Return On Process (ROP):
Getting Real Performance Results from Process Improvement
For in-depth information

Look for my new book in 1Q2013
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The Current State of Process “Improvement”
First, a Quiz – True or False

False  If we achieve a CMMI maturity level, ISO/AS/TL registration, or ITIL certification, we have improved our performance.

False  If we implement Lean or Six Sigma, we will improve our performance.

False  We can improve our processes by writing better or more detailed processes and procedures.

False  If we improve our processes, we will automatically see performance results.

False  Implementing Agile will improve performance.

False  Using models and standards is the best place to start with improvement efforts.
Why Do We Need ROP, and Why Now?

- Many of the giant financial institutions that would have collapsed in 08 and 09 without taxpayer bail-out had achieved CMMI maturity levels or SOX compliance … where was the performance?
- A giant auto maker – also bailed out – had achieved CMMI maturity levels for years … where was the performance … where were the controls?
- A major airframe integrator and defense contractor, with years of AS9100 registrations and CMMI maturity levels, has its multi-billion dollar contract cancelled by the Navy for lack of performance.

When business leaders invest in tools and technology, they closely track and watch for the return on the investment. When they invest – sometimes many millions – in process improvement, why does no one track the resulting performance results … the Return on Process?
What’s Wrong with Models and Standards

Inherently, nothing. It’s how people perceive or misperceive, or use or misuse them that is the problem:

1. Viewed as “requirements” or prescriptive instead of viewed as guidelines
2. Viewed as “best practices” without implementation context
3. Perceived literally instead of conceptionally or notionally
4. Used as a “test” instead of a measure
5. How models and standards are “sold” (see following slides)
### What’s Wrong with Models and Standards

<table>
<thead>
<tr>
<th>Organizations that use the CMMI</th>
<th>Successful organizations</th>
<th>Unsuccessful organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This is the subset of organizations touted to promote CMMI adoption.</td>
<td>What is the size of this subset relative to the superset?</td>
</tr>
<tr>
<td>Organizations that don’t use the CMMI</td>
<td>What is the size of this subset relative to the superset?</td>
<td>What is the size of this subset relative to the superset?</td>
</tr>
</tbody>
</table>

**It’s how they are sold:**

When the “benefits” of CMMI use are presented or published, only a subset of the entire set of possibilities are addressed.
Real Performance Improvement
What is “Performance” and ROP?

The amount of useful work accomplished by a system compared to the time and resources used.

“Better Performance” means more work accomplished in shorter time and/or using less resources.

ROP = The value of “better performance” less the investment in process improvement.
Three Ways to Improve Performance

There are only three things you can change to improve business performance:

- Improving skills, knowledge, and learning can affect productivity and quality.
- Improving technology can affect delivery cycle time through greater automation and efficiency.
- Improving processes can contribute to greater effectiveness, efficiency, and quality via process performance.
## Three Ways to Improve Performance

<table>
<thead>
<tr>
<th>Improvement Dimension</th>
<th>Possible Performance Improvement</th>
<th>Relationship to Other Ways to Improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve people</td>
<td>Improving the knowledge, skills, and expertise of workers can enable them to perform tasks more effectively and efficiently. Systemic capture, analysis and dissemination of organizational learning and knowledge assets lowers knowledge and skill acquisition and replacement costs.</td>
<td>Process: Defined processes should accommodate user spectrum of novice performers and expert performers. Technology: Technology may need to be improved to not “dumb down” task performance for workers.</td>
</tr>
<tr>
<td>Improve technology</td>
<td>Introducing new technology or improving existing technology can automate information transactions and task performance, which can yield faster delivery of higher quality products and services.</td>
<td>People: Ironically, the reason many technology insertions/changes not only do not yield performance improvement, they often diminish performance because workers are not trained to use the technology effectively and efficiently. Improvement in technology almost always requires changes to worker knowledge and skills. Process: Defined and performed processes need to accommodate the use of the new or changed technology.</td>
</tr>
</tbody>
</table>
## Three Ways to Improve Performance

