Do’s and Don’ts of Process Improvement

Pat O’Toole, PACT

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Acknowledgments

Terms like these are often used in the following material:

CMM® Framework
IDEAL™ Model

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“Primary” Lessons Learned

• Secure Senior Management Sponsorship
• Treat SPI as a Project
• Engage Internal Staff.
OK, what now?

• Yeah, but what do we DO?

• And is there anything we should AVOID doing?
Caveat

• Weinberg’s Organizational Dichotomy
  – No two organizations are entirely the same
  – No two organizations are completely different

• Weinberg’s Law of Raspberry Jam
  – The broader you spread it, the thinner it gets

• This tutorial covers 32 specific Do’s and Don’ts
  – Assume about a 20% “raspberry jam” rate
  – The rest is intended for “a friend of yours.”
Do’s and Don’ts

• Senior Management
• CMM(I)
• Measurement
• Process
• Behavioral Change
• (K)PA Specific
• Message from our Sponsor
Do’s and Don’ts: Senior Management

“Sponsorship” is nice, *Proactive Leadership* is better!

- **Don’t** Treat the Level as the Goal
- **Do** Establish “Alignment Principle”
- **Do** Take Time Getting Faster
- **Do** Align the Reward System
- **Do** Ask Different Questions
- **Do/Don’t** Lead by Example
Don’t Treat the Level as the Goal

• What are you really trying to achieve?
  – What is the business imperative?
  – How do your customers evaluate your products?
  – Why do potential customers keep buying your competitor’s products?

• Which would be better:
  – Achieve Level 2, but NOT the business objectives
  – Achieve the business objectives, but NOT Level 2?

• So what’s the REAL goal?
Don’t Treat the Level as the Goal

• Maximize the VALUE, not the LEVEL!
  – **Problem:** Focusing on the level establishes conflict between the SPI project and the software projects
  – **Solution:** Focusing on the business imperative produces harmony
    • Well, at least it reduces the conflict!
    • Lends credibility to the SPI program
    • Changes discussion from “if” to “how.”
Do Establish “Alignment Principle”

- Faster, Better, Cheaper - pick ONE!
- If you could improve in only 1 area, which would it be?
  - Which “number one priority” is really on top?
  - Remember Deming’s “constancy of purpose”?
Do Establish “Alignment Principle”

• Example:
  – “Achieve an annual, sustainable 10% reduction in field reported defects without degrading current levels of cost, schedule, and functional variance.”

• Align business, project, and SPI goals
  – SPI becomes “Software Project Improvement”

• Communicate this broadly

• Focus with a passion!
Do Take Time Getting Faster

• Why would your customer believe 6 months when they don’t believe 8?
  – Do YOU believe it?
  – Have you seen the plan?
  – Is it credible?
  – Remember: A wish is NOT a plan!

• How will the troops respond to this goal?
**Do** Take Time Getting Faster

- Despite what they SAY, most customers WANT predictability - they want to believe
  - Applies equally well to:
    - Internal customers (Product Mgt / Marketing)
    - External customers

- Prerequisite: enhance the credibility of your estimates
  - The troops want to be believed!
  - It’s a matter of professional integrity.
Improving Capability

- **Improve predictability**
- **Improve control**
- **Improve performance**
Do Align the Reward System

• What behavior do you reward today?
  – Who received the last few achievement awards?
  – Why did they receive them?
  – Why do people *perceive* they received them?
    • Perception is reality to the perceiver
  – Are the reward system and the Alignment Principle aligned?
Do Align the Reward System

• The behavior you reward is the behavior you get
  – Stop rewarding process arson and fire fighting
  – Start rewarding disciplined planning & execution

• Not all rewards are monetary
  – Atta-boys
  – Success stories published
  – Executive recognition
  – Promotions

• But money’s nice too!
Do Ask Different Questions

• What do you ask about in project reviews today?
  – Is the project on schedule?
  – Is the project on budget?
  – Whose fault is it?
  – Why don’t I see anybody in here on Saturday?

• Do you ask any questions related to process or process improvement?
Do Ask Different Questions

• The power of the executive question:
  – Management can:
    • influence behavior by asking different questions
    • change behavior by insisting on getting the answers!

• Try asking:
  – Is SPI helping you achieve our alignment principle?
  – What improvements are you piloting?
  – What SPI suggestions have you made recently?
  – What are the pain points in the current way of doing things?
Do/Don’t Lead By Example

• What are **YOU** doing to become more process disciplined?
  – Are any of **your** processes documented?
  – Does anyone verify that **you** are following them?
  – Are **you** trying to improve them over time?

