How to Sell Process Improvement

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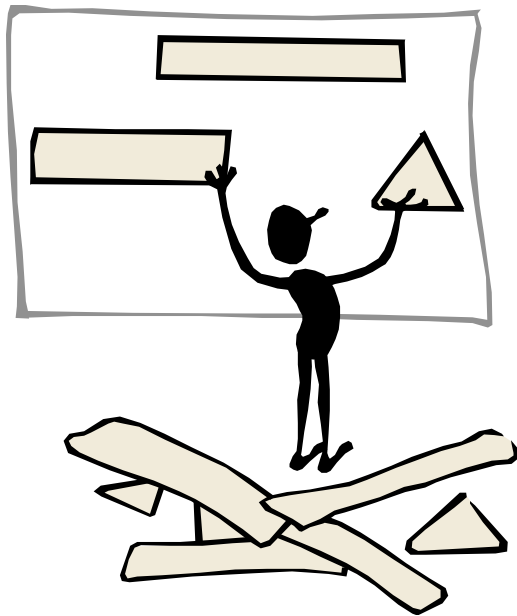
Process Improvement Dilemma

- I have been given the goal of reaching CMMI Maturity Level X by the end of the year and nobody will cooperate with me!

  or

- I just reached my CMMI Maturity Level X last year and now all my programs are backsliding!

- How do I get these programs to follow the processes?!?

Nobody Likes Change

- "I didn't bid CMMI on this job"
  - "What is the cost of CMMI?"
- "I'm behind schedule/working overtime already"
- "I've been doing it this way for years"
- "Everyone already knows what they are suppose to do"
- "This program is an exception/not included in the appraisal"

Most Process Improvement Initiatives Fail

- Process implementers do not believe they need to change
- Management concerns about cost
- Short timeline to achieve goals
- Backsliding after certification

- How is process improvement like a diet?
  - They both start out with good intentions, but eventually fall back into old habits.

- Don't know what they are suppose to do
  - Provide help
- Don't have time or funding to follow processes
  - Show cost benefit of process compliance
- Too wrapped up in addressing a risk or problem
  - Use process to solve their problem
- No one knows they are/aren't following the processes
  - Friendly competition to be more compliant
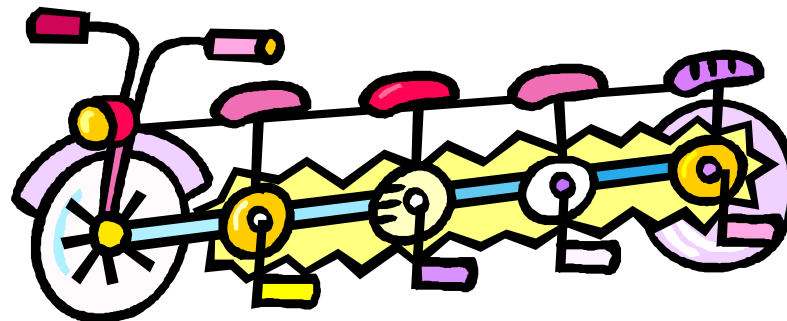
Provide Help - Mentor Don't Police

- Assign 2 QA/Process resources to each program
  - One resource to audit the program's process compliance
  - One resource to mentor the program on process
- Assist program's in defining their process tailoring
- Provide just in time (JIT) training on all new processes/templates
- Attend group meetings
- Explain audit findings and help to create corrective action plans

← Switch Roles by Program →

QA Auditor

Process Mentor

Model the Cost Benefits of Process Compliance

- Return on investment (ROI)
- Need to be able to prove to managers that it will be more costly NOT to follow processes
- Modeling process compliance savings allowing managers to see the cost savings when creating their defined process
 - Note: This is not a ML 4 model

"Large increases in cost with questionable increases in performance can be tolerated only in race horses and women." Lord Kelvin

