

Implementing a Plan for Controlling Program ROI for CMMI[®] Process Improvement

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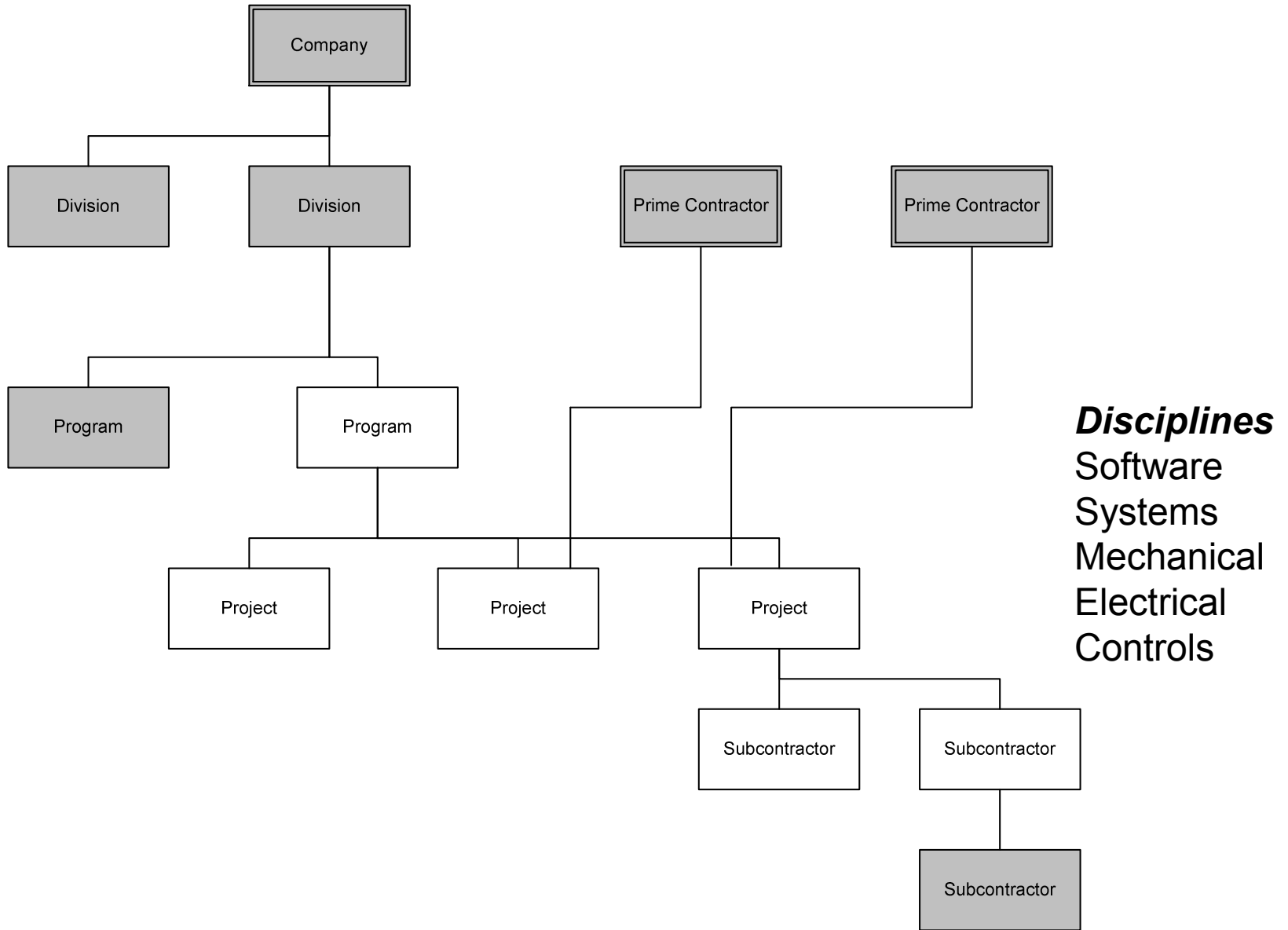
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Objectives

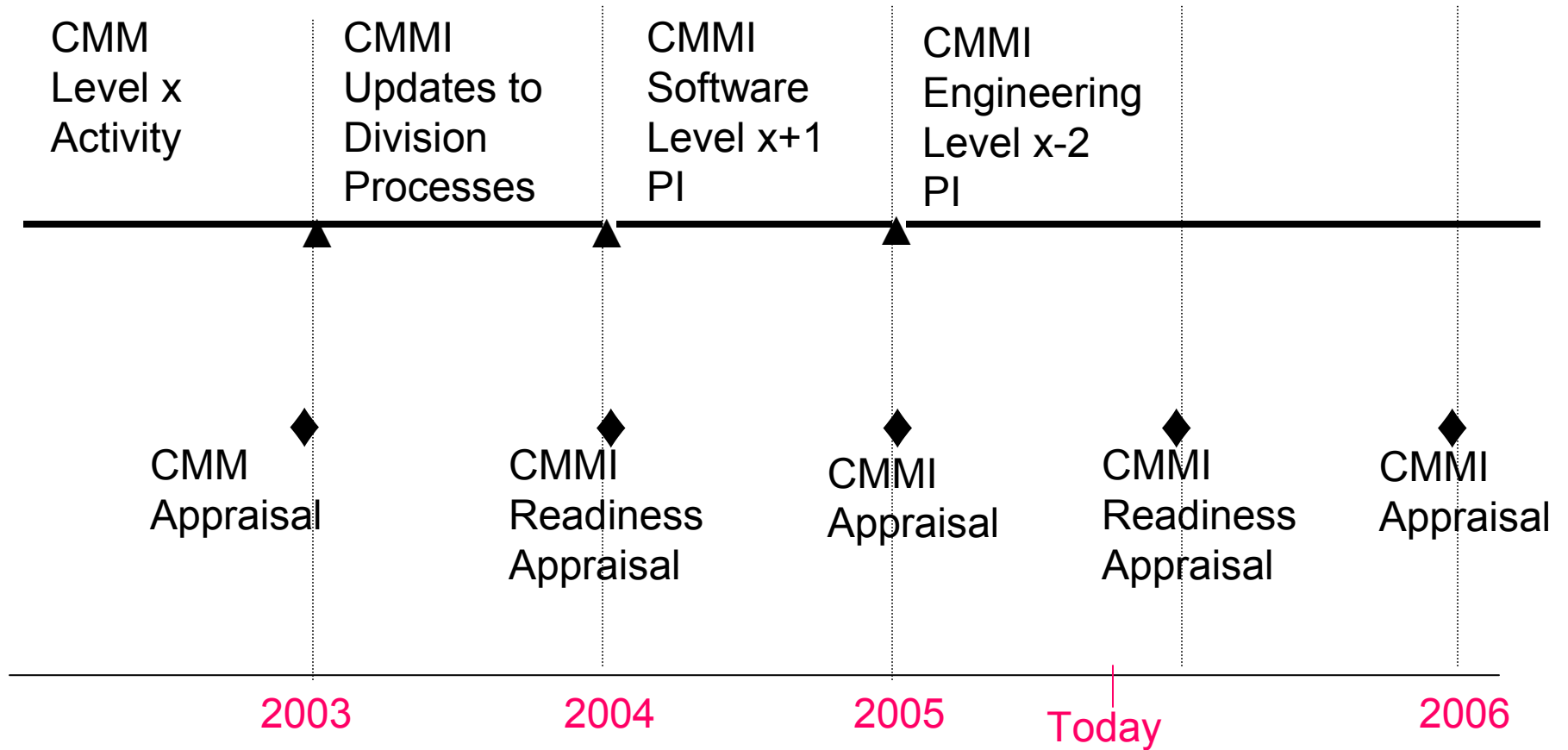
Use 'ROI' as a measure for

- Understanding and quantifying the benefits/losses of Process Improvement (PI) and Process (P) performance for the Program
 - Support decisions in planning and performing PI and P
 - Increase efficiency of Process Improvement (PI) and Process (P)