• **Are you** sending the message, “Do as I say, not as I do”? 
Do/Don’t Lead By Example

• Consider documenting the Organizational Commitment Process first
  – “How does our organization commit to doing work on behalf of a customer?”
  – Involve peers in Marketing/Product Management
  – Pilot the process
  – Have SQA verify adherence

• Demonstrate your personal commitment to process discipline and process improvement

• Sponsorship is nice; proactive leadership is better!
Exercise

• **Do’s and Don’ts: Senior Management**
  – Don’t Treat the Level as the Goal
  – Do Establish “Alignment Principle”
  – Do Take Time Getting Faster
  – Do Align the Reward System
  – Do Ask Different Questions
  – Do/Don’t Lead by Example

• **What now?**
  – Which would help your organization the most?
  – What are you going to do when you get back?
  – Are there other Senior Mgt Do’s and Don’ts?
Do’s and Don’ts

• Senior Management
• CMM(I)
• Measurement
• Process
• Behavioral Change
• (K)PA Specific
• Message from our Sponsor
Do’s and Don’ts: CMM(I)

“All models are wrong; some models are useful”

• **Don’t** Treat the CMM(I) as the Bible
• **Don’t** Train the Masses on CMM(I)
• **Do** Become a Stronger Maturity Level 1
• **Don’t** Skip Over Maturity Level 2
• **Don’t** Use Appraisals for Diagnosis
• **Don’t** Use the Continuous Representation
• **Don’t** Use the Staged Representation
Don’t Treat the CMM(I) as the Bible

• Does Watts really look that much like Moses?
  – The CMM(I) is a good book but it’s not THE good book!
  – 1000+ suggested changes submitted

• It’s just a model!
  – Goals - sound engineering/management principles
  – Practices - one way to accomplish the goals
  – Subpractices - insight into the practices.
Don’t Treat the CMM(I) as the Bible

• Don’t have one policy per (K)PA!
  – Apply CMM(I) with your brain in “ON” position
  – Consider policies for:
    ● Project Management Stuff
    ● Engineering Stuff
    ● Process Stuff
  – Write the policy LAST

• Look elsewhere for additional guidance
  – IEEE standards, ITIL, ISO, Baldridge
  – Books, periodicals, employees, Dilbert, etc.
Don’t Train the Masses on CMM(I)

• Have you heard the expressions:
  – Here we go again?
  – The next silver bullet?
  – Yet another flavor of the month?
  – This too shall pass?

• Have you ever read the CMM(I) like a novice?
  – “System requirements allocated to software”?
  – “Software process database”?
  – “Organization(al) Process Focus”?
  – “Instantiation”???
Don’t Train the Masses on CMM(I)

• What should you do?
  – Train the SEPG on the CMM(I)
  – Train Process Action Teams on relevant portions
  – Train the unwashed masses on THEIR process
  – Consider providing CMM(I) orientation after:
    • Initial value has been proven
    • Momentum has been established

• Translate CMM(I)ese into local jargon
  – In order to influence behavior, folks have to understand it!
Do Become a Stronger Level 1

• How many Process Action Team do you have?
  – Do you have a PAT for each of the Level 2 KPAs?
    • Is your “process pain” equally distributed?
    • Can projects absorb all of these concurrent changes?
• Are the project managers, the SEPG’s customers, actively involved in establishing SPI requirements and priorities?
Do Become a Stronger Level 1

• Treat Level 1 as a continuum, not a point value
  – Improve in a few areas to gain:
    • Experience
    • Credibility
    • Momentum
    • Process discipline
  – One or two improvements per target audience
  – It's OK to improve in non-CMM(I) areas

• It’s the education, not the degree, that makes you smarter.
Don’t Skip Over Level 2

• Level 2 approach:
  – Document the “as is” practices
  – Basis for improvement and sharing good practice

• There is no "CMM(I) Level 2 In-a-Box”
  – It’s not the process documentation, Stupid!
  – The process documentation is NOT the process

• Believe it or not, it’s a BEHAVIORAL model.
Don’t Use Appraisals for Diagnosis

• Diagnosis implies sickness/disease
  – Nobody enjoys going to the doctor

• An appraisal should be more like a health check
  – “Health” is our overall feeling of well-being
    • Many people do enjoy going to the health club
  – Assume that the patient is already healthy
    • "Seeking opportunities to make the organization even better than it already is"
    • Assume that the patient wants to get even healthier
  – However, IHEAL sounds worse than IDEAL!
Don’t Use Appraisals for Diagnosis

