

In-the-SPIN

Newsletter of the Boston  SPIN

Issue 28, June, 1999

Editor: Carol Pilch

Editorial

In this month's edition of In-the-SPIN Rick Brenner, Chair of the SPIN Nominating Committee, contributes the SPIN Perspectives column. It is an insightful and thought provoking analogy of project needs to the needs of people. In addition, I've supplied this month's Feature Article. In this article you will find more information about CMM Version 2.0, Draft C, which is being incorporated into the SEI's integrated maturity model or CMMI. When CMMI is released for public review this August, I'll be working on some informative write-ups on the status and content of CMMI and I'll include this information in future editions of this newsletter.

This issue of *In-the-SPIN*, is the last regular monthly issue until we resume publication next September. The Boston SPIN has been providing the newsletter in this format since September and the SPIN Steering Committee is interested in hearing from the SPIN membership and others who have seen this newsletter. Please provide feedback and constructive criticism to carol.pilch@gsc.gte.com

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 and broader participation in the content and production of the newsletter. If you have an article you would like to publish in this newsletter, send it to carol.pilch@gsc.gte.com

Boston  SPIN *Software
Process
Improvement
Network*
Since January 1993

SPIN Perspectives

This month's SPIN Perspectives article is contributed by Richard Brenner. Rick is a Principal with Chaco Canyon Consulting and is the Chair of the SPIN Nominating Committee.

A Hierarchy of Needs for Projects

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Projects are like people. They can be stubborn or cooperative, miserable or fun. Like people, they have needs. Unmet needs affect the project's behavior.

In *Motivation and Personality* (1954), Abraham Maslow described human motivation as a search to meet basic needs, which he organized hierarchically. In

this hierarchy, the lowest level unmet need determines motivation. Once we secure gratification of a need, the next higher unmet need dominates, and the search for its gratification organizes our behavior.

This idea raises two questions. First, can we construct a Needs Hierarchy for projects? Second, how well does that hierarchy explain project behavior? Answers to these questions could provide guidance to managers of troubled projects. The key concept is to focus management effort on the lowest level unmet need, since it dominates project behavior.

The levels of Maslow's Hierarchy of Needs range from the

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lowest level physiological needs to the highest, called self-actualization.

- Physiological** Our fundamental needs for food, water, sleep, touch, shelter, sex and exercise.
- Safety** Our needs for security, stability and freedom from fear and anxiety.
- Belonging and love** Our needs to give and receive affection, to relate to other people, family and friends.
- Esteem** Our needs for achievement, adequacy, recognition, status, appreciation, and mastery.
- Self-actualization** Our need to actualize our potential as humans. Because each of us is unique, this need expresses itself uniquely for each individual.

A Needs Hierarchy for projects might be:

- Resources** Needs for equipment, budget, people, and time.
- Stability** The need for stable requirements, stable and secure resources, stable process, stable team structure, and freedom from reorganizations.
- Business purpose** The need to satisfy a significant business purpose; to be interdependent with other projects.
- Esteem** The need to be planned and executed well; to be novel and challenging; to have prestige and status.
- Delivery actualization** The need to deliver as promised, on time and on budget; to deliver unexpected but necessary and welcome results at no additional cost.

Verifying this conjecture requires studying a number of cases, which I haven't done. My personal experience is consistent with this model. One project I recall was resource-starved. For years, we missed milestones in misery while the rest of the company ignored us. One day, resources arrived. Since we already had stability, our business purpose became a hot issue. Political attacks on our project intensified, because our vision wasn't integrated with that of the company. This seems to be well explained by a Needs Hierarchy.

The Panama Canal was a project that satisfied its need for Delivery Actualization. In delivering a Canal, it invented or extended dozens of technologies. It determined how yellow fever spreads; it invented earth-moving technologies; it pioneered central electrical control systems; it was the largest

concrete structure ever built, and would remain so for more than 20 years. For a project of seven years duration, it is remarkable that it opened six months ahead of schedule, and was 3.5% under budget. Just before completion, a delegation from the U.S. Commission of Fine Arts, sent to investigate improving the Canal's appearance, recommended that nothing be changed. Not only had the project delivered a canal, it had delivered a thing of art, "impressive from its scale and simplicity and directness." If any project ever has, the Canal achieved Delivery Actualization.

How does this model fit projects you've worked on? Can you remember a time when using this model might have helped the project? Hurt the project? Share your stories, and I'll publish the results of this "study." Contact me at rbrenner@ChacoCanyon.com

References

McCullough, David. *The Path Between the Seas: The Creation of the Panama Canal, 1870-1914*. New York: Simon and Schuster, 1977.

Maslow, Abraham. *Motivation and Personality*. 3rd edition. New York: Harper and Row, 1987.