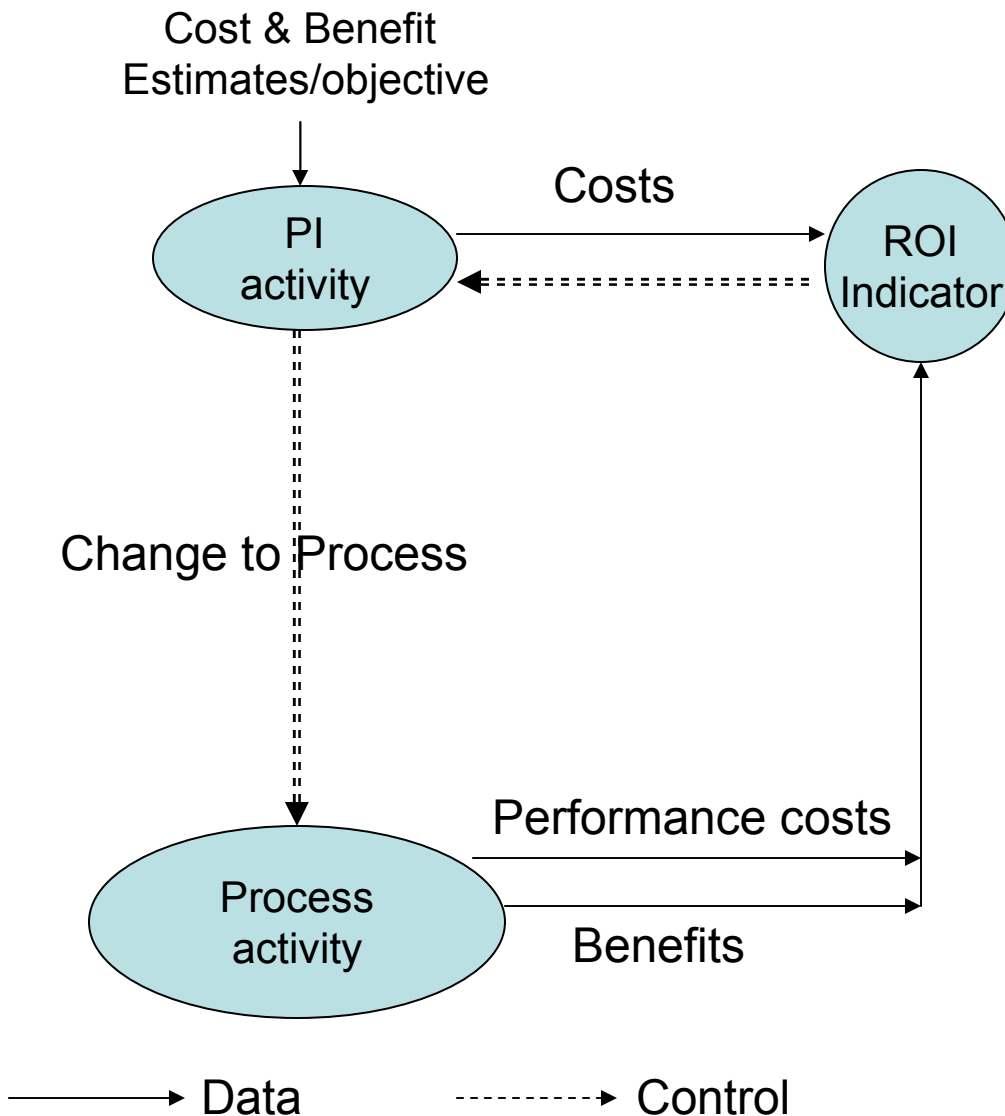
Context



Process Milestones



Manage ROI



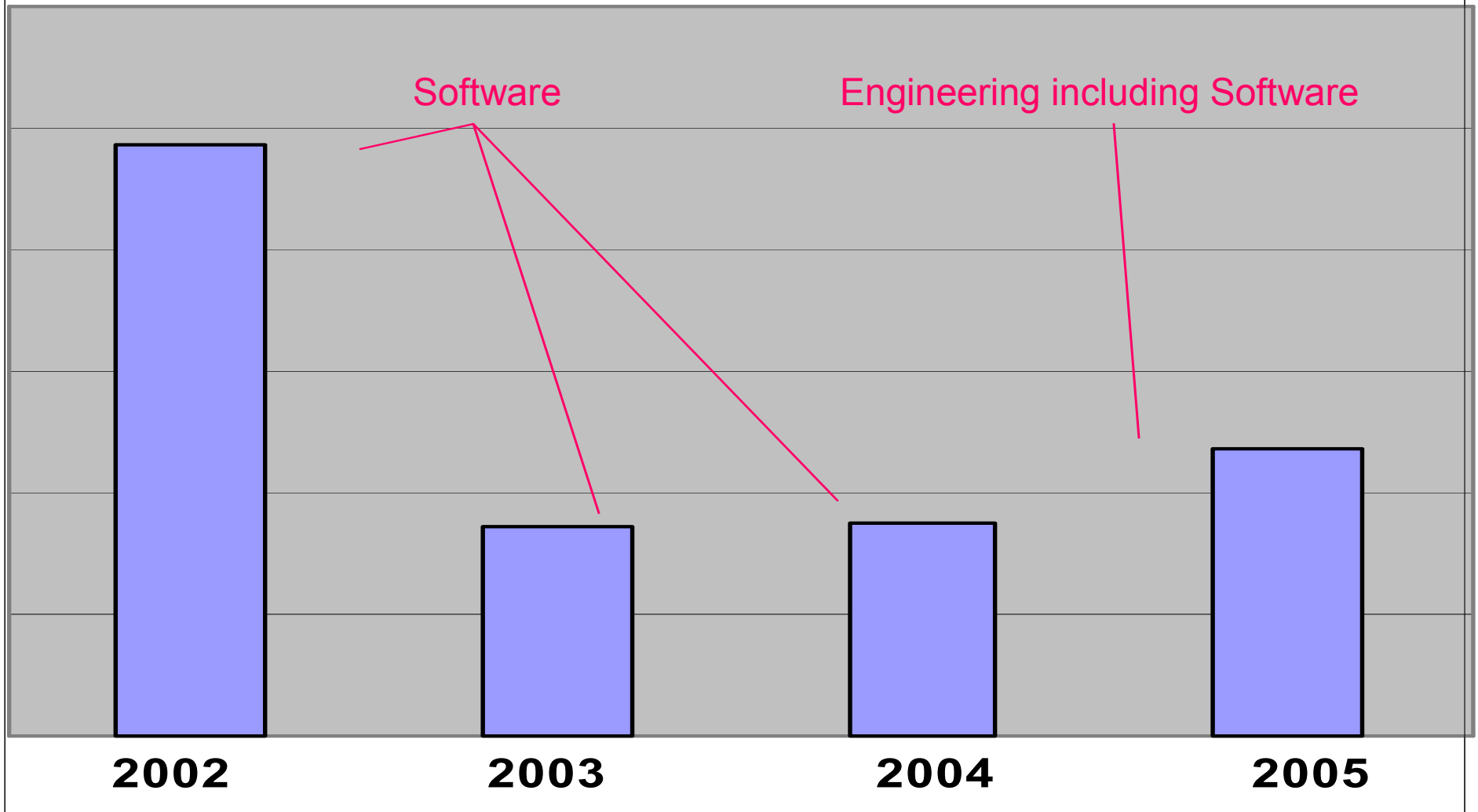
- Actual Costs**
- Management
 - Process Development
 - Training
 - Compliance
 - Appraisals
 - Execution

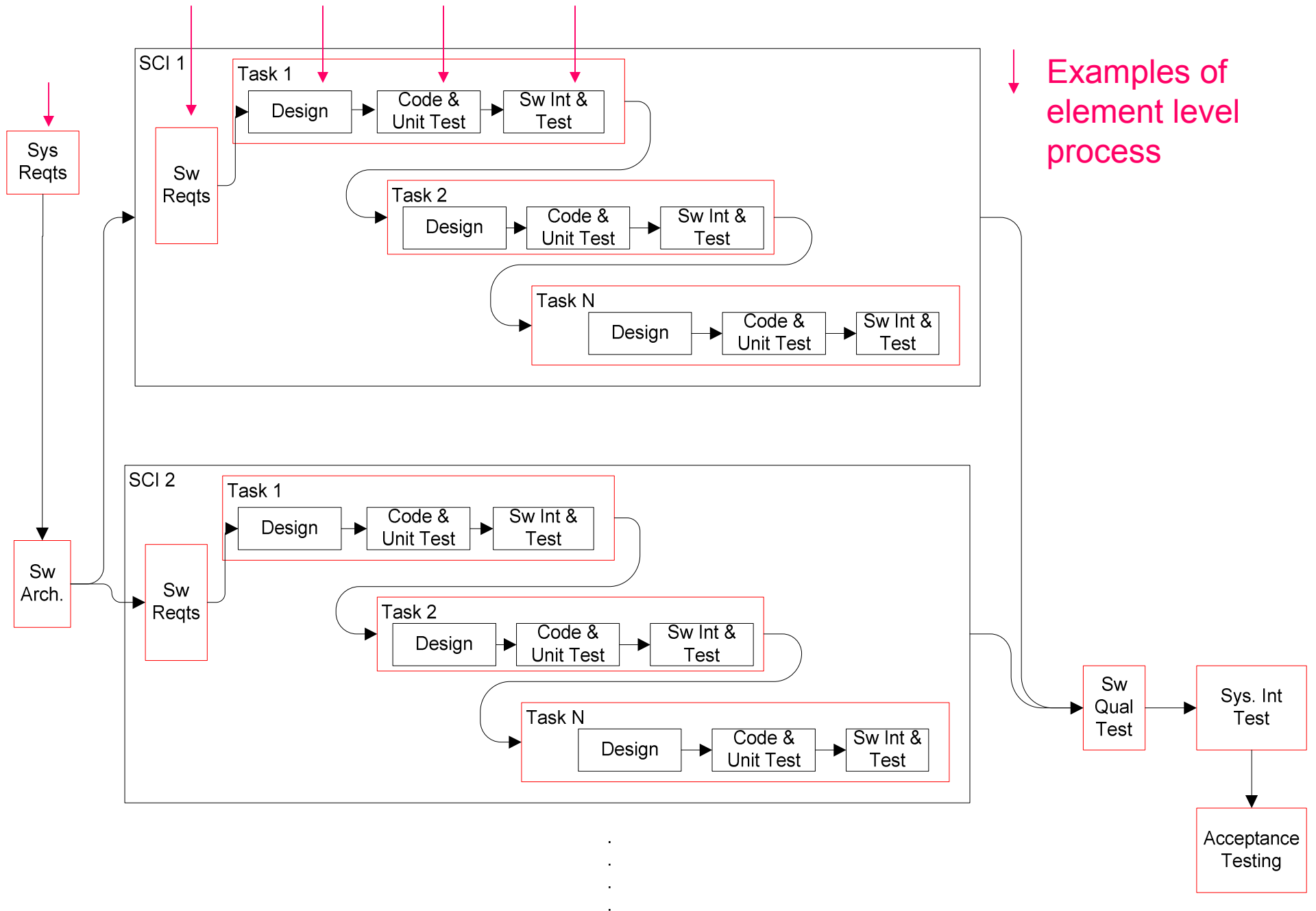
- Actual Benefits**
- productivity gain
 - effort decrease
 - cycle time decrease
 - rework decrease
 - quality gain

