IMPLEMENTING AN IMPROVEMENT PROGRAM

By Neil Potter

Introduction

Implementing an improvement program can be a nebulous and overwhelming task. There are many places one could start, and many published standards one could adopt. This article provides a summary of the steps to consider when planning and tracking an improvement program.

Steps for planning and tracking an improvement program

1. Establish an improvement plan coordinator

Developing an improvement plan will require someone to be allocated part- or full-time to the activity. Some organizations form a part-time team to develop the plan (often called an Engineering Process Group). Others have part- or full-time people assigned, usually someone with project management and engineering experience.

One example that works particularly well is to have all of the project managers of the organization assigned to this role, working together to plan and track the improvement effort. This instills initial ownership over the improvements and provides an immediate audience of people to implement them.

2. Establish a management steering committee

The improvements in an organization need to be aligned with the needs and direction of senior management. Establish a management steering committee to maintain alignment and buy-in over the course of the improvement program. A steering committee typically meets every 3 or 4 months to review and approve improvement plans, receive status on improvement actions, and provide guidance on upcoming work. Initially this group can be very small, consisting of only the most willing managers.

3. Develop a plan

A. Establish plan ownership.

The plan owner should be the same person who owns the needs addressed by the plan. For most improvement plans, a project manager, program manager, senior manager, or division head are likely candidates.

B. State major goals and problems.

The core of an improvement plan is focused on the needs of an organization. The scope of the improvement plan is based on the business goals of the group. These might include delivery deadlines or the need to reduce costs, for example, "Release Killer App - Version 16 - by Dec 3rd," and "Reduce costs 10% by end of year."

Problems that prevent the achievement of each goal are enumerated, and the improvement plan is then constructed to address these problems and move the organization toward its goals. Example problems are, "There are too many features to deliver by the deadline," and "Components from the supplier are late and buggy."

This approach is described in detail in *Making Process Improvement Work*[1].

C. Enumerate improvement actions using brainstorming and a process framework.

I. Involve subject matter experts and stakeholders in the brainstorms.

II. Consider taking practices from published frameworks such as ISO9001, CMMI, or ITIL.

III. For each major improvement area, list the tasks the improvement will go through, for example:

1. Define the desired state (how the problem should look when fixed).

2. Develop a draft solution to fix the problem and achieve the desired state.

3. Review the solution with stakeholders and subject matter experts.

4. Pilot the solution 1-3 times (or until working).

5. Collect lessons learned from pilots and refine the solution.

6. Decide whether the solution is ready to deploy beyond the pilot audience.

[1] See http://www.processgroup.com/tpgbook.htm (Chapter 1 link)

7. Plan to educate the audience on the new solution. Include education tasks such as:
   I. Classroom training.
   II. Mentoring or consulting.
   III. Train-the-trainer.
   IV. Computer-based training or video.
   V. Reading books or documents followed by a proficiency test.

IV. Organize the action plan based on the goals and problems.
   1. Determine which projects will be targeted first.
   2. Highlight definite improvements that can be tracked every 1, 2 or 4 weeks.
   3. Add more detailed tasks for the improvements to be made in the first 3 months. As time progresses, add details to the plan for the next 3-month window.

D. Plan to audit the solution to maintain the gains, for example, perform audits every month.

E. Estimate the resources needed (e.g., number of hours/days) to complete the improvement tasks in the plan.

F. Assign part-time teams to work on each of the selected improvements.

G. Determine improvement plan risks and plan to mitigate.

Example process improvement risks are: people resist change, resources are too busy, and management changes focus before any improvement is finished.

H. State process improvement plan assumptions, such as: resources will have 3 hours per week for process improvement; class room training will be allowed at 40 hours per year; process documents will be stored on the company's process webpage.

I. Meet with senior management and plan owners to review and agree on the plan.

J. Publish the plan (e.g., an intranet site).

Appraisals and CMMI Gotchas
by Mary Sakry

Do you wish someone could prevent you from wasting your time and help you avoid a few hazards along the way?

There are many lessons that come from watching organizations adopt SEI CMMI and from performing numerous appraisals. This article begins a series to share the challenges and surprises that many have encountered. Hopefully this will help you avoid these pitfalls.

These lessons span all Process Areas, Maturity Levels and process improvement hazards in general.

