

In-the-SPIN

Newsletter of the

Boston  SPIN

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Editor: Carol Pilch

Editorial

This month's edition of *In-the-SPIN* features a SPIN Perspectives column by Johanna Rothman on project retrospective meetings and their value. Our Feature Article is provided by Donna Johnson and Judy Brodman. They describe the results of their experience in working with small organizations to apply the Software Engineering Institute's Software Capability Maturity Model (CMM). Both of these columns provide some good common sense things that can be done to improve your project's and organization's practices. And speaking of common sense, be sure to read the meeting summary for the November meeting provided by Maxine Crowther.

If you're a CMM level 1 organization trying to move to level 2, focus on making sure the folks in your organization, particularly the managers, have clearly defined roles and responsibilities. This is important because what senior management asks for is what actually gets done. An effective way to do this is to take a role-based approach to defining processes (e.g., develop a process for senior managers). So if you missed the November meeting, the summary is in this issue, and the slides are available on the Boston SPIN web site.

Consistent with the Boston SPIN charter, *In-the-SPIN* is provided by the Boston SPIN as a means of supporting the free and open exchange of software process improvement experiences and ideas. The steering committee encourages feedback on the newsletter as well as broader participation in the content and production of the newsletter. I'd like to hear from you. If you have an article you would like to publish in this newsletter, send it to carol.pilch@gsc.gte.com.

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Since January 1993

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SPIN Perspectives

This month's SPIN Perspectives article is contributed by Johanna Rothman. Johanna is President of Rothman Consulting Group, Inc. and serves on the Boston SPIN steering committee as Vice President.

Project Retrospectives

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"If you do what you always do, you'll get what you always got."



A project retrospective is the meeting at which project participants discuss what happened on the project—what went well, and what needs to be improved. The most complete retrospectives will give you information on the project's practices

and the effects of those practices on the project team and the product.

Projects Affect the System

Every project has an effect on its system—the company, the people working on the project, and the product's customers. The most valuable part of the retrospective is to start the learning process about the system.

A project retrospective can be as short as a couple of hours or as long as a few days. In general the longer and better facilitated the retrospective is, the more valuable the results are. I have found that even short project retrospectives will uncover some of the more high-impact issues with the project, such as how well the schedule was developed and used; how the product development process worked on this project; and major risks were assessed and managed.

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Meeting Summary

Notes from the November Meeting

by Maxine Crowther, Senior Quality Consultant, Cadence Systems, Inc.

Topic: “A Better Alternative to the KPA-by-KPA Approach to Process Definition and Process Rollout”

Speaker: Carrie Buchman, Vice President, Northeast Operations of Pragma Systems Corporation

If you are trying to move up the CMM levels and have chosen a KPA by KPA approach, Carrie Buchman, SPIN's November speaker, has an alternative for you to consider.

In her experience, organizations that set up teams based on KPA'S often experience several false starts. One major problem with this approach is that there are incompatibilities across the KPAs that are difficult to reconcile, if, in fact, you can identify them. So while the KPA-by-KPA approach may be easy to describe, it is hard to implement.

Carrie walked us through a typical scenario in an organization where a determination has been made to move from level 1 to level 2. The first stage is wild enthusiasm - an SEPG leader is named, charters for teams are defined, and before you know it 6-18 months have passed.

The second phase shows milder enthusiasm - a plan is formed, teams now need 1-2 full time people and the strongest team leaders are pulled off for other work. At this point we have been working for up to 2 years with nothing to show for it.

At this point disillusionment sets in - pressure intensifies for an official assessment, while processes haven't even been used. The teams are used to pilot the processes and training is done for as many people as possible and a pre-assessment is done. Now chaos reigns. Only a few selected teams are using the processes, they are not in compliance. Processes are reworked and more training is provided.

The assessment is done using other employees who are overwhelmed with how well everyone "talks" the language. The teams have been "cramming for the exam" and the assessment is positive.

In the aftermath, the pilots go back to their old processes; other projects are not interested in experiencing the pain they have seen. So, 2-3 years have been wasted and another assessment could not achieve the desired rating.