Approach

- Benefits of the CMMI
 - Aggregate benefits at the process element level from CMMI-based improvements
 - Define ‘goodness’ measure for a process element
 - Measurements before, during, after the improvements

Process Improvement Costs (Hours)





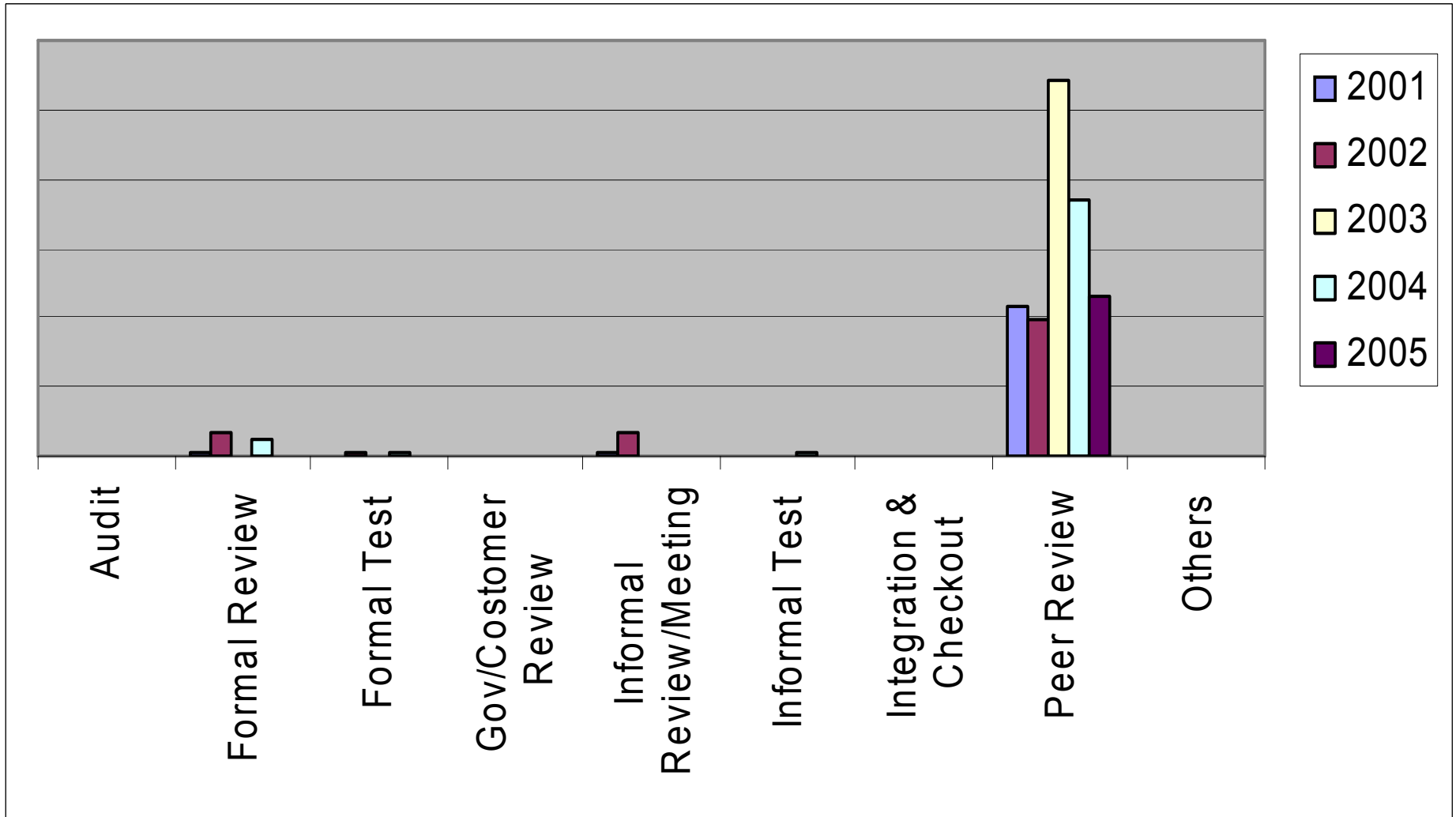
Process Element Example

- Peer reviews
- 'Goodness'
 - Early identification of defects
 - Number of defects missed
 - Time to close defects
 - Predictability

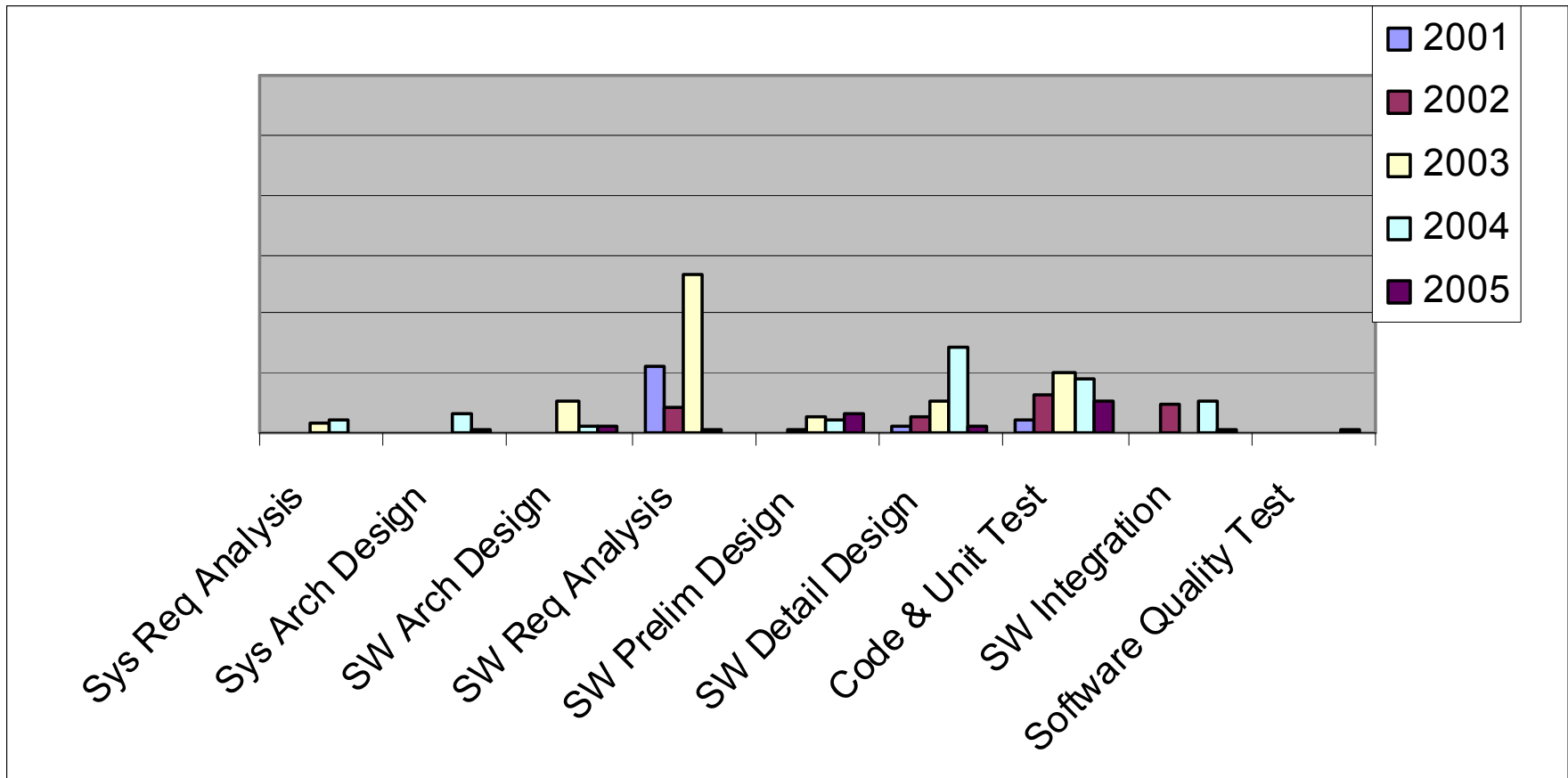
Data Categories for Defects

- Defects (Peer Review)
- Change requests
 - Developmental (CUT)
 - Formal (Test)
- Issues