SW Cost of Quality Model

Use Defined Input:		Defect Estimates:		Cost Estimates:	Proposed	Baseline
44356	SLOC	228.73268	Total Code Defects	Cost of Klocwork	$1,845.21	
$140.00	Labor Cost	28.38784	Defects Removed by Klocwork	Cost of Code Reviews	$21,240.26	
Variable Input:		131.927077	Defects Removed by Code Review	Cost of Test	$155,980.14	$594,826.20
60.00%	% Code Reviewed	56.9811289	Defects Removed during Test	Cost of Fixing Defects Prior to Delivery	$179,065.61	$594,826.20
1	Klocwork	11.436634	Delivered Defects	Cost of Fixing Delivered Defects	$156,533.21	$0.00
5.00%	% Delivered Defects			Total Cost of Removing Code Defects	$335,598.82	$594,826.20

Where Defects Detected

- Delivered Defects
- Defects Removed during Test
- Defects Removed by Code Review
- Defects Removed by Klocwork

Cost of Defect Removal

- Cost of Fixing Delivered Defects
- Cost of Test
- Cost of Code Reviews
- Cost of Klocwork
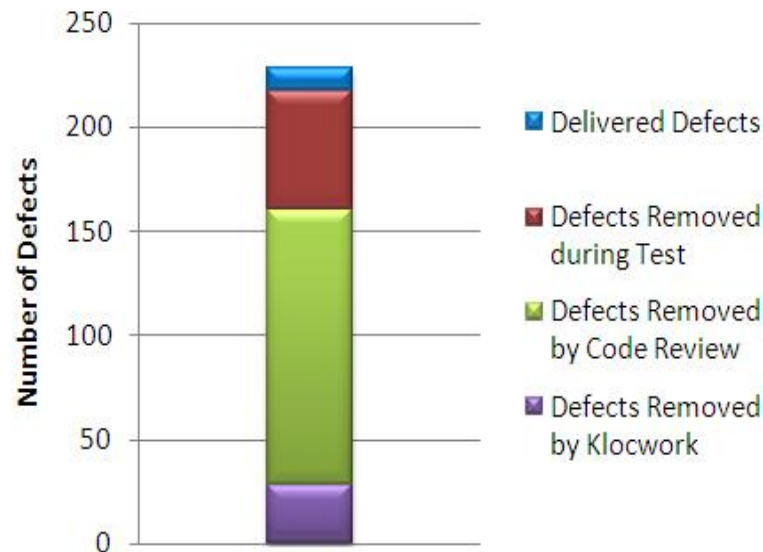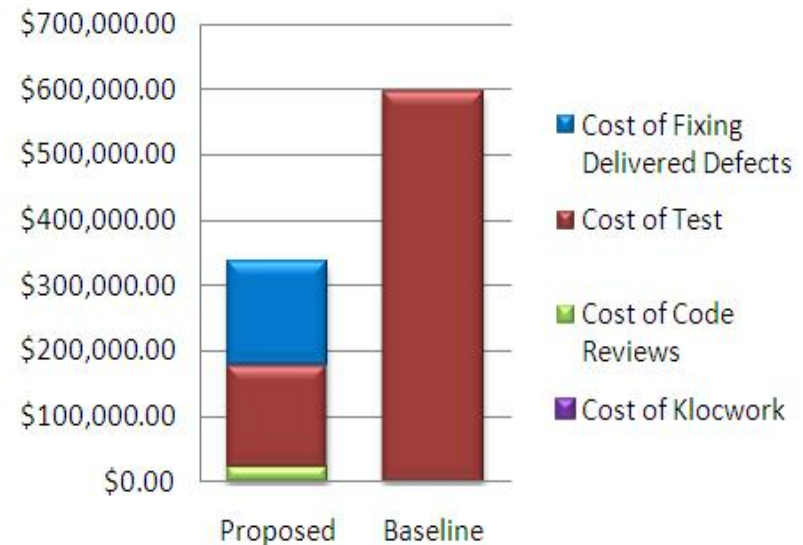
What You Need to Know

