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Get It Sold, Keep It Sold

Making the Business Case for High Maturity
November 17, 2010

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Warm & Fuzzy Prospects . . .

. . . may initially attract management's attention, but they will soon be asking, "What's in it for me?"

CMMI Performance Results Summary

Performance Category	Median Improvement	Number of Data Points	Lowest Improvement	Highest Improvement
Cost	34%	29	3%	87%
Schedule	50%	22	2%	95%
Productivity	61%	20	11%	329%
Quality	48%	34	2%	132%
Customer Satisfaction	14%	7	-4%	55%
Return on Investment	4.0 : 1	22	1.7 : 1	27.7 : 1

Note: The performance results in this table express change over varying periods of time.

Source: Gibson, Goldenson & Kost, "Performance Results of CMMI-Based Process Improvement," CMU/SEI-2006-TR-004, August, 2006.

This Is Your Opportunity to Market!

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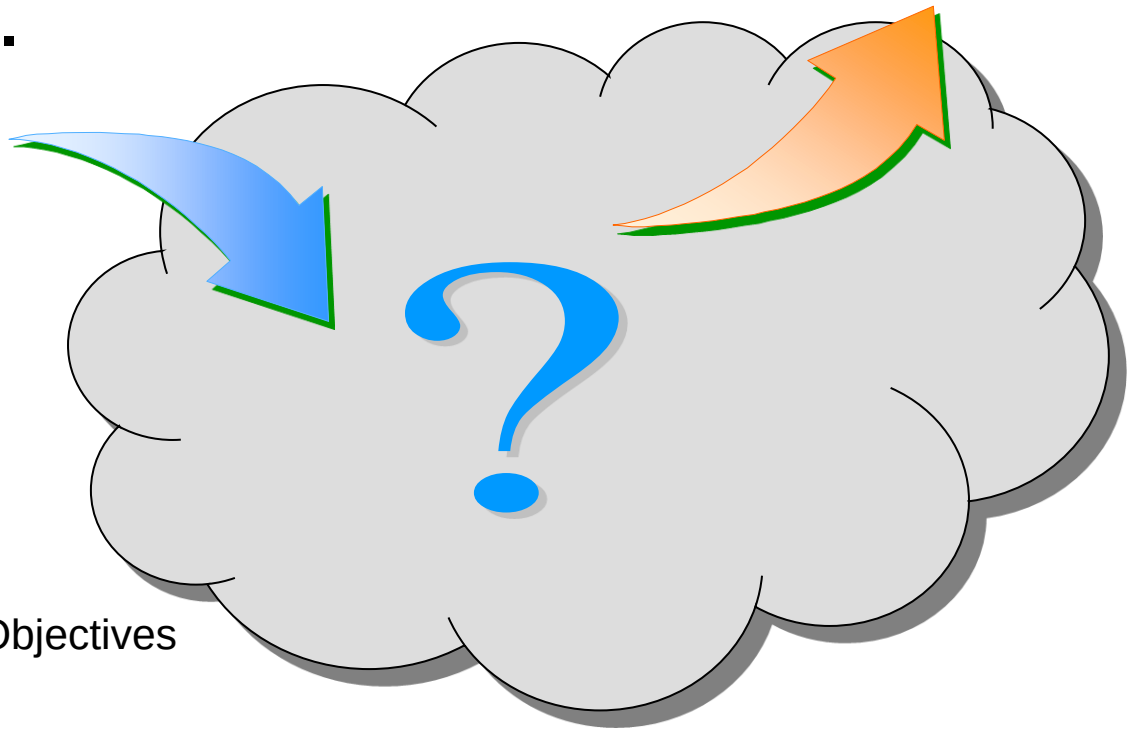
. . . How do you make the business case for High Maturity

Given this . . .