<table>
<thead>
<tr>
<th>Improvement Dimension</th>
<th>Possible Performance Improvement</th>
<th>Relationship to Other Ways to Improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve process</td>
<td>An organization can improve performed processes, defined processes, or both. (See Chapter 2, Real Process Improvement.) Improving process can enable workers to perform tasks more effectively and efficiently to deliver higher quality products and services in shorter time frames and with less effort.</td>
<td>People: When processes are defined or reengineered, workers need to be educated in the use of the new or changed processes in order to perform them effectively. Technology: Process performance (per the defined processes) often incorporates the use of technology. Thus, improvements to processes often require concommitent changes to tools and systems that support process performance.</td>
</tr>
</tbody>
</table>
Learning What to Improve and Why

If I had an hour to save the world, I would spend 59 minutes defining the problem...and one minute finding solutions.

– Albert Einstein
Learning What to Improve and Why

The first step in performance improvement is learning or knowing what to improve, and why. Important considerations include:

1. What are the significant challenges or barriers to higher performance?

2. What needs improving the most: deliverable quality, delivery time, delivery cost?

3. If we don’t improve anything, will we be better off, the same, or worse off in our market space?

4. How will the proposed improvement support our strategy(ies)?
## Learning What to Improve and Why

<table>
<thead>
<tr>
<th>Current Problem or Risk</th>
<th>Candidate Improvement Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diminishing revenue</td>
<td>Competitiveness</td>
</tr>
<tr>
<td></td>
<td>Market/customer base</td>
</tr>
<tr>
<td></td>
<td>Marketing, branding, or eminence</td>
</tr>
<tr>
<td></td>
<td>Value proposition</td>
</tr>
<tr>
<td></td>
<td>Product market life</td>
</tr>
<tr>
<td>Diminishing profit or shareholder value</td>
<td>Revenue</td>
</tr>
<tr>
<td></td>
<td>Market space/customer base</td>
</tr>
<tr>
<td></td>
<td>Operating or product realization efficiency</td>
</tr>
<tr>
<td>Diminishing capacity</td>
<td>Leadership</td>
</tr>
<tr>
<td></td>
<td>Workforce skills, morale, or incentives</td>
</tr>
<tr>
<td></td>
<td>Cost of labor</td>
</tr>
<tr>
<td></td>
<td>Cost of capital</td>
</tr>
<tr>
<td></td>
<td>Operating efficiency or efficacy</td>
</tr>
<tr>
<td></td>
<td>Throughput</td>
</tr>
<tr>
<td></td>
<td>Technology</td>
</tr>
<tr>
<td></td>
<td>Process efficiency or efficacy</td>
</tr>
<tr>
<td></td>
<td>Regulatory compliance</td>
</tr>
</tbody>
</table>
Almost any change will drive some amount of change to people, technology, and process. However, the organization should focus the improvement where it expects to get 80 of the percent performance results – people, technology, or process.

- **People**: If the performance objectives and measures indicate the greatest improvement gain will come from increasing the knowledge, skills, expertise, or motivation of workers, then focus the improvement on people.

- **Technology**: If the performance objectives and measures indicate the greatest improvement gain will come from technological changes or improvement (i.e., automation), then focus the improvement on technology.

- **Process**: If the performance objectives and measures indicate the greatest improvement gain will come from process improvement, then focus the improvement on process.
Learning What to Improve and Why\textsubscript{5}

The place for best practices in performance improvement:

<table>
<thead>
<tr>
<th>Capability segment</th>
<th>Improvement focus</th>
<th>The place for best practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiation: Capabilities that set your organization apart from all others in your market space.</td>
<td>Innovate</td>
<td></td>
</tr>
</tbody>
</table>
| Core: Capabilities critical to your business but are not your source of competitive advantage; includes areas of work such as product development, service delivery, customer support, sales/marketing and business development. | Automate  
Simplify  
Outsource | Improve technology  
Improve process  
Improve people |
| Support: Capabilities necessary for running your business yet are not your core business. This includes areas such as IT, HR, finance, legal, security, facilities, and operations. | Eliminate  
Minimize  
Outsource | Improve process  
Improve process  
Improve people |