• It’s not about levels, it’s about capability
  – Process improvement is a *tactical* approach to achieve a *strategic* business objective
  – When the map and the terrain disagree, always believe the terrain
    • The process documentation is the map
    • The process as performed is the terrain
  – Alternatively:
    • The level is the map
    • The behavior is the terrain.
Don’t Use the Staged Representation

Don’t Use the Continuous Representation

• Staged representation
  – Prescribed ordering with proven results
  – Organizational change model

• Continuous Representation
  – Feel the pain/fix the pain
  – More granular level of information
  – Encouragement to consider quantitative management in any/all process areas

• Don’t use either – Do use both.
## Maturity Level 2 Example

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Do’s and Don’ts

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• Message from our Sponsor
Do’s and Don’ts: Measurement

“In God we trust, all others bring data”

- **Do** Employ Basic Measures NOW!
- **Don’t** Collect Data You Don’t Use
- **Do** Enhance Data Integrity

Picture by Bill Riddle
(Used with permission)
**Do Employ Basic Measures NOW!**

- **You don't have a current baseline?**
  - If you don't start now, you'll be saying the same thing two years from now
  - Remember saying it two years ago?!

- **What to measure?**
  - Look to
    - The Alignment Principle
    - The goals of the process improvement program
  - Defects, effort, schedule.
Do Employ Basic Measures NOW!

- There is no physics in software
  - You can’t say, “It can’t be done”
  - You should be able to say, “We can’t do it”
- Management’s gut is typically bigger than yours.
Don’t Collect Data You Don’t Use

• Do you have “write-only” databases?
  – Do you use your:
    • Historical data to improve your estimates?
    • Inspection and risk data to detect trends?
    • Etc.

• Are your people “surveyed to death”?
  – Are your surveys valid?
  – Do things change based on the results?
    • Would the survey participants answer the same way?
Don’t Collect Data You Don’t Use

• Use it or lose it!
  – Data collection is an expensive investment
  – There is no ROI if the data is not used
• Don’t conduct appraisals if nothing is to change
  – Same for Employee Satisfaction Surveys, etc.
• Better yet - USE THE DATA!
Do Enhance Data Integrity

• Data => Information => Action/Decisions => Results
  – Many organizations have “numbers”, not data
  – Many others have “stuff”, not even numbers

• Define data for consistency
  – Operational definition or some other technique
    • Unambiguous definitions
  – Automate data collection whenever possible.
Do Enhance Data Integrity

• Track actuals at the same level you estimate
  – Don’t throw darts in the dark
  – Track actuals to motivate corrective action

• Providers of data must be consumers of the data
  – WIIFM?
  – Predictability/control/professional integrity/$100

• Adopt Grady’s Rules of Data Etiquette
  – Private vs. public data
  – Don’t misuse the data.
Do’s and Don’ts

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Do’s and Don’ts: Process

It’s NOT the process documentation, Stupid!

• Don’t Over-Engineer Processes
• Don’t Target Mega-Projects First
• Do Standardize Process, Not Procedure
• Do Establish a Process Architecture
• Don’t Make Gurus Write Processes
• Do Think “Good” Not “Best” Practice
Don't Over-Engineer Processes

• Engineers thrive on detail & elegance
• The "accordion effect" may be unavoidable
  – Typically start with very little in place
  – Develop thick process
    • Generate consensus
    • Train personnel
  – Developed abridged versions
    • Thin to win!
    • Experienced practitioner’s cheat sheet
    • SQA/PPQA’s review checklist
    • “Decomplexification.”
Don't Over-Engineer Processes

• Differentiate between:
  – Process documentation
  – Training material

• Don't give Process Action Teams too much time
  – Parkinson’s Law is sure to creep in

• Have "good case examples" for guidance.
Don't Target Mega-Projects First

• Many groups build the “standard process” to address their largest projects
  – Theory is: easier to eliminate, than to add
  – Problem: Projects have to “justify” scaling down
  – Question: If it were built small=>large, would it be fundamentally different?
Don't Target Mega-Projects First

• Build thin process layer for medium projects
  – Scrutinize/rationalize changes as it’s scaled up
  – Scale to accommodate additional:
    • Complexity
    • Coordination
    • Communication
    • Control

• Remember that the process serves the projects, not vice versa!
Do Standardize Process, Not Procedure

• Level 3: Organization Std Software Process
  – Process defines “what” is done
  – Procedure defines “how” it is done

• Localized procedures make sense for different:
  – Technologies/environments
  – Size/complexity of projects
  – Practices that are achieving success!