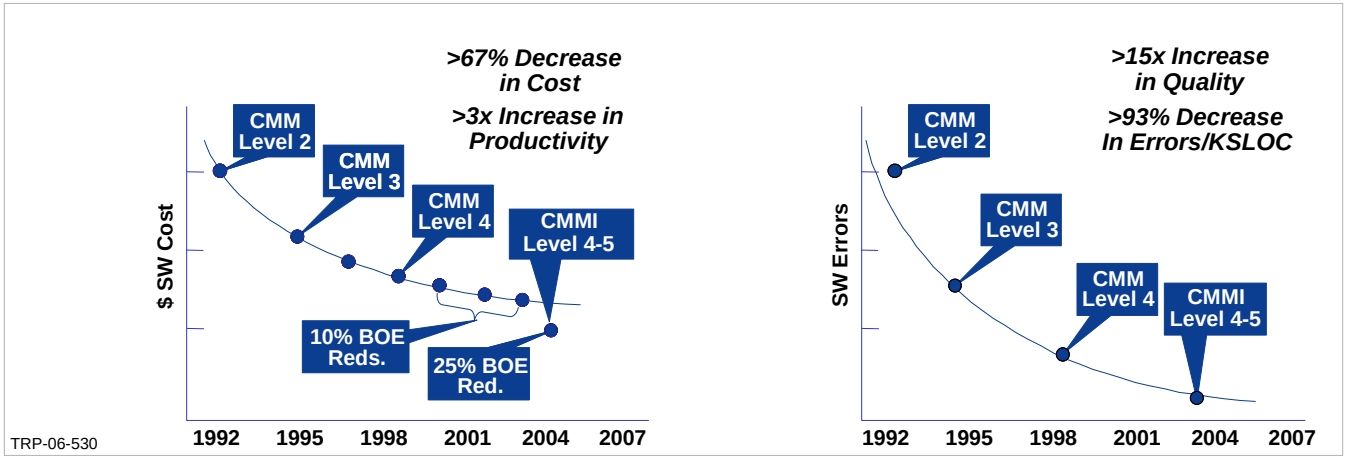
Organizational Goals & Objectives
Competing Resources
Cost Constraints
Competing Improvement Opportunities

You Need a Structured Methodology to Market the Value

3

Getting Past the Warm & Fuzzies

- Locate the opportunities
- Rank the candidates objectively
- Plan to execute successfully
- Capture & market the results
- Make it permanent



Good Engineers Use Trade Studies

Use this…

. . . To make the business case for High Maturity

Given this . . .

Organizational Goals & Objectives
Competing Resources
Cost Constraints
Competing Improvement Opportunities

Identify, Quantify & Prioritize Improvement Opportunities

Align Business Goals with the Work

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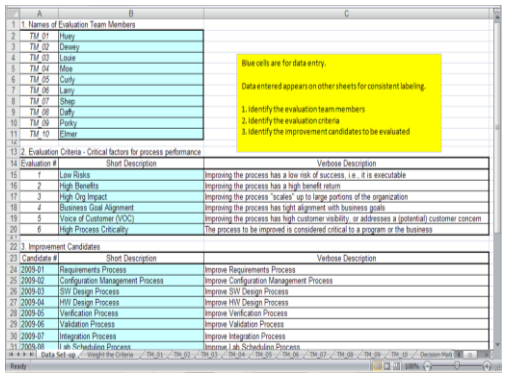
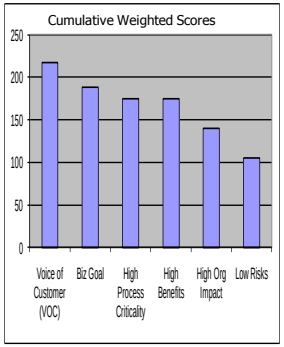
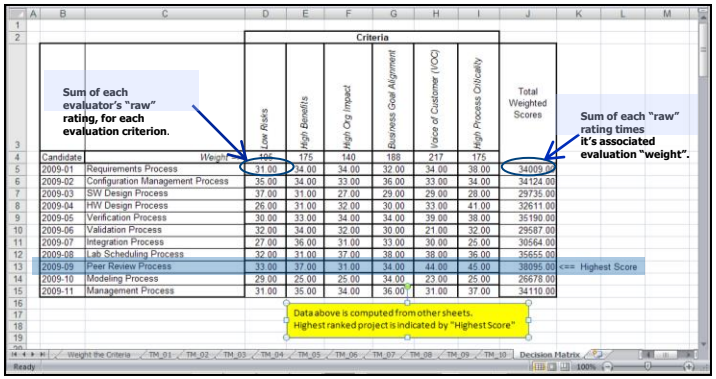
Locate the Opportunities