Finding Defects

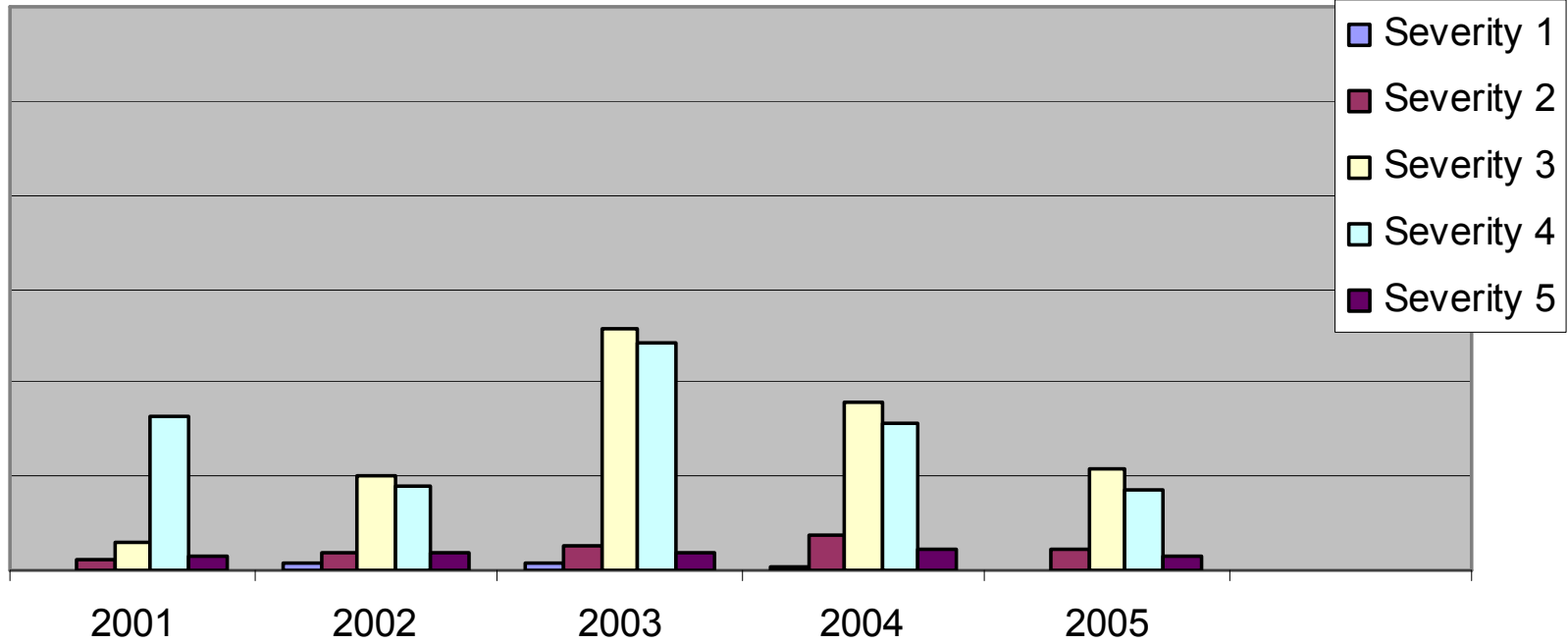


Defect Origin

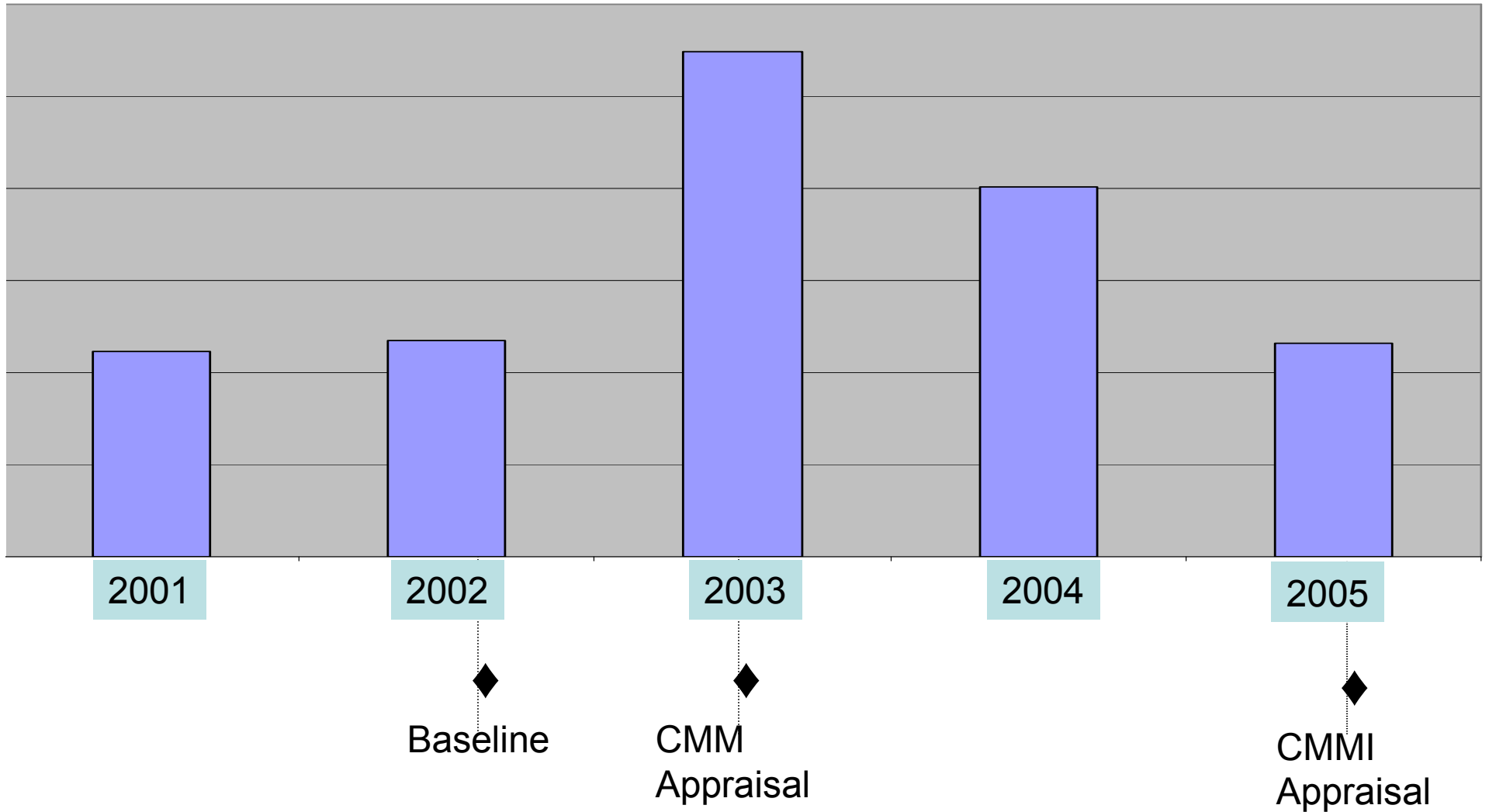


Severity Occurrence

Severity Occurrence

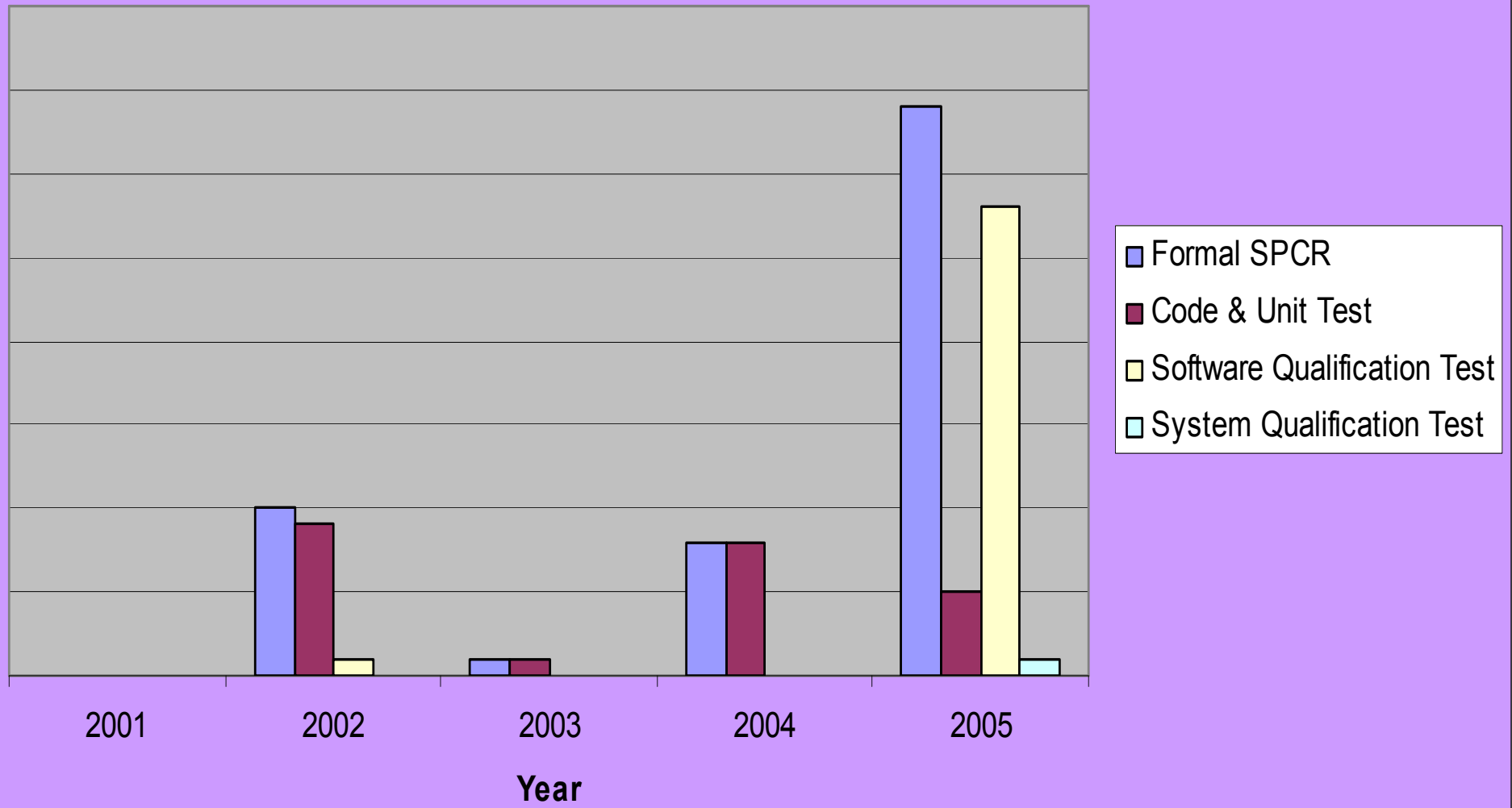