- Program size in Source Lines of Code (SLOC)
  - Use code counting tool
- Total coding defects on the program
  - Need to have program collect this
- % SLOC reviewed
  - Include in minutes
- Defects found at code reviews
  - Include in minutes
- Time spent in code reviews
  - Prep & meeting time (include in minutes)
- Time spent testing
  - Mine from existing programs
- Time spent fixing defects after SW delivery
  - Mine from existing programs
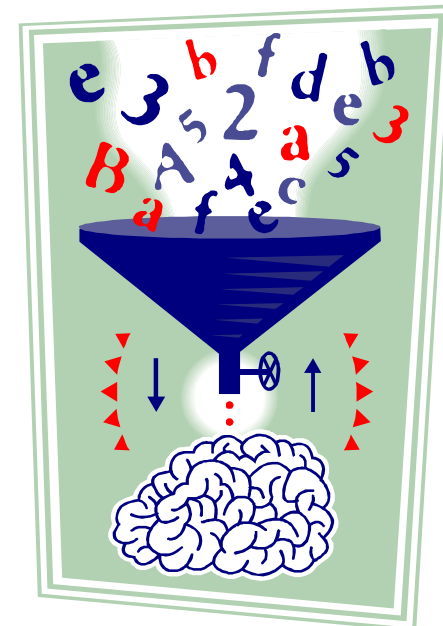
- Need to be able to predict the number of defects on the program
- Estimate the number of defects removed by each event
  - What % defects do you remove by code review?
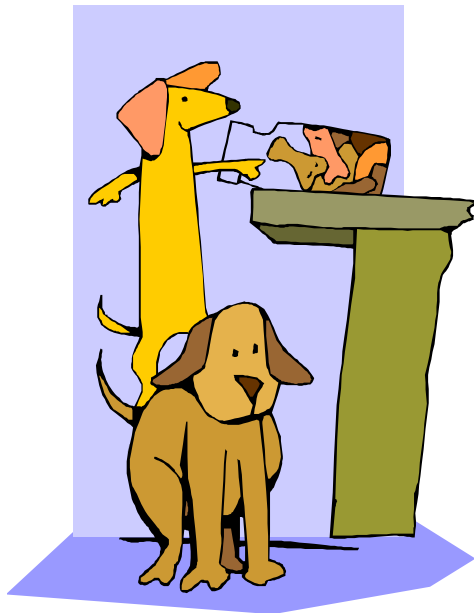 - Do you need to remove all defects prior to delivery?
  - Test
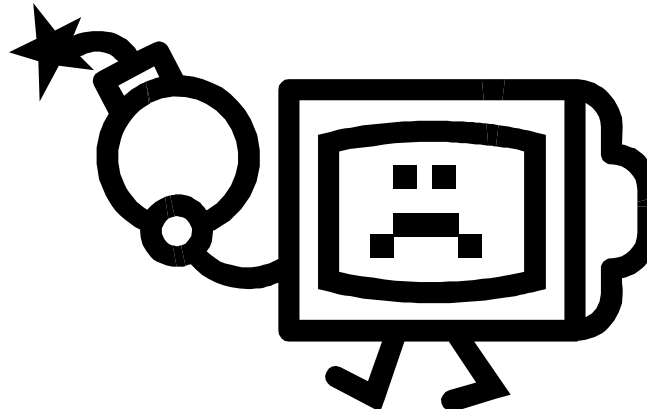
- Estimate the time of removing those defects at different lifecycle events
  - Code review
  - Test
  - After delivery
- Allow program to enter labor cost and multiply time by labor to get cost

Solve a Problem

- **Actual NRE exceeding estimated NRE**
  - Design to cost
- **System testing overruns due to run time errors**
  - Derive SW & HW requirements from a system performance requirement
- **Actual labor costs exceed estimated labor costs**
  - Establish database of historical performance for use on future programs

