Using Six Sigma Techniques in Project Portfolio Management

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Executive Summary

A very simple business model can be established that breaks down company work into either project focused work or process focused work.
1. Project work is a series of tasks to 'Improve the Business' with a defined beginning and end.
2. Process work is the series of tasks that 'Run the Business' in order to produce products the business delivers.

Over the past several years, there has been convergence of the Project Management and Six Sigma disciplines to measure and improve the process of running the business. Concurrent with the discipline implementation is an evolution of tools as well as a maturation of the organization's process. The end result is an environment in which an organization can use the tools of the Six Sigma discipline to improve the deliverables in the Project Management discipline. This article looks at five areas of using Six Sigma discipline to improve project management.

Assumptions

This article assumes that organizations have a certain level of maturity in their project management process. This "level of maturity" includes a set of standards, reusable templates, and defined "touch points" with partners. An organization might also have a well-defined methodology in which certain "artifacts" are created and shared to establish execution and control of the project. It also assumes the use of a Project Portfolio Management (PPM) tool to contain information about all projects. The tool has the capability to produce reports for all projects in the portfolio.

Current Challenges in the Project Management Process

The concept of "percentage of work complete" drives many project management methodologies and tools. While "percentage of work complete" may have a certain level of status for a given project, it is difficult to compare how multiple projects relate to each other across a portfolio. Does 60% complete of one project mean that the project is in testing, or does it mean it is in development? Have all the quality gates been completed on the project? From this we conclude that the measurements of where a project stands within a defined process are nebulous and not compared against a defined set of parameters. A portfolio management tool combined with a well defined project management process will yield an ecosystem to apply process improvement and thus project improvement.

Establish Structure

The Six Sigma DMAIC Process has five interconnected phases: Define, Measure, Analyze, Improve, and Control. The "Define" phase establishes where the critical deliverables are in a process and when they should be delivered. By default, a "Define" phase establishes a process/project methodology structure in which metrics can be gathered and analyzed.

Once there are categories and defined milestones for all projects, the PPM can be configured to support this structure and read out accordingly on a per-project basis. A well organized relationship between the PPM, the project management process, and the project methodology will drive structure to all levels of control and execution. Issues and action items will have a structure as will risk mitigation strategies and project quality criteria.

Establish Phases for Multiple Projects

Subsequently, structure establishment gives the organization a means of looking at all stages of projects across the portfolio. Instead of "50% complete" as a measure, a project needs to have x number of deliverables complete in order to change a phase. Six sigma principles will then be able to drive defect criteria for each of these deliverables and a means of collecting metrics at an artifact level.

With defined quality gates around each phase, there is a common denominator for multiple projects even with diverse project objectives.

Pareto Analysis

Another staple of Six Sigma is the establishment of Pareto analysis. Also known as the 80/20 rule, Pareto analysis is a process of grouping defect reasons into common "buckets" . A PPM can capture the data and various reasons for defects at each stage and then map them to a graph that highlights the common reasons and a cumulative percentage. This helps the organization better focus on what circumstances cause 80% of the problems.
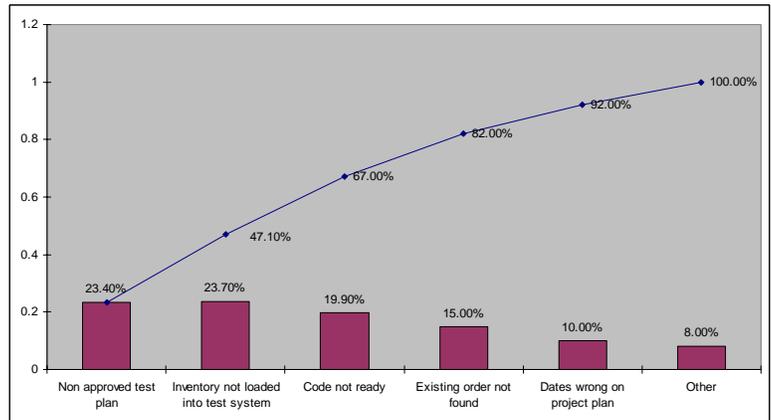

Figure 1. Pareto Chart

Six Sigma and Process Improvement

Figure 1 is an example of a Pareto chart that graphs the reasons for testing delay in a project. The arc line at the top represents a cumulative percentage. This example shows that 80% of the delays into testing are from the first 4 categories. The top categories are:
1. Non approved test plan
2. Inventory not loaded into test system
3. Code not ready
4. Existing order not found
This data can then be used on the process of approving the test plan in order to move into test.

Forecasting

Driving a structure and a process around the project management methodology enables the PPM to expand into a business forecasting tool. If there is defined structure around each milestone and what the criteria is for completing a milestone the tool can then generate a forecast of how many projects will enter a certain phase in the future.

	Lab Test	Controlled Test	Public Alpha Test	Public Beta Test	Public Introduction
September	7	2	10	2	7
October	9	18	10	8	4
November	8	14	2	11	1
December	*14*	*3*	*9*	*14*	*11*

Figure 2. Forecast

Figure 2 represents a four-month forecast of how many projects are expected to enter each phase in a given month. (For the purpose of this example it doesn't try to explain how many leave one phase and how many leave another, etc.). This information can be derived from a PPM that has the dates in one location, the dates identified as certain milestones, and a definition of how the milestone fits within the defined process.

Conclusion

Synergy is available in using Six Sigma tools in controlling project management. By having defined project phases and defined deliverables in the process, an organization can start to utilize Six Sigma to

improve their cycle times, reduce project defects, and subsequently improve overall product deliverables. It takes leadership, structure, discipline, tools, and an attitude to succeed.

Reviewer	Comment	Accept/Reject	Date
Richard			
Jim			
Collin			
Colleen		Accept	8/16/05