Extrapolated from Stephen Shapiro’s Innovation Targeting Matrix in Best Practices Are Stupid.
Establishing Performance Objectives

After establishing what performance to improve and why, the next step is to establish performance objectives. Criteria for performance objectives or goals include:

- The goal supports the organization’s strategy and vision
- The goal is aligned with the organization’s core business and core competency
- The goal is achievable and neither unrealistic nor mediocre
- There is a consensus understanding among the goal stakeholders of the meaning of the words used to define the goal
- Achievement of the goal is measurable and/or observable
- The goal identifies what must be accomplished and perhaps why, but not how
- The goal can be communicated, and can be easily articulated by everyone in the organization
- This goal can be prioritized with other goals
- The business benefit(s) resulting from the goal’s achievement can be identified and articulated
- The products or deliverables that would result from goal achievement can be identified
Measuring Performance

Things to keep in mind when you plan and define performance measures:

- "Success" is never one measure or indicator.
- What gets measured, gets attention. Or, what you measure or reward is what you get.
- Take a contextual, wide perspective view of performance measures.
- The act of measuring or observing can affect what is being measured.
Measuring Performance

Picture of gate agents at airport checking bags for free
Measuring Performance

Example of context-based performance measurement – the effects of increasing product or release content:
Measuring Performance

Before you implement an improvement, know what to observe or measure to determine the extent of the improvement.

<table>
<thead>
<tr>
<th>Project Performance</th>
<th>Product Performance</th>
<th>Process Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (CPI)</td>
<td>Quality</td>
<td>Efficiency</td>
</tr>
<tr>
<td>Schedule</td>
<td>Functionality</td>
<td>Efficacy</td>
</tr>
<tr>
<td>Earned Value</td>
<td>Maintainability (and MTBF)</td>
<td>Billable : Overhead ratio (or</td>
</tr>
<tr>
<td>Cycle time</td>
<td>Safety</td>
<td>Direct : Indirect)</td>
</tr>
<tr>
<td>Scope management</td>
<td>Security</td>
<td>Productivity</td>
</tr>
<tr>
<td></td>
<td>Unit Product Cost</td>
<td>Tailorability/Scalability</td>
</tr>
<tr>
<td></td>
<td>Shelf-life</td>
<td>Adoptability</td>
</tr>
<tr>
<td></td>
<td>Market life</td>
<td>Adaptability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extensibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Queuing / wait or lag time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redundancy</td>
</tr>
</tbody>
</table>
Measuring Performance

After establishing performance objectives, the organization should define the performance measures to be collected, reported, and analyzed. A robust measurement specification defines:

- Measure ID
- Measure name
- Performance objective(s) supported
- Measure type (process, product, project)
- Description
- Measurement level
- Source
- Collected by and how
- Calculations (for derived measures and indicators)
- Preferred analysis technique
- Reported to and how
Real Process Improvement
Achieving real process improvement involves:

1. Establishing process performance objectives that align with and support business performance objectives.
2. Improving the performed process.
3. Improving the defined process.
4. Synchronizing the performed and the defined process.
## Real Process Improvement

Example of aligning process performance objectives with business performance objectives:

<table>
<thead>
<tr>
<th>Sample business performance objective</th>
<th>Candidate processes performance improvement</th>
</tr>
</thead>
</table>
| Deliver customer fixes and enhancement requests faster | Requirements development process  
Project scope management process  
Product design and development processes  
Product release and delivery process |
| Reduce call-to-closure service request lapsed time by 20 percent | Help-desk processes  
Call transfer and escalation processes  
Call record capture processes and tools |
| Reduce the cost of learning (COL) by 10 percent per year | Lessons-learned process  
Lessons-learned capture and access process  
Training acquisition and delivery process |
| Increase name and brand recognition by one million customer potentiates per year | Content management process  
Employee brand promulgation process  
Media content development and delivery process |
Define the relationship between the process improvement and the expected performance improvement.