Peer Review Defect Data

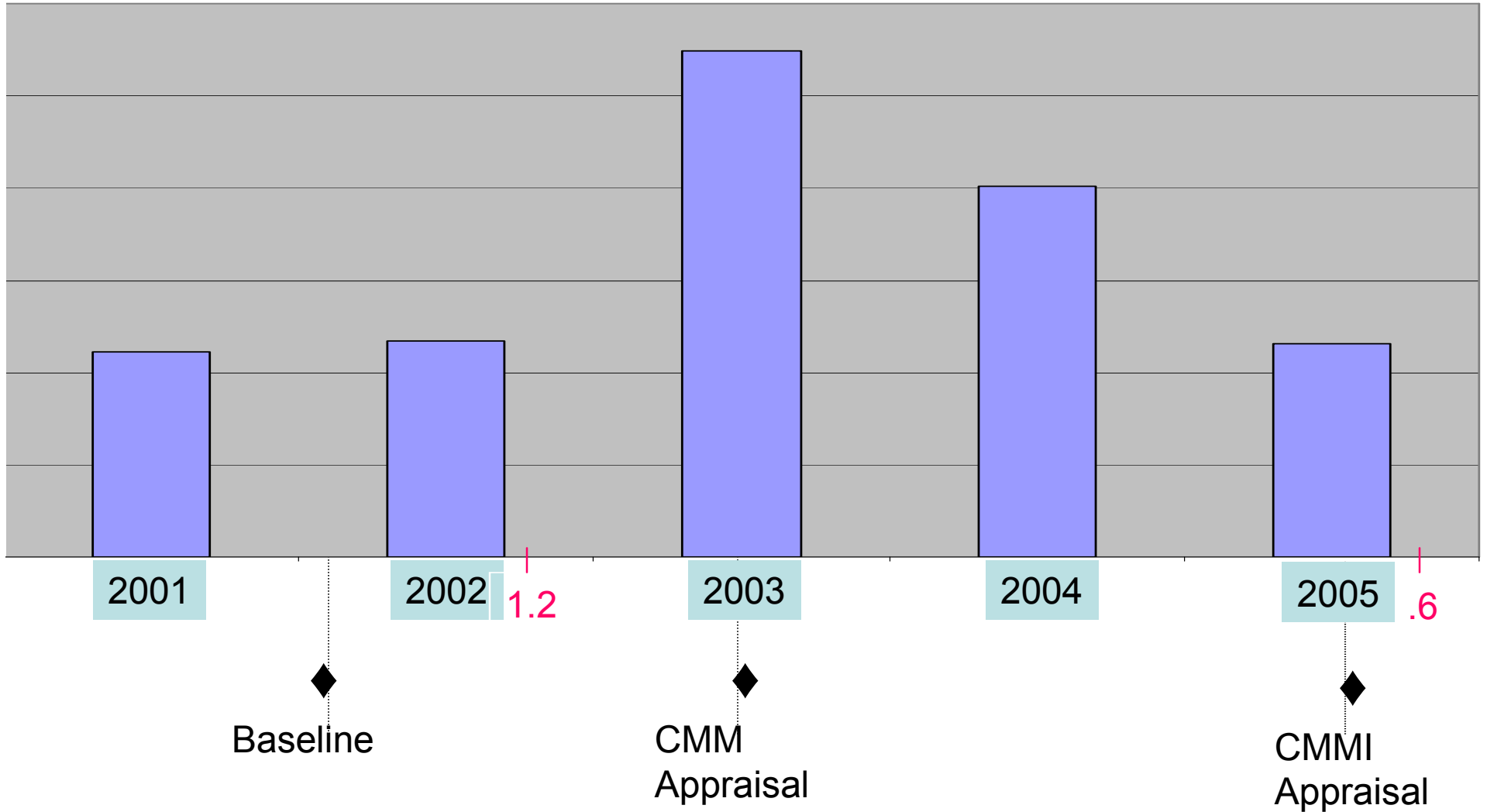


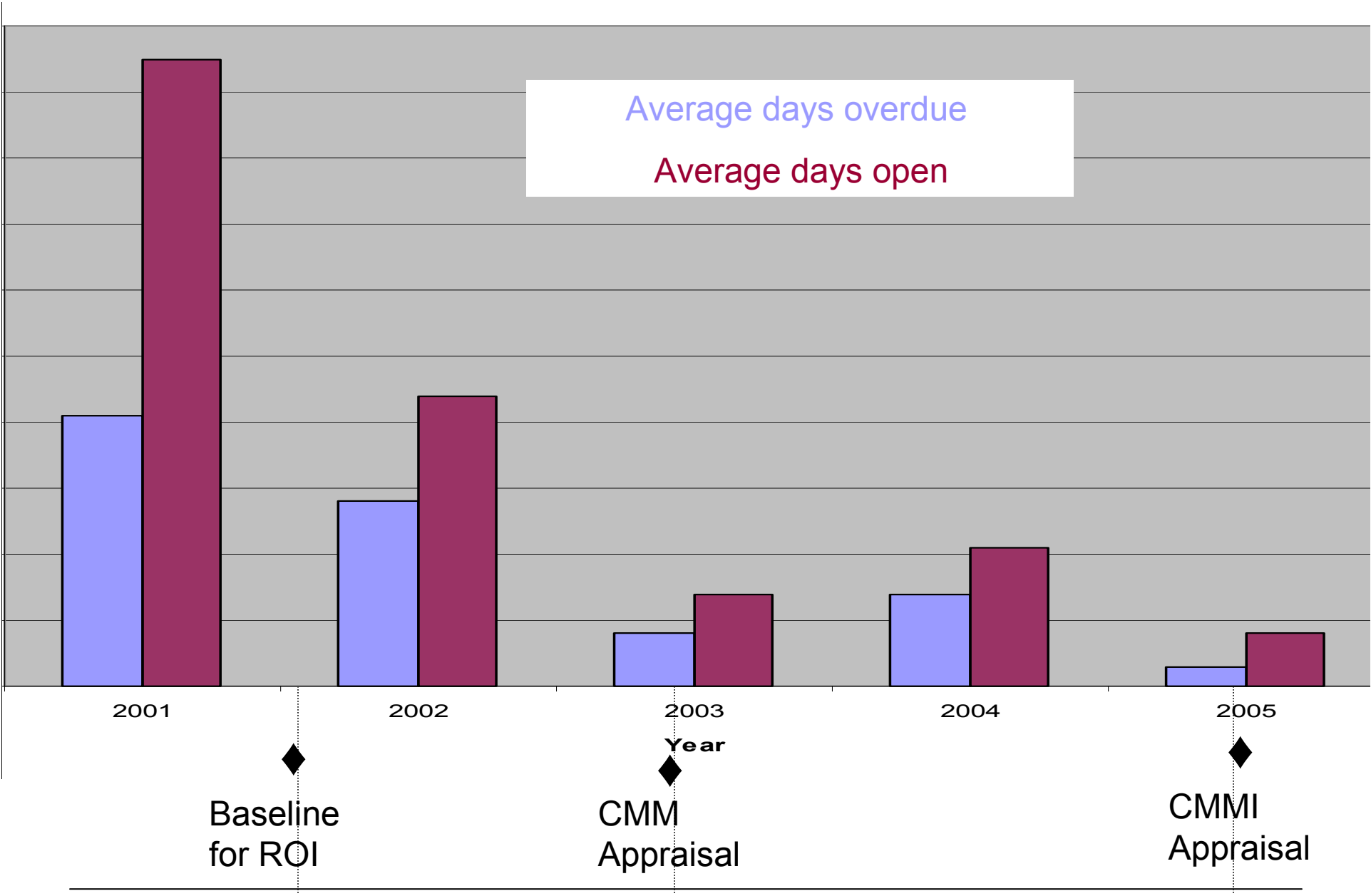
Formal SPCR & Test

Note: Scale is approx. 30 x smaller than previous charts



Peer Review Defect Data