- Monthly reports:
  - Report program process compliance to management in an easy to understand stoplight chart
    - Programs compete on process compliance

| Current State of SEP Compliance											Overall	Compliance Rating
Process Audit:	PP	PMC	SM	CM	Sys	HW	SW	PI	PW	spare	spare		
Process Coverage:	100%	52%	58%	32%	22%	0%	0%	0%	0%			28%	
Process Performance Rating:	100%	91%	100%	100%	88%	-	-	-	-	-	-	96%	2

Engineering Issues: no evidence of defects being tracked to closure, BDTM incomplete
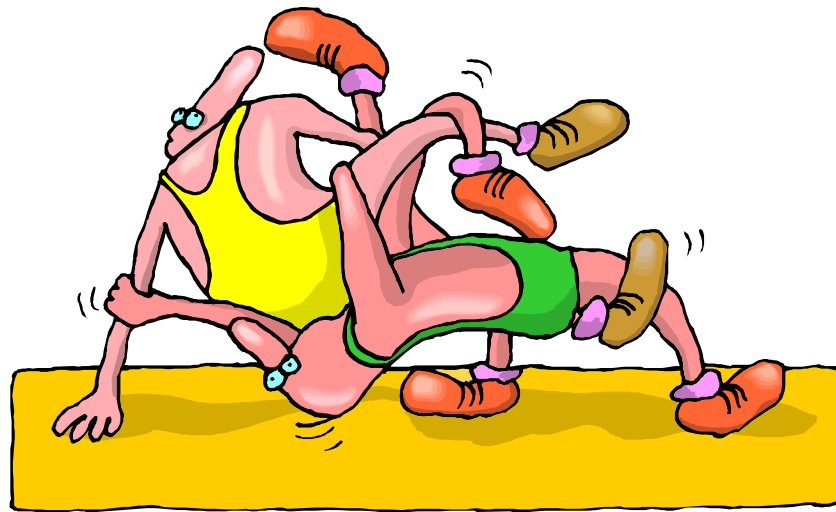
QA Audit Findings

•Perform trend analysis on findings and address issues across programs
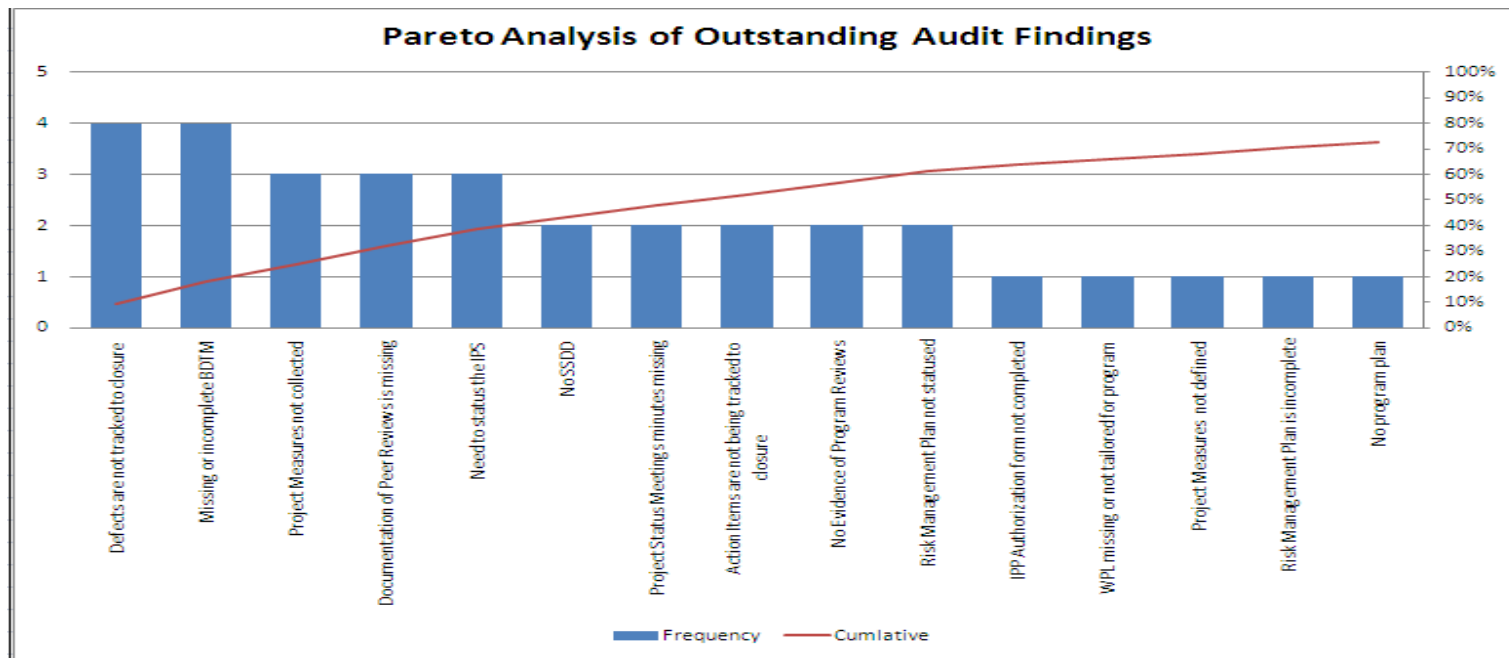
**"If you can not measure it, you can not improve it."
Lord Kelvin**