<table>
<thead>
<tr>
<th>Process Improvement</th>
<th>Expected Business Performance Improvement</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve project risk management practices</td>
<td>Projects perform within estimated budgets</td>
<td>Effective risk management practices can mitigate the impact of risks that cause over-spending</td>
</tr>
<tr>
<td>Define test procedures</td>
<td>Reduce the number and density of defects in released products and subsequently increase customer satisfaction</td>
<td>Missed or incorrectly performed steps in testing causes product defects to go undetected</td>
</tr>
<tr>
<td>Develop a standard for product requirements and use that standard to review requirements</td>
<td>Reduce the cost associated with rework in product design and development</td>
<td>Design and development rework has been attributed to poor requirements</td>
</tr>
<tr>
<td>Introduce standards for conducting meetings</td>
<td>Reduce operating costs</td>
<td>There is waste/loss cost associated with meetings that do not result in defined decisions, actions, or outputs</td>
</tr>
<tr>
<td>Implement an organization-wide lessons learned</td>
<td>Reduce operating costs</td>
<td>There is significant waste/loss cost associated with individuals and teams relearning things that have been previously learned by others</td>
</tr>
</tbody>
</table>
Improving the Defined and the Performed Process

Understand the relationship between the performed process and the defined process:

Many organizations spend hundreds of thousands or millions of dollars improving their defined (written) processes. But the only aspect of process that provably affects performance is the performance of the process.

Process performance can be improved irrespective of how it is defined, or even if it is defined.
Improving the Defined and the Performed Process

Understand the relationship between the performed process and the defined process:

Simply improving the defined processes doesn’t necessarily improve performance. However, we can positively affect business performance dimensions such as throughput, efficiency, efficacy, and product quality if the following conditions are true:

1. Our process representations (defined processes and assets) enable efficient and effective process performance, and if

2. There is high fidelity between the performed process and the defined process, and if

3. The affects of skill or technology changes on performance are negligible.
Improving the Defined and the Performed Process

Three ways to improve the performed process:

1. Accelerate process performance
   - Reduce process performance tasks or steps
   - Reduce lag or wait-states
   - Implement parallel or concurrent process performance

2. Improve process performance efficacy

3. Improve performed process output quality
   - Preventive quality
   - Corrective quality
Improving the Defined and the Performed Process

Improving the defined process involves:

1. Treat the process as a product
2. Build the process for its users
3. Design the process for the way users work
4. Establish process design standards
5. Provide meaningful process tailoring
Before you can improve process performance by changing the defined process, you first need to determine the fidelity between the defined and the performed process. SCAMPI appraisals and ISO/AS audits won’t necessarily do this!
Synchronizing the Defined and the Performed Process

The illustration below shows a natural evolutionary path to synchronizing the defined and the performed process.

Return On Process (ROP)
Real Process Improvement

Stage 1: Baseline
Equalize defined and performed processes; define the as-is performed process

Stage 2: Define
Define to-be performed process (future state); incorporate best practices

Stage 3: Implement
Change performed process to comply with defined process (implementation)

Stage 4: Institute
Monitor, measure, and adjust both performance and defined processes; (continuous improvement)
Getting the Return On Process (ROP)
Getting the Return on Process (ROP)

Realizing the return on process improvement (ROP) involves:

1. Measuring the effects of changes to the performed process
2. Measuring the effects of changes to the defined process
3. Valuating the effects

Measure what you changed.
Getting the Return on Process (ROP)²

Example of making changes to the defined and performed peer review process:

<table>
<thead>
<tr>
<th>Peer review performance dimension</th>
<th>Baseline (before improvement implementation)</th>
<th>Performance (post improvement implementation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of peer reviews conducted per project</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Percentage of peer reviews conducted on requirements work products</td>
<td>2 percent</td>
<td>18 percent</td>
</tr>
<tr>
<td>Percentage of peer reviews conducted on project planning work products</td>
<td>3 percent</td>
<td>14 percent</td>
</tr>
<tr>
<td>Average number of peer review iterations on the same work product</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Average number of defects detected in peer reviews</td>
<td>35</td>
<td>47</td>
</tr>
<tr>
<td>Percentage of technical or content defects detected in peer reviews</td>
<td>11 percent</td>
<td>45 percent</td>
</tr>
</tbody>
</table>
Getting the Return on Process (ROP)³