Carrie's alternative is to document processes by role instead of by KPA. An example would be the documentation given to the Quality group that states that SPQ shall perform the audit function. Since each KPA requires an audit, SQA would have to dig through all the documentation to find where and what they have to do. Instead, give them a list that includes statements like:

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Lessons Learned

When you take the time to plan and facilitate a longer retrospective, you can gather hard data such as schedule estimates and actuals, defect counts, the number of builds, etc.

Aside from metrics, longer retrospectives help you start uncovering many of the less obvious cultural and people issues. Some examples of this are how corporate managers accept bad news; or whether reviews and inspections were welcomed or dreaded by the project staff; and the effects of those issues on the people.

I recently worked with a project manager who was just not convinced retrospectives uncovered useful data. The project had just met the code freeze milestone, so I suggested we run a mini-retrospective, just to see what we would find.

What One Thing Would You Change?

I asked the question, “What one thing would you change about this project?” The project manager and I were astounded by the answers. Every person wanted to change the project manager! The project manager inadvertently made faces and complained when he received bad news. As a result, the team was no longer willing to tell him their tasks were in trouble. We realized that was going to guarantee project disaster.

The project manager asked the team to help him change his behavior. One of the project engineers made “Good News” and “Bad News” signs that were on the wall outside his office. When a team member had news for the project manager, they would choose a sign. That was the project manager’s cue to sit still and listen. Without the retrospective, the project manager would never have known he was a significant cause of project risk.

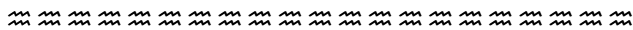


Break the Cycles

Why is this valuable? Too often, people and their organizations get caught in cyclical behavior. One example is shipping a product with too many customer-visible defects. The company chooses to ship a high-defect product. Then, there is customer pressure to fix the defects, so another short release cycle starts. Since there’s overhead for the release, not only is there bug fixing activity, but there is also tremendous pressure to add new features to the product. Since the original release plan was just to fix bugs, not enough time was spent on clarifying the requirements for the new features, or designing and reviewing designs. So, the next project has a starting point with more defects, less clear requirements, and a possibly unstable code base.

Retrospectives Help Project Observation

Put a facilitated project retrospective on the task list. Once you’ve run the retrospective, preserve the data to study on future projects. Then you can readily observe what you’ve really succeeded at now, and what you need to succeed at next.



Question: How many process improvement leaders does it take to change a light bulb?

Answer: Only one, but the light bulb has to be willing to change. And be willing to document the change!

- Audit the project plan for...
- Write a report including...
- Use these documents to assist...

Senior management would have tasks like initiate the project using a provided form, conduct reviews at these milestones, close down the project using provided form.

The big difference is the speed at which implementation can occur because interpretation of the KPAs is removed, processes look familiar and are business oriented, the learning curve is easier, and resistance is lowered. Documentation is also much more user-friendly and roll out is by project, not by KPA.

Carrie also answered questions from the audience. They have seen qualitative improvements to metrics using this approach and the speed of implementation has been dramatically improved. Because the focus has only been in place for 2 years, they are still in the process of collecting feedback on quantitative measures.

Boston SPIN Calendar

Information about Upcoming Meetings

by Johanna Rothman, Program Chair

December Meeting Announcement

Topic: “Product Development and Process Roundtables: Peer Reviews, Challenges in Testing, Requirements Management, Metrics, Process Improvement”

Speaker: All of You – Come One, Come All!!
 When: Tuesday, December 15, 1998. 6:30pm-8:30pm
 Who: Everyone (Academia, Government, Industry)

Abstract:

Do you need information about handling thorny situations at work? Could you benefit from leading edge approaches and innovative solutions for handling current project challenges? In an effort to elevate your organizational ranking from SEI CMM Level 2 to Level 3, are you in search of Lessons Learned from other survivors? Would you like feedback from the diverse backgrounds (Government, commercial, industrial, consultant) on topics related to your projected career moves?

We have had substantial interest in our roundtables, enough so that we are trying a program of just roundtables. We selected (by vote at the November meeting) five topics so far: Peer Reviews, Challenges in Testing, Requirements Management, Metrics, Process Improvement.

Dolores McCarthy will be the facilitator for the Requirements Management roundtable.

We are looking for people to facilitate the other roundtables. If you are interested in facilitating or providing input into any of the roundtable topics, please contact Caroline Starita at staritac@amp.com, 978-442-4004.