• Level 3 requires standardized processes, not procedures!
Do Establish a Process Architecture

• Organizes process elements
  – Policies
  – Processes
  – Process support elements
• Assists with navigation
• Leads to common process-related jargon.
Process Architecture

Tier 1: Policies
Tier 2: Processes (Lifecycles?)
Tier 3: Process Support Elements
- Methods
- Templates
- Guidelines
- Procedures
- Standards
- Training
- Tools
- Measures
Tier 4: Local Adaptation / Project Specific

WHATs
HOWs (Common)
HOWs (Local)

Do’s and Don’ts - v1.0
Don’t Make Gurus Write Processes

• SEPG can interview the guru
  – Have them “think out loud” as they work
  – Generate a rough draft of the current process
  – Work with the guru to sand down rough edges

• Tech writers can apply doc standards/packaging
  – Present tense
  – Active voice
  – Each step begins with responsible role
  – Standard acronyms/roles, no split infinitives, etc.
Don’t Make Gurus Write Processes

• Subject process element to peer review
  – Involve other subject matter experts
  – Changes “your process” to “our process”
  – Build in “voice of the customer”
  – Introduces peer reviews on “safe” work products

• Make changes based on their feedback
  – Don’t collect data you’re not going to use!
  – Gets their fingerprints on the process element
  – Further enhances buy-in.
Do Think “Good” not “Best” Practice

- Avoid religious warfare for a 2% improvement
  - “Just because I do it differently doesn’t mean I do it wrong”
  - Consistency is good, but weigh the cost/benefit
- Don’t exercise stupidity in the name of consistency!
Exercise

• **Do’s and Don’ts: CMM, Measurement, Process**
  – Don’t Treat the CMM as the Bible
  – Don’t Train the Masses on CMM
  – Do Become a Stronger Level 1
  – Don’t Skip Over Level 2
  – Don’t Use Assessments for Diagnosis
  – Do Employ Basic Measures NOW!
  – Don’t Collect Data You Don’t Use
  – Do Enhance Data Integrity
  – Don’t Over-Engineer Processes
  – Don’t Target Mega-Projects First
  – Do Standardize Process, Not Procedure
  – Do Establish a Process Architecture
  – Don’t Make Gurus Write Processes
  – Do Think “Good” Not “Best” Practice
Exercise

• What now?
  – Which would help your organization the most?
  – What are you going to do when you get back?
  – Are there other CMM, Measurement, or Process Do’s and Don’ts?
Do’s and Don’ts

• Senior Management
• CMM(I)
• Measurement
• Process
• Behavioral Change
• (K)PA Specific
• Message from our Sponsor
Do’s and Don’ts: Behavioral Change

If it isn’t helping the projects succeed, the SEPG is failing!

• **Do** Eliminate Low-Value-Added Tasks
• **Do** Pilot Early and Often
• **Do** Make Friday SPI-day
• **Do** Become a Learning Organization
• **Don’t** Ignore the Adoption Curve
Do Eliminate Low-Value-Add Tasks

• Seek and eliminate some useless administrivia
  – The plate is only so big!
• Do this early and make some friends
• Helps avoid the "process weenie" tag.
Do Pilot Early and Often

• Don’t debate issues in the ivory tower
  – Wastes a lot of time
  – Chances are, both sides are wrong!

• Run “alpha pilots” to test competing theories
  – Seek feedback from the process executors
    • Value vs. overhead/disruption
    • Skills and cultural fit
    • Toolability

• Run “beta pilots” to demonstrate readiness.
Do Make Friday SPI-day

- If you allocate part-time SEPG/PAT members:
  - Less than 20% is useless
  - Remember the Law of Raspberry Jam
    - The broader you spread it the thinner it gets
    - Don't spread it out - allocate a full day for SPI work
    - Friday is a lousy day - pick Wednesday instead!
- Hold SPI people accountable for:
  - Achieving their SPI milestones and deliverables
  - Renegotiating their SPI commitments
- Make it part of their performance review.
Do Become a Learning Organization

