There is a Method to this Madness:
Transforming Appraisal Findings into a Process Improvement Plan

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Our Organization

Network Centric Systems, Fullerton, CA

- Achieved SW-CMM Level 5 in October 1998
- Achieved SW-CMM Level 5 in September 2002
- Achieved SE CMMI Level 2 in October 2002
So much to do and where to start?

- Long list of findings from appraisals?
- Management wants to be Level ‘x’ by when?
- Where to get started?
- Can it be done with limited resources within time frame?
- How to develop a plan of action?
- How to manage to plan?

Is there a method to this madness!?!
The Method is Proven

- This method has worked for both implementation of the SW-CMM and CMMI at Fullerton

- SW and SE Maturity Goals and plans were established in April 2001

- Fullerton achieved goals as planned
  - SW-CMM Level 5 in 9/02 (twice in a row)
  - SE CMMI Level 2 in 10/02
Transform Findings to Plan

Input

- Business Goals
- Engineering Goals
- Resources*
- Appraisal Findings
- Gap Analysis
- Deployment Tasks
- Lessons Learned
- Project & Org Milestones

Process

- Analysis:
  - Affinitize inputs
  - Prioritize using goals
  - Determine actions and solutions
  - Prioritize actions and solutions
  - Schedule tasks
  - Estimate resources for tasks
  - Scrub tasks and resource estimates
  - Identify dependencies and critical paths
  - Review with Mgmt and Stakeholders

Output

- Process Improvement Plan(s)
- Integrated Master Plan (IMP)
- Integrated Master Sched. (IMS)
- Rate Charts
- Budget

* Resources = manpower and budget
Work with Management

• Review Business and Engineering Goals with Management - understand perspective
• Cultivate sponsorship
• Get management support to get project and stakeholders commitment and buy-in
• Ensure process improvements support goals
• Provide facts to support when goals can be achieved
  – Tasks in IMP/IMS
  – Resource loading - manpower & cost
  – Risks
• Provide alternate solutions & review risks
Use Analysis Tools

Affinitize inputs into common groups

Prioritize common groups using org goals -- determine what to tackle

Assign responsibility -- brainstorm actions and assign priorities

Peer Review actions and priorities (process group, stakeholders)

Review with Senior Mgmt for approval

Generate and refine IMP/IMS and determine resources

Use 5-Why’s or Fishbone analysis to identify causes as needed

Cause 1
Cause 2
Cause 3
Cause 4

Effect

Generate and Refine IMP/IMS

- Use historical data and engineering judgment
  - May need to define process, e.g., directive development:
    - Write directive & change requests
    - Engineering Process Group (EPG) peer review
    - Revise directive
    - Stakeholder review
    - Revise directive
    - Release directive
  - Scrub tasks and activities to essentials

Define tasks descriptions and dictionary (IMP)
Determine task duration and man-power resources
Develop schedule (IMS) and task dependencies
Check resource loading against available resource
Check schedule against project & org milestones
Peer review and scrub tasks/resources
Review with Senior Mgmt for approval
Develop Process Improvement Plan (PIP)

- Use IMP and IMS as input
- Flow down Business and Engineering goals
  - Identify long term strategic goals
  - Identify near term goals
- Describe operational concepts, roles and responsibilities
- Describe process improvement objectives, activities, and tasks
- Identify risks and man-power resources
- Include high level schedule
- Trace process improvement activities to Business goals, Engineering goals, and appraisal findings
- Peer review PIP and get approval from senior management
- Review PIP activities with project mgmt & stakeholders
Managing to Process Improvement Plan (PIP)

• Manage process improvement activities as a project
• Develop Monitoring and Control metrics and reports
  – Schedule Gantt Charts
  – Rate Charts - status of task completion
  – Budget - man-power
  – Risk Management
• Status progress weekly within Engineering Process Group
• Review project status at project process meetings
• Conduct periodic project review of progress against PIP status with senior management (include stakeholders)
Rate Charts