Facilitators will document the results of their discussions, and we will publish them in the In_the_SPIN newsletter.

To propose an issue, or facilitate a roundtable, please contact Caroline Starita at staritac@amp.com, 978-442-4004.

Pre-meeting roundtables will resume in January.

Location: GTE, 77 "A" St., Needham MA.

Looking for Interesting Speakers

We are always looking for interesting speakers. If you'd like to speak at Boston SPIN, please review these criteria before sending us an abstract:

Speaker Guidelines:

1. Boston SPIN looks for relevant topics facing software groups who want to improve their processes. Particular relevance to recent advances/ changes in this field are particularly welcome.
2. Preference is always given to speakers who present information pertaining to actual experiences in the field as opposed to purely theoretical presentations.
3. Our membership attends hoping to learn how they can enhance their own results. We request proven, practical detail in your presentation.
4. The presentation should be based on the presenter's personal experience.
5. If you are a vendor or a consultant, remember that the most effective presentations are those where you explain your area of expertise and show how to be effective. Please do not use your time at Boston SPIN as a sales pitch.

We developed a speaker checklist so that none of us would have to rely on our short-term memories. Please use the checklist to prepare for your SPIN talk.

Speaker checklist:

1. 60 days in advance of meeting: deliver 2 paragraph abstract, one paragraph bio to jr@jrothman.com
2. Within one week of meeting date: If desired, email copy of paper or overheads to heimann@world.std.com so that it is downloadable from the SPIN web page.
3. At the meeting: Speaker provides one copy of overheads to Charlie Ryan for our library.
4. Optional but highly recommended: bring 50-60 copies of overheads to SPIN meeting.

If you have information you'd like us to hear, please send an abstract to Johanna Rothman, jr@jrothman.com. Or, contact Johanna at 781-641-4046.

Future Program and Speaker Schedule

Date	Speaker/Topic
Jan. 19, 1999 @ GTE	Bill Silver "A Testing Assessment and Framework"
Feb. 25, 1999 Joint ASQ dinner at Holiday Inn, Newton (Thursday!)	James Bach "Good Enough Quality"
Mar. 16, 1999 @ GTE	Carol Pilch "A Tailorable Mini-assessment Method"
Apr. 20, 1999 @ GTE	Cem Kaner "Good Enough Testing or Bad Software"
May 18, 1999 @ GTE	Open
June 15, 1999 @ GTE	Open

Monthly Round Tables

What: These are focus group or "birds-of-a-feather" sessions. They provide a professional forum for sharing information and experiences, for learning about other techniques, and for finding out that you are not alone.

Do you need or want to share information about handling thorny situations at work? Do you wonder what metrics are most important? Quality, scheduling effectiveness, time to market...? Would you like to know how to manage a project that you have just been thrust into in mid stream? Could you benefit from leading edge approaches and innovative solutions for handling current project challenges? In an effort to elevate your organizational ranking from SEI CMM Level 2 to Level 3, are you in search of Lessons Learned from other survivors? Would you like feedback from the diverse backgrounds (Government, commercial, industrial, consultants) on topics related to your projected career moves?

Propose your wish list or questions as a Round Table and get your information from the movers and shakers in the software community. Round Tables are generally informal discussions, with a facilitator, to stimulate and moderate discussion.

A member of the SPIN Steering Committee will assist as Scribe for the discussion. Round Table proposals may be submitted by posting a sign-up sheet with the SPIN Steering Committee Round Table Coordinator, Caroline Starita (staritac@amp.com). Proposed Round Table sessions will be posted for sign-up prior to the monthly meeting in order for attendees to register their interest.

When: 6:30 - 7:00 PM, before SPIN Meetings

For further roundtable information, contact Carolina J. Starita, 978-442-4004 or staritac@amp.com or see the Boston SPIN web site, <http://www.cs.uml.edu/Boston-SPI>

Feature Article

Applying the CMMSM to Small Organizations and Small Projects

Co-Authors: Donna L. Johnson and Judith G. Brodman
LOGOS International, Inc.