Meeting Summary

Notes from the May Meeting
Contributed by Carol Pilch, GTE

Topic: "Performance Measurement for Software Organizations"

Speaker: Dave Zubrow, Team Leader for the Software Engineering Measurement and Analysis group within the SEI

This presentation provided practical guidance and examples for those who are currently responsible for organizational performance measurement. The guidance and examples can be used to get your organization started measuring its performance. The introductory remarks encouraged the audience to be focused on "What do I want to know?" as opposed to "What do I want to measure?" If your management asks for metrics, you have to ask "why? – what do you want to know?" It's important to start with this premise.

Dave Zubrow provided a description of what is meant by organizational performance measurement: *Quantitative* characterization of an *organization's* accomplishment of some aspect of its *goals*. *Quantitative* implies that some discriminator more than success/failure or yes/no criteria is needed. The focus is on the *organization* not on a specific project or program. Furthermore, what to measure is not obvious and performance is multidimensional so the appropriate *aspect* must be determined. In addition, for measurement to be meaningful, *goals* provide a reference point for comparison and judgement.

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Performance Measurement is Part of Performance Management

The “Performance Management Framework” as defined by the National Academy of Public Administration was presented. This provides the context for defining the organization’s performance metrics. Within the context of the organizations strategic, functional and tactical goals, objectives, and priorities, a set of strategic, functional, and tactical performance measures are selected. These measures are then used to control programs.

Align Measurement with Goals and Objectives

Decisions must be made as to which attributes to measure. The business goals define the need and entities to be measured must align with the goals. In addition, a balanced perspective on performance needs to be considered. Specific perspectives include:

- Sponsor (e.g., program cancellations, percent of system cost allocated to software)
- Customer (e.g., customer satisfaction, system availability, system quality)
- Internal business (e.g., cycle time, rework, earned value, defect containment)
- Innovation and learning (e.g., maturity level, staff attitude, new technology introduction)

Some examples of organizational improvement goals were provided:

- Internal process improvement
 - Reduce development time by 40% over 5 years
 - Reduce maintenance effort by 40% over 5 years
 - Reduce rework
- Customer Satisfaction
 - Improve predictability to within 10% over 5 years
 - Improve quality by a factor of 5 over 5 years

Standard definitions are needed when metrics are defined. Examples of items that require definition include: life cycle, size, and what is a project.

Criteria for Evaluating Performance Measures

Some key questions to ask with respect to performance measures:

- Are we measuring the right things?
- Are the measures aligned with goals and objectives?
- Are the measures based on strategy and objectives?
- Do the measures reflect:
 - Improvement in performance of mission
 - Improvement in performance of goals and objectives
 - Value added
 - ROI, costs, savings
- Are the measures good?
 - Measure of results
 - Linked to specific and critical processes
 - Understood by their audience and users

- Credible and effectively communicated
- Accurate, reliable, valid, verifiable, cost-effective, timely
- Do the measures provide a foundation for action?
- Are the measures used in the right way?
 - Strategic planning
 - Guide prioritization of program initiatives
 - Resource allocation decisions
 - Day-to-day management
 - Communicate results to stakeholders
- Are the measures used to manage the organization?

Dave’s summary statements identified that software development cannot implement performance measurements in a vacuum. Measurement definition requires the mission needs and goals, a customer life cycle perspective. Furthermore, the sponsor and software development managers must agree on the priority organizational areas to which software contributes. Multiple measures are required to gauge real improvement.

The following web addresses were provided for more information:

- <http://www.sei.cmu.edu>
- <http://www.sei.cmu.edu/sema>
- <http://www.itpolicy.gsa.gov/mkm/pathways/pp03link.htm>
- <http://www.dtic.mil/c3i/c3ia/itprhome.html>
- <http://www.balancedscorecard.com>

Boston SPIN Calendar

Information about Upcoming Meetings
by Johanna Rothman, Program Chair

June Meeting Announcement

Topic: Why Good Requirements Are Key to Successful Projects

Speaker: Kimberly Roberts

When: Tuesday, June 15, 1999. 6:30pm-8:30pm
6:30-7:00 Networking
7:00-7:10 Announcements
7:10-8:10 Featured Speaker
8:10-8:30 Questions and Answers

Who: Everyone (Academia, Government, Industry)

Abstract:

Some projects are behind schedule and/or over budget because the project staff doesn't really know what to do - they don't have adequate requirements. This presentation will present some techniques to writing better requirements, a knowledge of writing and structuring both functional and non-functional requirements, and requirements management via information models and traceability.

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The main types of requirements: user needs, functional, performance and interface, are highlighted as well as specialty (non-functional) requirements, that can actually make or break the successful development of your software and systems. This presentation will discuss how to write requirements and will discuss some real life scenarios of how these requirements helped other projects.

About the Speaker:

Kimberly Roberts is a Senior Application Engineer for Quality Systems & Software Inc. (QSS). Kimberly has a decade of experience with specialized knowledge in systems and software engineering environments, process improvement initiatives, and requirements information management.

She received her undergraduate degree from University of Massachusetts, Amherst in 1990 and has achieved Graduate Certification in an Advanced Software and Systems Administration Management Program at Worcester Polytechnic Institute.

