC designed to create – rather than just improve – a process or product.	<ol style="list-style-type: none"> <li>1. Define: describe the problem, improvement activity, opportunity for improvement, the project goals, and customer requirements</li> <li>2. Measure: create a baseline of current performance</li> <li>3. Analyze: analyze the process to determine root causes, variation, poor performance or defects</li> <li>4. Design: create a process to meet customer needs</li> <li>5. Verify: the design performance to meet needs</li> </ol>
<b>Failure Mode Effects Analysis (FMEA)</b>	A process to identify where and how a process might fail, to assess the relative impact of different failures and those in most need of priority attention.	<ol style="list-style-type: none"> <li>1. Identify: identify the components to be evaluated, their failure mode, the effects of the failure, and the possible causes of the failure</li> <li>2. Determine: determine the probability of occurrence</li> <li>3. Identify: identify the controls to prevent or detect the failure mode, their effectiveness</li> <li>4. Calculate: assign a risk priority number</li> <li>5. Plan: identify actions to reduce risk of failure</li> </ol>



**What We Know So Far** is a series of documents that summarize some of the latest thinking or developments in the field of social innovation and community change.

## Sources:

ASQ: <http://aSources.org/knowledge-center/index.html>

Gary Klein. 2013. *Seeing What Others Don't: The Remarkable Way We Gain Insights. Public Affairs.*

Moen, Nolan and Provost. 2012. *Quality Improvement Through Planned Experimentation. McGraw Hill.*

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