- Most organizations are Learning Organizations
  - But, most are Forgetting Organizations as well
- Don’t just cram for the final exam - use quizzes
  - At the end of each phase, ask:
    - What went right; why?
    - What went wrong; how could it have been avoided?
    - What problems escaped from previous phases?
  - Recommit to next phase work products/processes
    - Review “lessons identified”
      - From your last project
      - From other projects.
Do Become a Learning Organization

• The flip side of every assumption is a risk
  – And the flip side of every risk is an opportunity!
• Every problem is a risk that was overlooked
  – How can you gain better foresight next time?
  – Establish triggers indicating, “Here we go again!”
• Learn from other projects
  – Each project exploits organizational knowledge
  – Each project contributes as well
  – Flag data from “less than successful” projects
    • Otherwise, those who study history are bound to repeat it!
Don’t Ignore the Adoption Curve

• You will NOT convert the unwashed masses
  – Don’t waste cycles on the late majority/laggards
  – Target the innovators and early adopters
  – Prove the value and capture the early majority

• Senior management must exercise “tough love”
  – Apply pressure on the late majority
  – Apply sanctions on the laggards
  – Ultimately, compliance becomes part of the “salary continuation program.”
Do’s and Don’ts

• Senior Management
• CMM(I)
• Measurement
• Process
• Behavioral Change
• (K)PA Specific
• Message from our Sponsor
Do’s and Don’ts: (K)PA Specific

- **Do** Implement Value-Added SQA
- **Do** Evolve SQA’s Role
- **Do** Implement Peer Reviews Slowly
- **Do** Reinvigorate Your Peer Reviews
Do Implement Value-Added SQA

• Invest your best and brightest
  – Train them to serve as project coaches/mentors
  – Consult on the selection of process elements

• First focus on process adoption not compliance
  – Assist projects in adopting the process and deriving the intended value
    • Ask about the value of the process - and LISTEN!
    • Solicit feedback on administrivia/improvements
  – Are there resources/skills issues to be addressed?
  – Help them Obiwan, you’re their only hope!
Do Implement Value-Added SQA

• The first two audits of a new process are freebies
  – First one is “understanding”
  – Second one is “alignment”
  – Third one is for real

• Differentiate non-compliances by severity
  – Tailor reporting and escalation accordingly

• Consider naming SQA “Process Assurance”
  – Don't use full Process Assurance until you have:
    • Defined process
    • Work product standards.
Do Evolve SQA’s Role

• Level 1: SQA instills process discipline
  – Assists with process adoption
  – Compliance based on “fear of the audit”

• Level 2: SQA detects process erosion
  – Sampling is fine! Selection based on:
    • Most critical items
    • Systemic problems
    • Items selected at random
  – If major non-compliances, then conduct full audit
  – Perform trend analysis to detect process erosion.
Do Introduce Peer Reviews Slowly

• Peer reviews have huge potential payback
  – Provide higher quality products at a lower cost
  – Achieve application/technical cross-training

• Start with no more than 3 work products
  – Favor early life cycle work products
  – Requirements, design, high-complexity code?

• Add new work products slowly and judiciously
  – Sampling is OK!
  – Establish the process, value, buy-in, and culture.
Do Introduce Peer Reviews Slowly

• Conduct data analysis
  – Determine how data will be used
    • Work product defect density
    • Defect phase containment
  – Establish how data will NOT be used

• Softer, gentler approach
  – “Saves” and “escapes” vs. defects

• Inject defects to gauge review effectiveness
  – Hawthorne effect kicks in as well

• Make the team co-responsible for the quality of the work product.
Exercise

• **Do’s and Don’ts: Behavior and (K)PA Specific**
  – Do Eliminate Low-Value-Added Tasks
  – Do Pilot Early and Often
  – Do Make Friday SPI-day
  – Do Become a Learning Organization
  – Do Implement Value-Added SQA
  – Do Evolve SQA’s Role
  – Do Implement Peer Reviews Slowly
  – Don’t Ignore the Adoption Curve

• **What now?**
  – Which would help your organization the most?
  – What are you going to do when you get back?
  – Are there other Behavior or KPA Do’s and Don’ts?
Do’s and Don’ts

• Senior Management
• CMM(I)
• Measurement
• Process
• Behavioral Change
• (K)PA Specific
• Message from our Sponsor
Do Participate in Your Local SPIN

- Learn from others’ experience
- Get consultation on your issues
- Provide consultation on their issues
- Expand your network
- All for one low price of admission!
Questions?

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