This article focuses on Level 4 Quantitative Project Management (QPM) and two common hazards.

4. Define metrics for the goals

Improvements become more objective when they are based on measures. For example, it is easier to say that product quality has improved when there is an initial and subsequent measure of quality. Improvement measures don't need to be elaborate. Consider 2-5 measures that reflect whether the business, deliverable and improvement goals of the group are being met. These might be related to cost, quality, customer satisfaction and rework.

Scale the number of measures to fit your need. If you are in continual crises, you might just measure the number of crises per week now, and check that this number is decreasing over time as a result of the improvements being made. Assuming you are not in continual crisis, then establish a few key measures that show you where you are now and from which you can establish targets for the future. Example measures for organizations starting out are:

- #Defects released by severity
- Schedule accuracy (due date - deliver date)
- Budget accuracy (budget - expenditure)
- #Hours per week in rework and bug fixing
- #Crises per week
- %Features delivered on time compared to the plan

Add a task in the initial improvement-planning phase to establish measures. Involve the managers of the organization and the management steering committee in this effort. Plan to collect some data that can help you establish current values for these measures. Realize that your numbers might be inaccurate and need to be refined over time.

5. Decide where to store process asset and project data

Within the first few months of the improvement program, you will need a place to store process assets (e.g., templates, process descriptions, and standards) and historical project data (e.g., project name, project tasks, actual effort expended, and actual size).

Process assets are usually stored in a library on shared servers or internal company websites. Use a well-designed index page or diagram to help users navigate the library. The assets might be organized alphabetically, by discipline (e.g., project management, requirements, design, test) or by role (developer, tester, manager).

Add to your improvement plan a series of tasks for the development and maintenance of this library. For larger organizations (e.g., 100+ people) with numerous assets, this might take several weeks or months to complete. For a small group (5-20 people), a simple web page might be adequate.

Developing a database for storing and sharing historical project data is another item that should be given adequate attention in the improvement plan. The priorities in your improvement plan will dictate the time frame you need to have this database ready for use. For example, many organizations starting out will need to focus on basic project planning and estimation techniques rather than storing and retrieving data on plan estimates and actuals. However, as project management practices mature, you might decide that storing and analyzing actual project data is a logical next step to improve estimation.

Storage of project data can take a variety of forms, from well-defined spreadsheets that can be archived and searched, to relational databases that allow searches and comparisons to be performed. Whatever your solution, it will take time to design, develop, and maintain.

6. Track the improvement plan

When the plan has been approved, track it to ensure that progress is being made and identify needed corrective actions. There are two typical tracking events, a weekly or bi-weekly session with the plan implementers, and a quarterly status meeting with the management steering committee.

The purpose of the weekly or bi-weekly session is to ensure that progress is being made on the detailed improvement tasks. During the session discuss:

- The original plan (for the period past)
- Detailed accomplishments (for the period past)
- The critical path items that impact improvement deadlines
- High-risk areas that need attention (top 2-3)
- New risks
- Problems that are impacting later phases
- Status of action items (open and closed)
- Updates on measures (if any available)

The purpose of the quarterly management steering committee is to look at the major accomplishments to date and future plans. A typical agenda is:

- The original plan (for the quarter)
- Major accomplishments (for the quarter)
- High-risk areas that need attention (top 2-3)
- New risks
- Updates on measures
- Plans for the next quarter

During each status meeting, record minutes and send them to the stakeholders in the organization.

7. Revise the management steering committee

The initial steering committee membership enables progress to be made on the first set of improvements.

Over time, success stories will become known across the organization. If the improvements made so far have been valuable to the business, managers not currently involved in the effort will feel left out and want to be involved.

Summary

An improvement program can be a little bit like an iceberg. Having a list of tasks to focus on makes the effort easier to plan and manage. Use the list of tasks above to structure your improvement plan. Also, take a look at the book *Making Process Improvement Work* for further details when developing the core of the plan.

Hazard: Hoping one measure will suffice for Level 4

There is no magic! Achieving Level 4 is not about a measure or two; it's about using statistical thinking to do your work. To be Maturity Level 4, an organization must have data and perform analysis to run its business. At Level 4, managers use statistical and quantitative skills for making decisions and proactively managing the engineering work.