Average days overdue

Average days open

2001

2002

2003

2004

2005

Year

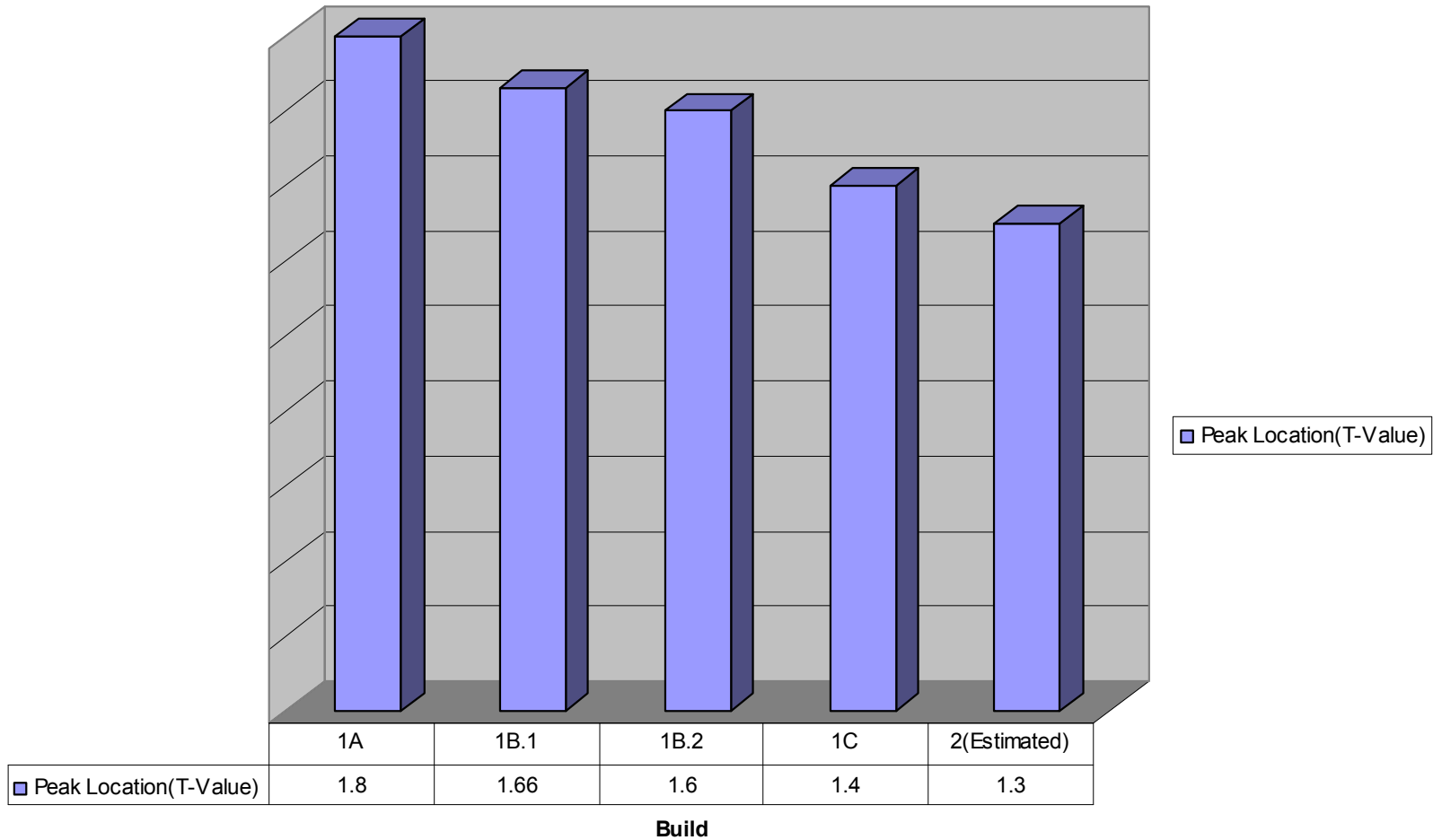
Baseline
for ROI

CMM
Appraisal

CMMI
Appraisal

Sweep Peak (T) Value

Peak Location(T-Value)