Example of making changes to the defined and performed peer review process:

<table>
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<tbody>
<tr>
<td>Percentage of technical or content defects detected in peer reviews</td>
<td>11 percent</td>
<td>45 percent</td>
</tr>
<tr>
<td>Defects removed in first peer review of a work product as a percentage of all defects eventually removed through all iterations</td>
<td>65 percent</td>
<td>85 percent</td>
</tr>
<tr>
<td>Average peer review effort per reviewer (planning, conduct, and follow-up defect removal)</td>
<td>5.5 hours</td>
<td>6.2 hours</td>
</tr>
<tr>
<td>Average number of people involved in a peer review</td>
<td>4.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Average downstream savings per defect removal</td>
<td>No baseline; will estimate based on peer review literature and benchmarks</td>
<td></td>
</tr>
</tbody>
</table>

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Getting the Return on Process (ROP)\textsubscript{4}

Example of measuring process efficacy improvement:

<table>
<thead>
<tr>
<th>Process efficacy improvement</th>
<th>Post-improvement measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work necessity</td>
<td>Tasks/steps that were not performed but needed to be performed and associated waste, rework or lost value</td>
</tr>
<tr>
<td></td>
<td>Tasks/steps that were performed but were not needed an associated waste</td>
</tr>
<tr>
<td>Work results</td>
<td>Effort and cost saved not performing actions that do not result in creation or change of state of work products</td>
</tr>
<tr>
<td></td>
<td>Value of work products created or changed resulting from actions performed that previously did not yield results</td>
</tr>
</tbody>
</table>
Return On Process (ROP)

Getting the Return On Process
Small Changes, Big Performance Improvement
Small Changes, Big Performance Improvement

Not all improvements have to be grandiose, sweeping changes. Using the “tyranny of numbers” principle, a performance improvement that results from one person or one team implementing even a small change multiplies by the number of people, teams, or occurrences of change. Small changes that yield big performance improvement include:

- Use 20 to do the 80
- Making meetings work
- Involve the right people for the right work at the right time
- Learn one, learn all
- Do only what really needs to be done (and no more)
- Make decisions once and make good decisions
- Do less to do more
Small Changes, Big Performance Improvement

Example* savings using “Signature” feature in MS Outlook.

<table>
<thead>
<tr>
<th>Organization Size (# of employees)</th>
<th>Daily Savings (person-hours)</th>
<th>Quarterly Savings (person-days)</th>
<th>Annual Savings (person-days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>2.5</td>
<td>17.6</td>
<td>70.3</td>
</tr>
<tr>
<td>100</td>
<td>5.0</td>
<td>35.2</td>
<td>140.6</td>
</tr>
<tr>
<td>500</td>
<td>25.0</td>
<td>175.8</td>
<td>703.1</td>
</tr>
<tr>
<td>1000</td>
<td>50.0</td>
<td>351.6</td>
<td>1,406.3</td>
</tr>
<tr>
<td>10000</td>
<td>500.0</td>
<td>3,515.6</td>
<td>14,062.5</td>
</tr>
<tr>
<td>100000</td>
<td>5,000.0</td>
<td>35,156.3</td>
<td>140,625.0</td>
</tr>
</tbody>
</table>

An organization with 100,000 employees could save 625 person-years per year!

* Detailed scenario provided in book: Return on Process (ROP): Getting Real Performance Results from Process Improvement
About Natural SPI

Natural SPI …

- Is a small, woman-owned process and performance improvement consultancy founded in 2001
- Is a Software Engineering Institute (SEI) Partner for SCAMPI appraisal services and Introduction to the CMMI training
- Integrates customer improvement efforts based on the CMMI, Lean, Six Sigma, balanced score card, PMBoK, and ITIL
- Employs a virtual office model for greater flexibility and responsiveness to customer needs at a cost-effective price
- Has extensive, hands-on process and performance improvement experience (not just a “talk-shop”)
- Principal Michael West is author of Real Process Improvement Using the CMMI (Auerbach, 2004), and Return On Process (ROP): Getting Real Performance Results from Process Improvement (to be published by CRC Press 1Q2013)
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Questions and Discussion