Introduction

The Software Engineering Institute's (SEI) model for software process improvement, known as the Capability Maturity ModelSM for Software (SW-CMM), has been used by software development organizations for nearly a decade. As a result of applying the SW-CMM to their software development practices, many organizations have grown in process maturity during this time period. Most of this growth in maturity, however, has been experienced by large software organizations within large companies. The SW-CMM was originally developed for large aerospace companies and, as such, does not readily apply to the software development practices of small organizations (SOs) and small projects (SPs). As a result of this disconnect between the SW-CMM and the practices of small organizations and small projects, these groups are frequently at a loss when approaching software process improvement based on the SW-CMM.

Over the past six years, we have worked for the Air Force and private industry to identify and resolve the issues that are troubling small organizations and small projects when using the SW-CMM to achieve process maturity. We brought these issues to the forefront and then observed and consulted with over 200 small organizations and organizations with small projects to identify and develop the practices that these groups need to apply to their software development activities to meet the goals, spirit, and intent of the SW-CMM.

The following improvement activities are particularly difficult for small groups to perform according to the SW-CMM:

- Documentation - producing the large number of documents recommended in the SW-CMM.
- Training - satisfying the extensive training recommendations in the SW-CMM, establishing training facilities, and offering in-house courses.
- Project planning/tracking - planning for and tracking of the time and personnel resources required to produce the expected product.
- Software quality assurance - conducting product and process audits with limited resources, especially on small projects.

Large organizations and large projects often experience difficulties performing these activities, as well. However, these groups have the capability to overcome these problem areas with the availability of overhead resources that can be applied to the problem, as opposed to small organizations, which tend to apply all their resources to producing the product. The challenge, therefore, is to give the small organizations and small projects the tools (e.g., alternative

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outcome of that challenge — the practices and shortcuts geared for the small groups. For guideline purposes, we, in practices, shortcuts, and best practices) with which to overcome their lack of resources. This article discusses the general, define a small business as under 500 people, a small organization as under 50 software developers, and a small project as under 12 people.

Documentation

The SW-CMM refers to many types of documentation to support the software development activities of an organization or a project. For instance, Level 2 of the SW-CMM calls for 42 documents in the form of policies, plans, procedures, and recorded items. The Software Configuration Management (SCM) Key Process Area (KPA) alone suggests the production of an SCM plan, a policy for implementing SCM, a documented procedure for producing the plan, and a report on the results of Software Quality Assurance (SQA) audits and reviews. In addition to these documentation items, other SCM practices call for SCM reports, documented criteria, and five other documented procedures.

With this amount of documentation recommended for one out of 18 KPAs, small groups are overwhelmed with the prospect of producing all these documents with their limited overhead resources. The number of documents, moreover, seems unreasonable for a small organization and, even more so, for a small project with limited time and staff. For these reasons, SOs and SPs need to approach their documentation needs differently than a large organization. For example:

- documents can be combined or augmented to reduce the overhead in producing individual documents;
- memos, checklists, and email can be formalized (i.e., identified and archived) to meet documentation needs;
- reports can be generated and distributed electronically; templates can be used to save time in creating documents from scratch; and
- unneeded documentation can be eliminated with documented waivers.

Training

References to training are found throughout the SW-CMM, especially in the Ability to Perform common feature, where practices describe the training or orientation managers and practitioners need to perform their tasks. Since training is a costly overhead expenditure, small businesses and small organizations tend to hire individuals who have already been trained or have experience commensurate with the training required. The SW-CMM allows for a waiver procedure in the Training Program KPA, but most organizations are unaware of the ability to waive the training for appropriately experienced personnel, and, therefore, believe that costly training courses must be recommended for all personnel. To make matters more difficult for the small groups, the wording of the SW-CMM practices implies that an in-house training program is needed (courses created, dedicated facilities set aside, etc.).

This is not to imply that small organizations forego training for their staff; on the contrary, they can satisfy their training needs through the use of alternative methods. For example, their training vehicles tend to be informal (e.g., brown bag seminars, train-the-trainer courses, videos, satellite hookups, mentoring, and on-the-job training); they make use of

external training opportunities (e.g., university courses, seminars, consultants, and lectures); and, as previously stated, they hire experienced personnel, for whom training is not required.