Estimated Total Errors: 798.36

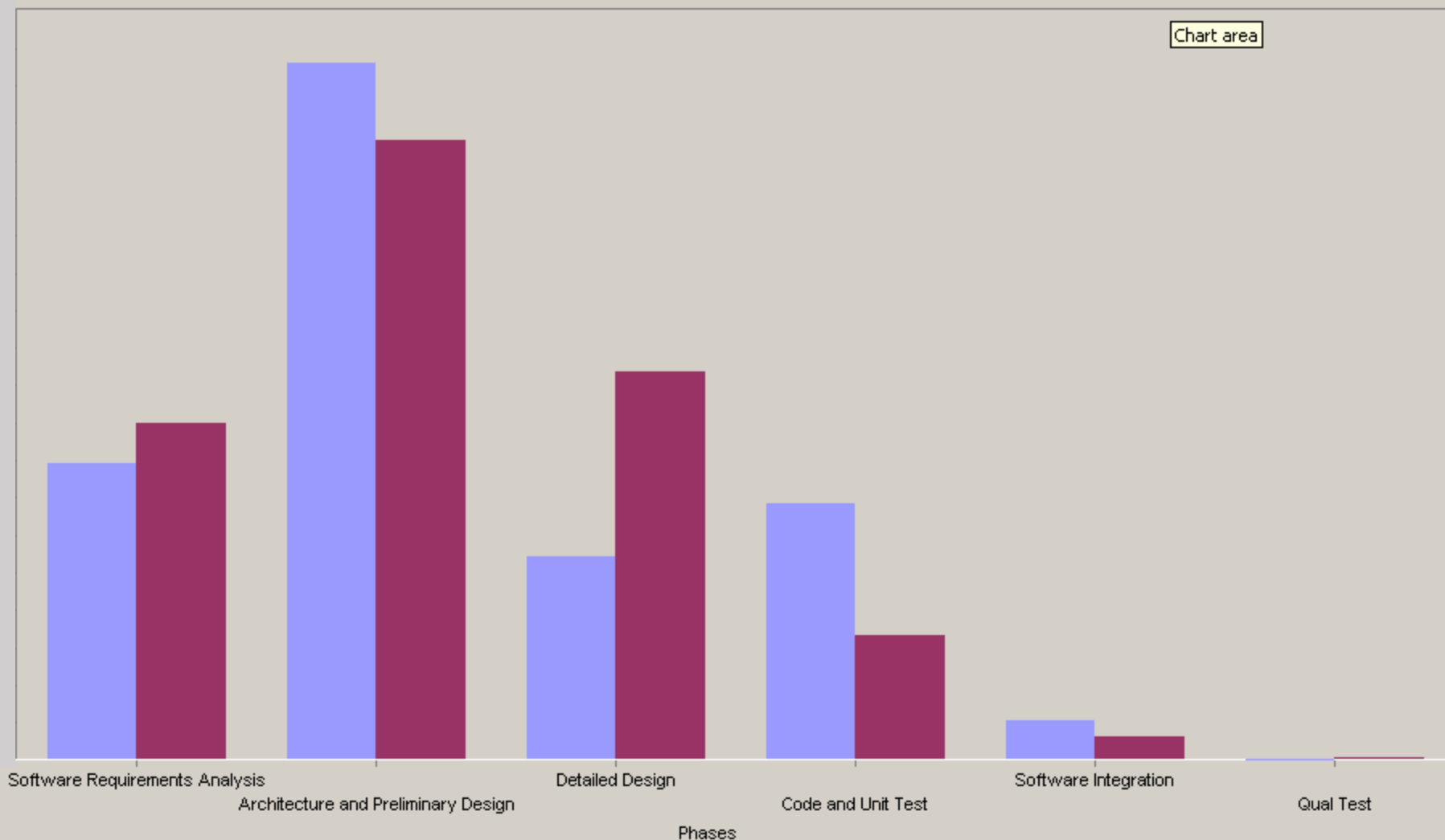
Selected Peak Location: 1.4

Selected Latent Errors: 0.082

Error Discovery Efficiency: 99.99%



SWEEP v4.1 - BldA - Error Discovery Data and Rayleigh Fitted Histograms



Actual █ Estimated

Close

Estimated Total Errors: 2430.08

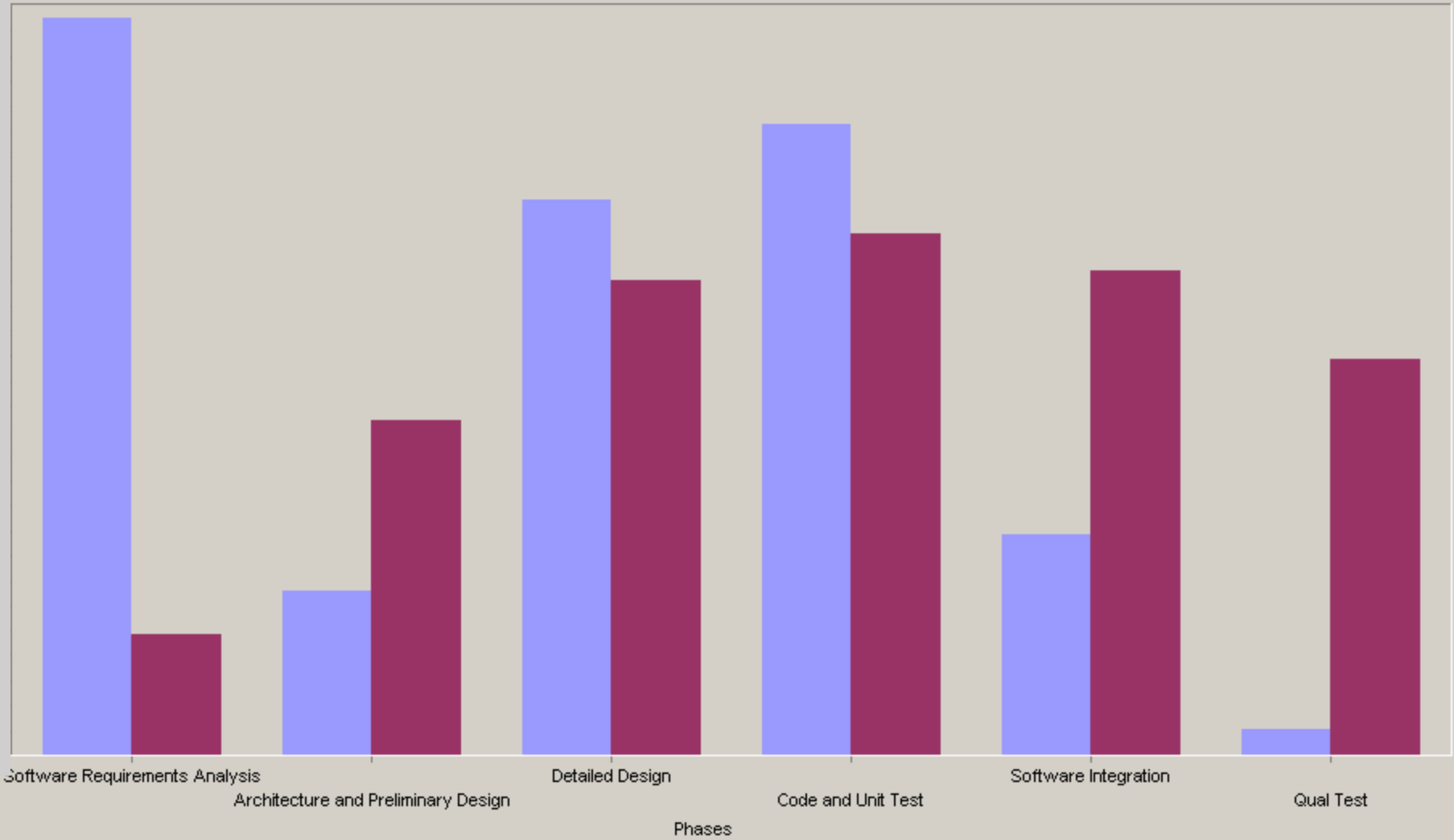
Selected Peak Location: 3.5

Projected Latent Errors: 559.0794

Error Discovery Efficiency: 76.99%



SWEEP v4.1 - EMD - Error Discovery Data and Rayleigh Fitted Histograms



Actual Estimated

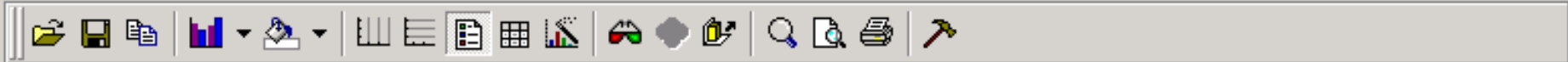
Close

Estimated Total Errors: 1065.83

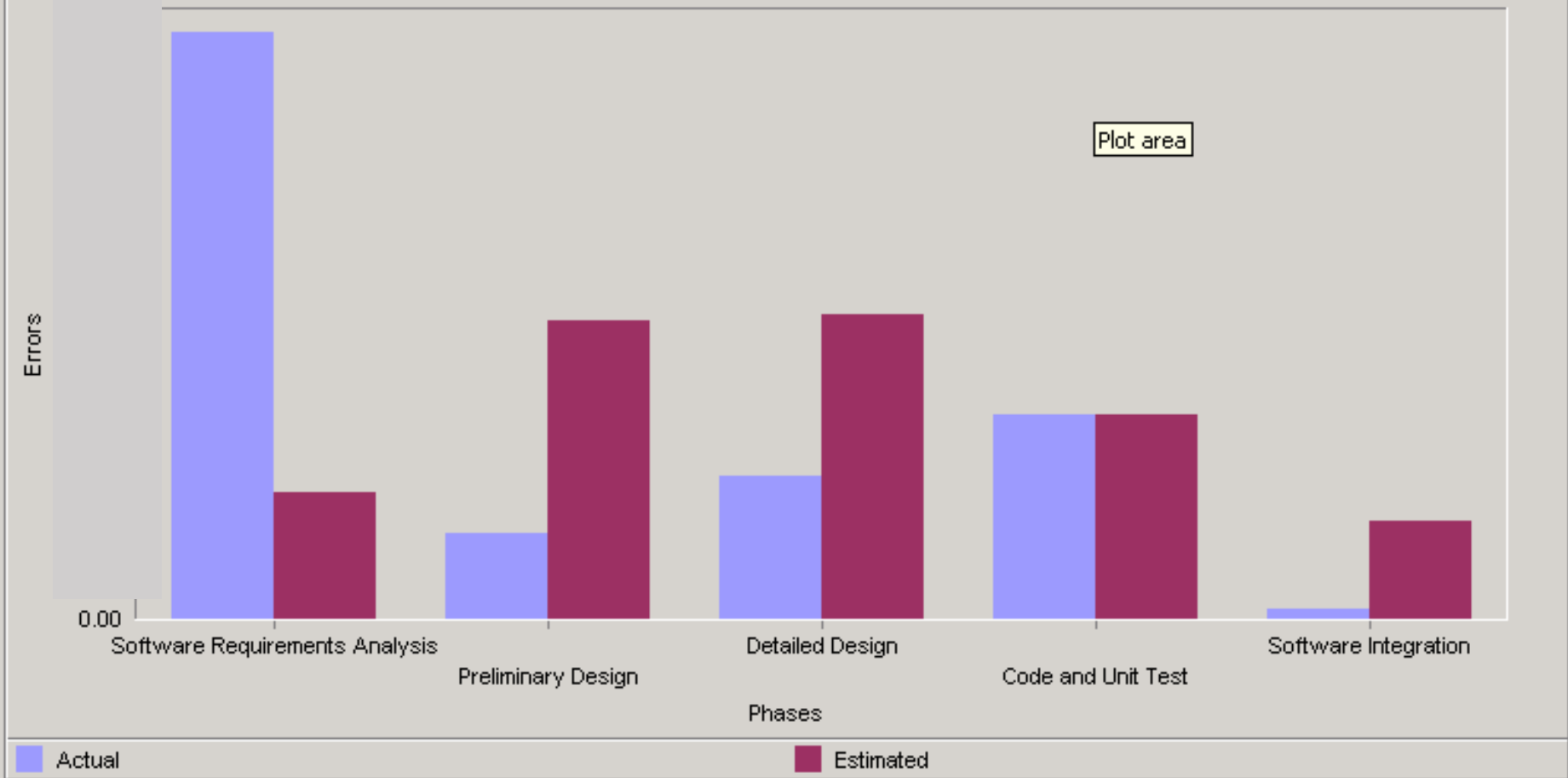
Selected Peak Location: 2

Projected Latent Errors: 46.8293

Error Discovery Efficiency: 95.61%



SWEEP v4.1 - Examine - Error Discovery Data and Rayleigh Fitted Histograms



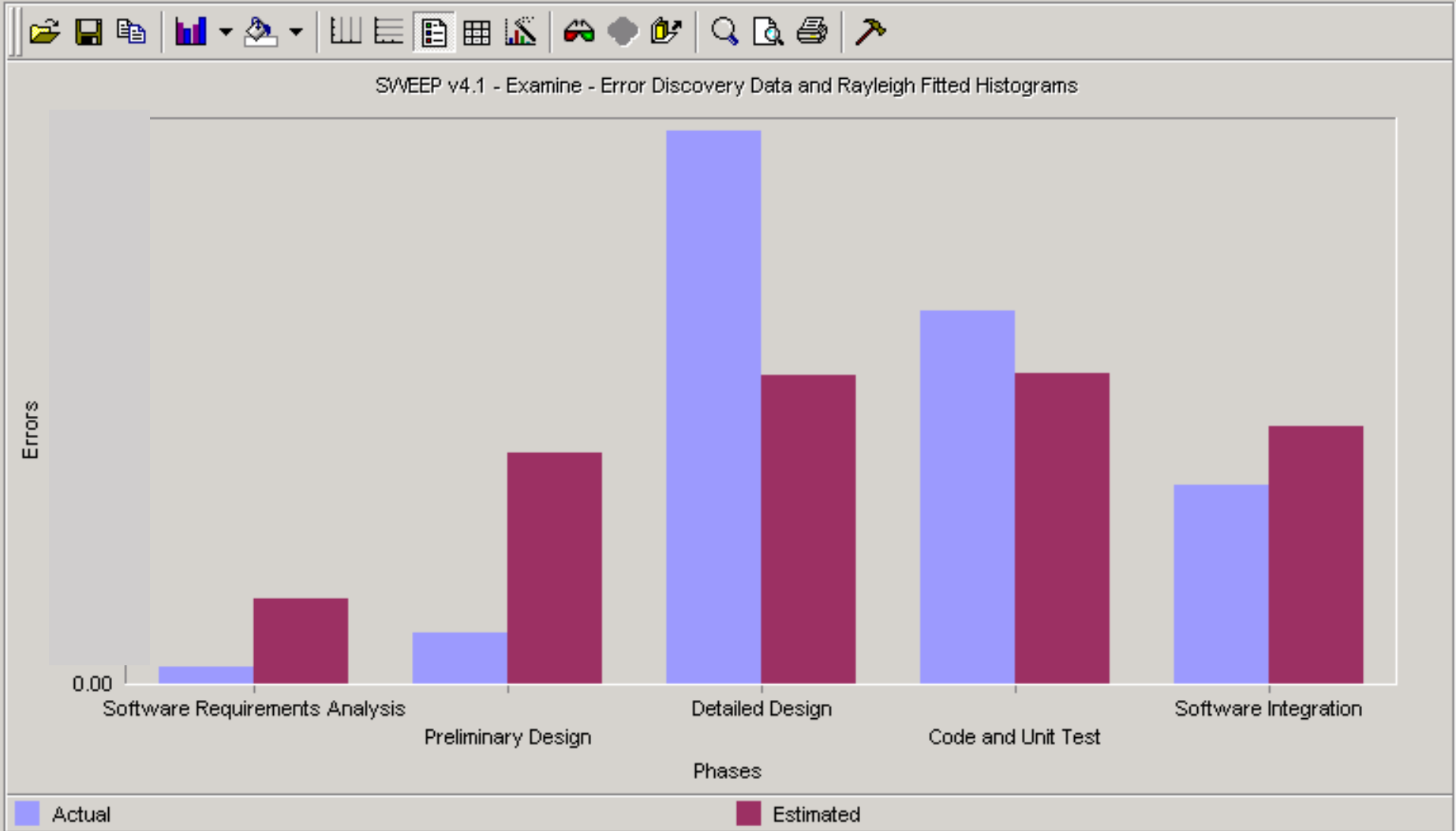
Close

Estimated Total Errors: 848.6