The essence of QPM is to select and manage the project using sub processes that are of known performance and that can achieve the project's quantitative goals. For example, if the quality target of a system is X (measured in defects), then sub processes are selected that are known to remove specific amounts of defects throughout the project. Since the performance of each defect removal process is known in statistical terms (e.g., normal range and mean performance), then the number of defects remaining in the system can be predicted in the very early stages of a project.

Projects decide which sub processes should be statistically managed and make adjustments based on current project data during execution. By knowing statistically how they should be performing, they adjust or replace their processes so that performance targets can be achieved. If the targets cannot be achieved, proactive changes are made.

Each of the selected sub processes might have different measures associated with them. Therefore, there might be several measures that are used in a Level 4 implementation.

Hazard: Expecting a statistics wizard to perform QPM for the entire organization.

Some organizations hope that they can achieve Level 4 by hiring a statistician who can perform the whole of QPM, allowing project managers to focus on their regular day-to-day tasks!

Although projects can receive help from a statistician, most of QPM is done at the project level. While performing the practices of Organizational Process Performance (OPP), statisticians will provide performance baselines, charts of expected performance, and models to make predictions. But the project managers need to be using the information and know what it is telling them. This means that the managers regularly look at and use their data to see if their performance is within known statistical limits or if there are special causes of variation to correct. It also means that managers decide if their processes are able to meet their targets or if they should seek changes.

For example: When managers notice an unusually high defect injection rate during the requirements phase, they might decide to examine requirements analysis activities. This examination might determine that they should add more steps to find requirements defects. Unlike Level 3 where this might be a guess, at Level 4, models would be used to predict the impact of adding these new steps.

Practical Solutions for your Project Challenges

❏ **Understand customer needs. Clarify product requirements early.**
This two-day workshop, IN SEARCH OF EXCELLENT REQUIREMENTS, teaches software engineers, managers, requirements analysts and user representatives how to gather, document, analyze and manage customer requirements for software applications and solutions.

❏ **Manage projects effectively. Meet project deadlines and reduce risks.**
This three-day workshop, PROJECT PLANNING AND MANAGEMENT, teaches project managers and their teams how to meet deadlines through better estimation, reduce surprises using risk management, schedule work for better optimization, understand and negotiate project trade-offs, and track progress.

❏ **Meet project deadlines. Scope and estimate the project work.**
This one-day workshop, PROJECT ESTIMATION, (a subset of Project Planning and Management) helps teams develop more accurate estimates.

❏ **Avoid schedule delays caused by needless product rework. Find defects rapidly.**
This two-day workshop, INSPECTION (PEER REVIEWS), teaches teams to efficiently find defects in code and documentation. (Includes moderator skills.)

❏ **Hands-on SEI CMMI. Perform a CMMI gap-analysis.**
The following workshops are available:
❏ SEI CMMI: Overview (half day), LEVEL 2 (one day), LEVEL 3 (two days)
❏ SEI INTRODUCTION TO CMMI (three days)

❏ **Identify critical changes to improve organizational results. Benchmark against the CMMI.**
A PROCESS APPRAISAL examines your organization's engineering and management practices and generates a focused list of the critical areas for improvement. Our SEI-authorized Lead Appraisers conduct customized CMMI-based appraisals.

❏ **Understand how to save money, produce more and work faster.**
In this workshop, DOING MORE FOR LESS, engineers and managers analyze their work activities and create a prioritized list of where time and money can be saved. A draft action plan is created.

❏ **Clarify and refine business/project measures and analysis.**
In this one-day workshop, MEASUREMENT AND ANALYSIS, engineers and managers define their objectives, measures and analysis activities.

❏ **Systematically evaluate decision alternatives.**
In this half-day workshop, DECISION ANALYSIS AND RESOLUTION, engineers and managers use a decision process to evaluate alternative choices and make a selection using weighted criteria.

❏ **Goal/problem-based improvement.**
This two-day workshop, MAKING PROCESS IMPROVEMENT WORK, provides a systematic approach for organizations to improve their development capability.
It includes: getting management support, focusing the organization on the critical issues, planning the improvement and effecting change.

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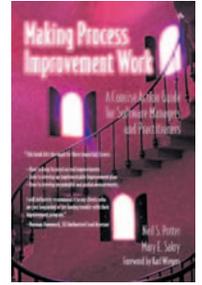*Contact us at **972-418-9541** or **help@processgroup.com** to discuss your needs.*

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