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

Directions: From Route 128 in Needham, take exit 19A onto Highland Avenue East. Take your first right by the Ground Round and take your second left onto "A" Street. GTE is the last building on the right. Enter the parking lot by the GTE sign and come into the building by the cafeteria entrance, which is located to the left of the main entrance. There will be a security guard at the entrance.

Info: See our web page, <http://www.cs.uml.edu/Boston-SPIN>
For SPIN info, contact Johanna Rothman, 781-641-4046, or jr@jrothman.com

Looking for Interesting Speakers



All of you are potential speakers!

- Do you have a success story you're willing to share?
- Do you have a lesson learned you can discuss?

You can be a program speaker too. If you're concerned about creating a presentation, or about standing up in front of

people, I am willing to work with you to craft an outstanding presentation you will enjoy presenting, and the SPIN members will enjoy hearing.

The Program Committee always wants to get real live experiences from people who are doing process improvement in their organizations. So, let me know what you're doing that others will benefit from. Email: jr@jrothman.com, Phone: 781-641-4046.

Future Program and Speaker Schedule

Date	Speaker/Topic
Sept. 21, 1999 @ GTE	Tom DeMarco "Are Five levels Enough?"
Oct. 19, 1999 @ GTE	Michael Mah "Project Estimation"

Feature Article

This month's Feature Article is contributed by Carol Pilch. Carol is with GTE Government Systems and specializes in Software Process Improvement.

CMM Version 2.0



This article is a follow-up to write-ups in two previous editions of *In-the-SPIN* that provide information about Draft C of the Software Capability Maturity Model Version 2.0 and specifically, Levels 2 and 3.

Draft C, with additional minor updates, was scheduled to be released as Version 2.0 of the CMM in late 1997. However, because of the proliferation of models and the need to address capability maturity more broadly than software, the SEI was redirected by the Office of the Under Secretary of Defense (OUSD) to produce one integrated model. The redirection and subsequent effort became known as CMMI. The CMMI work began in early 1998 and a draft is scheduled to be released for public review and comment this August. Draft C, as I have been describing in these articles, has been incorporated into CMMI.

Maturity Levels 4 and 5

At levels 4 and 5 in CMM Version 2.0, Draft C, there are significant changes from CMM Version 1.1. At the time that Version 1.1 was released, limited information and data was available to characterize the best practices for levels 4 and 5 organizations. Therefore, the key driver in the changes at these levels is that there are now a number of organizations at maturity levels 4 and 5 and a larger amount of data available to characterize levels 4 and 5. Version 2.0, Draft C emphasizes the role of statistics and measurement in achieving organizational change and improvement.

Organization Asset Alignment

This is a new level 4 key process area introduced in Version 2.0, Draft C. Emphasis is on reuse, product lines, product families, domain engineering, and reengineering. Practices are based on empirical observations of what high-maturity organizations do. Meaningful statistical analysis of process data is used as a mechanism for controlling variation.

Organization Process Performance

This key process area addresses the organizational aspects of
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the Version 1.1 Quantitative Process Management key process area. The purpose of this level 4 key process area is to establish and maintain the organization's software process performance baselines and associated process performance models. These baselines and models support the quantitative management of the organization's and projects' software processes.

Statistical Process Management

The purpose of this level 4 key process area is to implement and control stable software processes that are capable of building high-quality software work products. Basically, the statistical nature of Quantitative Process Management as defined in Version 1.1 is more rigorous in Version 2.0, Draft C.

Defect Prevention

The purpose of this level 5 key process area is to identify the common causes of defects and other problems, and change the relevant process to prevent that type of defect or problem from occurring in the future. This key process area was a part of Version 1.1 and there are few changes incorporated into Version 2.0, Draft C.

Organization Process Innovation

This level 5 key process area represents a major re-write of Technology Change Management, a level 5 key process area in Version 1.1. The purpose of Organization Process Innovation is to identify process and technology improvements and innovations that would measurably improve the organization's software processes and thereby help achieve the organization's software process improvement and related business goals. Deployment is addressed as a separate key process area.

Organization Improvement Deployment

This level 5 key process area focuses on organizational change issues and addresses the deployment of both innovative and incremental changes. The purpose of Organization Improvement Deployment is to continually and measurably improve the organization's software processes by transitioning improvements into use in a systematic manner.

If you are interested in more information and details, including CMM drafts, on this topic, the SEI maintains a web page on this subject:

<http://www.sei.cmu.edu/technology/cmm/>

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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For information about SPINs in general including ***HOW TO START A SPIN*** contact:

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IN THE SPIN is available on our Web page.

TO RECEIVE NOTIFICATION OF NEW ISSUES send email addressed to danallen@danallen.com.

We have 2 separate email lists: one for this newsletter and one containing announcements that we receive from other process organizations and forward out.

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

Back issues and other information about Boston SPIN can be found at our WEB HOME PAGE:

<http://www.cs.uml.edu/Boston-SPIN/>