Selected Peak Location: 3

Projected Latent Errors: 211.6004

Error Discovery Efficiency: 75.06%



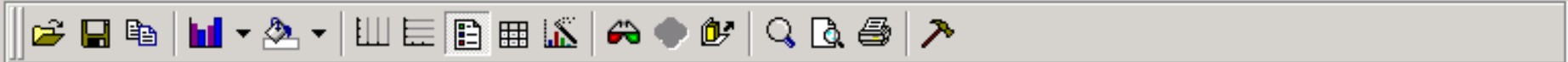
Close

Estimated Total Errors: 493.05

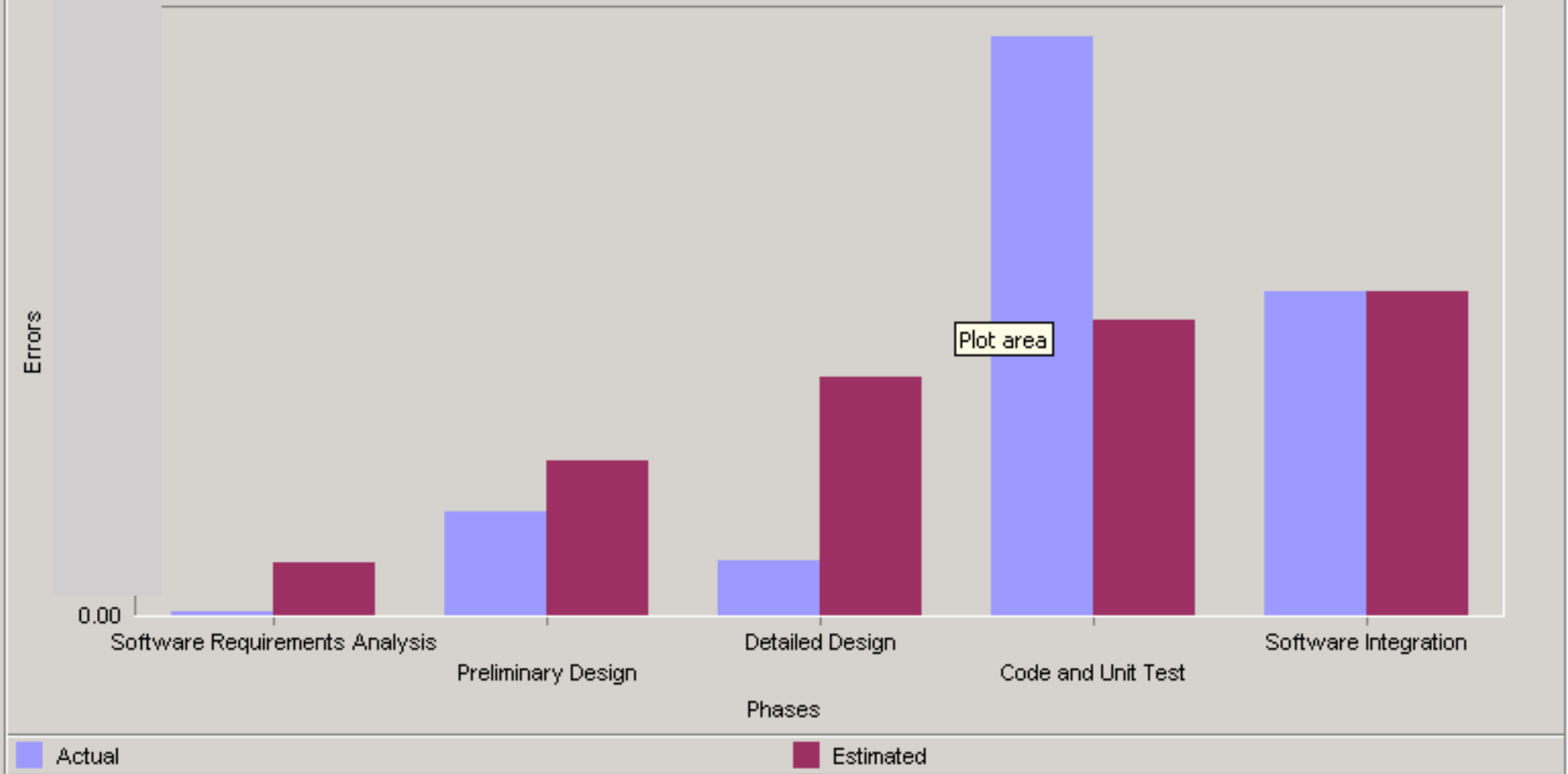
Selected Peak Location: 5

Projected Latent Errors: 299.0499

Error Discovery Efficiency: 39.35%



SWEEP v4.1 - Examine - Error Discovery Data and Rayleigh Fitted Histograms



Close

Benefits / ROI

- Earlier detection of defects
 - 1.2 defects per ksloc to .6 defects per ksloc at Software Integration and Test
- Time to close defects decreasing
- Number of issues declining
- ROI using cost of all Process Improvement and only defect related benefits (ignoring all other benefits) = 1.6

Summary

- Single program
- Trend data from 2002 to 2005
 - CMM Level 3 (2002-2003)
 - CMM Level 4 (2003-2005)
 - CMMI Level 5 (2005-)
- Examined defect data
- Defect benefit / Total PI cost = 1.6