Summary

- Understand that process improvement changes are disruptive to process practitioners
  - Provide mentoring to make process compliance easier to understand
- Compute ROI for process changes
  - Prove to program managers that process compliance is cost effective
  - Facilitates process tailoring
- Use processes to solve program problems
  - Process is the solution not the problem
- Measure process compliance and report it regularly at meetings with program resources and upper management
  - Process compliance included in annual goals
  - Programs compete on process compliance
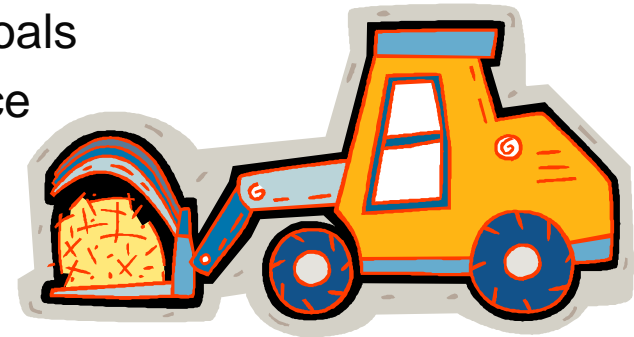
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Back Up Slides

Further Assistance in Computing Cost Models

Estimate Defects

- Need to be able to predict the number of defects on the program
  - Average
    - Total coding defects from a program / SLOC
  - Regression equation
- Estimate the number of defects removed by each event
  - What % defects do you remove by code review?
    - Average
      - Program X reviewed 50% of their code and found 65% of their defects
      - 65%/50% = 130% (average this across programs)
      - Multiply the % code reviewed by 130% to find out what percentage of defects are removed by code review
    - Regression equation
  - Do you need to remove all defects prior to delivery?
    - Allow the user to define what percentage of defects will not be fixed prior to delivery
  - Test
    - All defects not removed from code review or delivered to the customer are removed during test
    - Time by type of test event (unit, integration, system)

Estimating Cost

- Estimate the time of removing those defects at different lifecycle events
  - Code review
    - Average program found 1 defect per hour at code review
    - Estimate cost of fixing code defect
    - Total time = code review + fixing time
  - Test
    - Time SW engineers spent in testing divided by the number of defects they removed
  - After delivery
    - Same as above, but for a post delivery cycle
- Allow program to enter labor cost and multiply time by labor to get cost