Unfortunately, the vast majority of small organizations do not formalize their training (i.e., maintain records of training conducted and personnel attending training, document the training vehicles available or the steps required to satisfy required training). As a result, these organizations do not satisfy the training goals of the SW-CMM. These goals, however, can be met as follows:

- waiver procedures can be generated and the granting of waivers documented;
- procedures supporting the different training vehicles can be developed and records maintained for personnel attending training (e.g., archived attendance lists from lunch-time seminars);
- external training resources and internal training vehicles can be documented and made available to the staff;
- on-the-job training can be formalized by documenting the steps to be performed in learning the position; and
- a conference room, a vacant office, or a multi-media room can be designated as training facilities.

Project Planning/Tracking

Project planning and tracking raises many difficult issues for small organizations and projects. For example, many of these groups do not have a mechanism in place to gather and archive actual project data for use in estimating future projects. Moreover, their informal cultures often do not support the means (i.e., time cards) to track resources being expended even if they wanted to gather data.

Small organizations also take issue with the SW-CMM on the conduct of reviews. Project leaders frequently work side-by-side with the practitioners, so the gathering of status is performed as part of the work environment, thus obviating the need for formal, periodic reviews. The formal reviews tend to take place at a higher level of management in these small organizations. Moreover, for small projects, the time allotted for reviews could become disproportionate to the time allotted to development activities if the numerous reviews in the SW-CMM were conducted as specified.

To reduce the overhead of management reviews for tracking projects:

- projects can combine reviews between SQA, project management, and senior management;
- project leaders can use notebooks maintained while discussing project status as documented evidence of technical and status reviews;
- status can be captured via email; and
- documented, summary project status reported by project leads to their management can substitute for individually documented status from every engineer.

Organizations without historical data can use and document, as procedures, informal methods for generating their project estimates (e.g., task breakdowns, review of estimates by “experts”, group estimating), and, at the same time, build up

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a historical database for refining their estimates in the future.

Many organizations, particularly those involved in maintenance or on-going product releases, have difficulty even defining what constitutes a project. These organizations, for the purpose of generating a Software Development Plan (SDP), may be able to define instantiations of the same product as releases that require a planing supplement to the SDP instead of a complete SDP for each release.

Software Quality Assurance

Software Quality Assurance (SQA) reviews have a major impact on the overhead of small projects. Not only are there insufficient resources on a small project to have an SQA “group”, but the frequency of reviews required to verify all the work products and activities called for in the SW-CMM would overwhelm a small project, especially projects with short life-cycles. Moreover, independence of the SQA role is often difficult to achieve in the flat management structure of small organizations—a reporting channel outside the software organization may not exist at all, or it may mean reporting to the top levels of management in the company.

Small projects can comply with the SQA goals of the SW-CMM by combining SQA evaluations, audits, and reviews, or conducting them on a spot check basis, particularly on non-critical, short-duration projects. A spot check refers to the frequency of the review and/or audit, not its content. The fact that an activity or work product is subject to a review or audit at any stage in the process ensures that the process is followed.

With regards to the SQA “group”, many small organizations practice role-sharing of SQA and other functions or share SQA personnel between multiple projects. Independence of SQA, on the other hand, is more difficult to achieve, but if an organization can prove that it can raise issues without repercussion or retribution to the person raising the issue, then the SQA SW-CMM goal of independence is met.

Conclusion

SW-CMM practices can be interpreted in a way that expands their applicability to a wider range of organizations and, therefore, gives small organizations and small projects an opportunity to participate in the benefits of using the SW-CMM as a process improvement vehicle. There has been much discussion over the years on the problems with the SW-CMM and small organizations and projects, but the feedback from organizations applying the practices that we have described herein indicates that these organizations can finally approach process improvement with the hope of success.

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SM: CMM and Capability Maturity Model are Service Marks of Carnegie Mellon University.

Boston SPIN

The Boston SPIN is a forum for the free and open exchange of software process improvement experiences and ideas. Meetings are usually held on third Tuesdays, September - June. Boston SPIN welcomes volunteers and sponsors.

For more information about our programs and events contact:

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TO ADD YOURSELF TO THE ANNOUNCEMENTS LIST send email to ryan@sei.cmu.edu.

Send letter-to-the-editor, quips, quotes, anecdotes, articles, offers to participate in the newsletter committee, and general correspondence to Carol Pilch, carol.pilch@gsc.gte.com.

Send job postings to heimann@world.std.com.

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