Effective Tool for Measuring Progress

- Rate Charts measure if the right amount of work is accomplished as planned
- Progress feeds into Earned Value
- Define inch stones and weight for taking completion credit, e.g., Building evidence notebooks
  - Kickoff KPA notebook building activities
  - Redline review of evidence matrix
  - Built notebook with evidence
  - Peer review notebook
  - Update notebook evidence
  - etc.
### Sample Rate Chart

**Activity Worksheet Excerpt**

#### Inch stones

- Worksheet shows breakout of an activity
- Updated weekly - input to Activity Summary rate chart

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#### Level 2

| RM - Plan            |     | 06/21  | 06/28          | 07/15          | 07/22       | 08/01       | 08/08                 | 08/16          | 08/23        | 08/30          | 08/30            | 47.5%      |
| RM - progress        |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| SPP - Plan           |     | 06/21  | 07/03          | 07/19          | 07/22       | 08/01       | 08/09                 | 08/16          | 08/23        | 08/30          | 08/30            | 17.5%      |
| SPP - progress       |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| SPD - Plan           |     | 06/21  | 07/03          | 07/24          | 07/31       | 08/07       | 08/14                 | 08/21          | 08/28        | 08/30          | 08/30            | 17.5%      |
| SPD - progress       |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| SOA - Plan           |     | 06/28  | 07/03          | 07/26          | 08/02       | 08/09       | 08/16                 | 08/23          | 08/30        | 08/30          | 08/30            | 17.5%      |
| SOA - progress       |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| SCM - Plan           |     | 06/21  | 06/28          | 07/26          | 08/02       | 08/09       | 08/16                 | 08/23          | 08/30        | 08/30          | 08/30            | 44.5%      |
| SCM - progress       |     | 100%   | 100.00%        | 90.00%         | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |

#### Level 3

| EIM - Plan           |     | 06/21  | 07/03          | 07/24          | 07/31       | 08/07       | 08/14                 | 08/21          | 08/28        | 08/30          | 08/30            | 17.5%      |
| EIM - progress       |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| SPE - Plan           |     | 07/03  | 07/03          | 07/24          | 08/02       | 08/09       | 08/13                 | 08/16          | 08/23        | 08/30          | 08/30            | 17.5%      |
| SPE - progress       |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| E - Plan             |     | 06/21  | 07/10          | 08/01          | 08/09       | 08/15       | 08/20                 | 08/23          | 08/30        | 08/30          | 08/30            | 17.5%      |
| E - progress         |     | 100%   | 100.00%        | 100.00%        | 100.00%     | 50.00%      | 50.00%                | 50.00%         | 50.00%       | 50.00%         | 50.00%           |            |
| PR - Plan            |     | 06/21  | 07/10          | 07/24          | 07/31       | 08/07       | 08/14                 | 08/21          | 08/28        | 08/30          | 08/30            | 17.5%      |
| PR - progress        |     | 100%   | 75.00%         | 100.00%        | 75.00%      | 100.00%     | 100.00%               | 100.00%        | 100.00%      | 100.00%        | 100.00%          |            |

**Total Progress %** 15 100.0% 93.3% 33.3% 0.0% 0.0% 60.0% 0.0% 0.0% 0.0% 20.0% 27.7%

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Sample Rate Chart
Activity Summary Excerpt - Tabular Data

- Progress fed into Activity Summary weekly
- Composite progress computed for activity

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| Task behind plan | Task ahead of plan |
Sample Rate Chart

*Activity Summary Excerpt - Composite Chart*

- Great visual indicator of progress against plan
- Provide leading indicator if progress will be on plan

Sample Rate Chart

Activity Summary Excerpt - Composite Chart

- Great visual indicator of progress against plan
- Provide leading indicator if progress will be on plan
Key Factors to Organizing Findings into a Manageable PIP

- Collect findings and other input
- Important to map and prioritize process improvement activities to fulfill Business and Engineering Goals
- Systematically analyze and prioritize inputs
- Brainstorm solutions and prioritize
- Develop IMP/IMS and allocate resources (use historical data when available) - scrub
- Develop PIP and obtain senior management approval
- Work with projects and stakeholders, be cognizant of their schedule and demands
- Accountability - manage progress against PIP, period review with senior management
There is a Method to this Madness:
Transforming Appraisal Findings into a Process Improvement Plan

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