Choose the Right Projects



	Criteria							
Evaluator	Low Risks	High Benefits	High Org Impact	Business Goal Alignment	Voice of Customer (VOC)	High Process Criticality	sum	check
Director 1	20	20	10	20	20	10	100	ok
Director 2	10	10	20	10	20	30	100	ok
Director 3	15	15	15	30	10	15	100	ok
Director 4	10	15	10	15	20	30	100	ok
Director 5	15	15	25	20	25	0	100	ok
Director 6	5	15	20	23	22	15	100	ok
Director 7	10	20	15	25	15	15	100	ok
Director 8	5	15	10	20	25	25	100	ok
Director 9	5	10	10	20	30	25	100	ok
Director 10	10	40	5	5	30	10	100	ok
Total	105	175	140	188	217	175		





Identify owning Directors, proposals and evaluation criteria

Weight the evaluation criteria

Rank & score the candidates to determine the best process improvements to work

Rank the Candidates Objectively

Plan Obsessively

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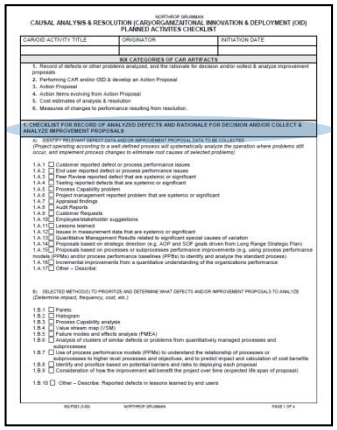
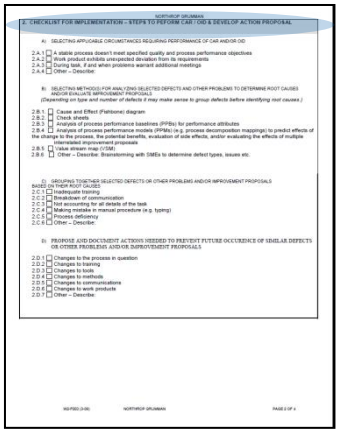
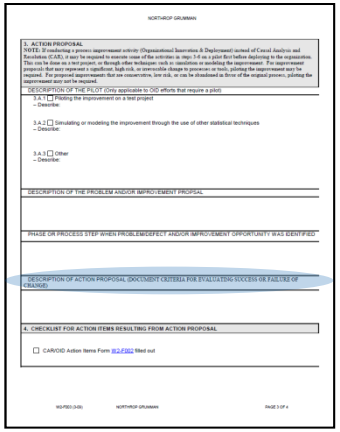

CAUSAL ANALYSIS & RESOLUTION (CAR)/ORGANIZATIONAL INNOVATION & DEPLOYMENT (OID)
PLANNED ACTIVITIES CHECKLIST

CAR/OID ACTIVITY TITLE | ORIGINATOR | INITIATION DATE

SIX CATEGORIES OF CAR ARTIFACTS

1. Record of defects or other problems analyzed, and the rationale for decision and/or collect & analyze improvement proposals
2. Performing CAR and/or OID & develop an Action Proposal
3. Action Proposal
4. Action Items evolving from Action Proposal
5. Cost estimates of analysis & resolution
6. Measures of changes to performance resulting from resolution.


2. CHECKLIST FOR IMPLEMENTATION – STEPS TO PERFORM CAR / OID & DEVELOP ACTION PROPOSAL


3. ACTION PROPOSAL

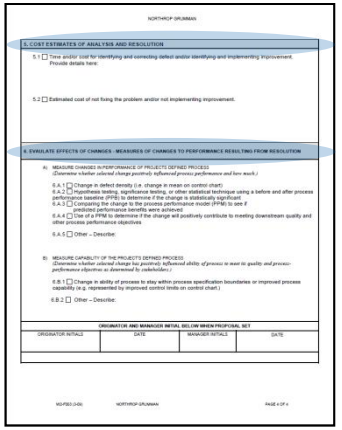
DESCRIPTION OF THE PILOT (Only applicable to OID efforts that require a pilot)

DESCRIPTION OF THE PROBLEM AND/OR IMPROVEMENT PROPOSAL

PHASE OR PROCESS STEP WHEN PROBLEM/DEFECT AND/OR IMPROVEMENT OPPORTUNITY WAS IDENTIFIED

DESCRIPTION OF ACTION PROPOSAL (DOCUMENT CRITERIA FOR EVALUATING SUCCESS OR FAILURE OF CHANGE)

4. CHECKLIST FOR ACTION ITEMS RESULTING FROM ACTION PROPOSAL


5. COST ESTIMATES OF ANALYSIS AND RESOLUTION

6. EVALUATE EFFECTS OF CHANGES - MEASURES OF CHANGES TO PERFORMANCE RESULTING FROM RESOLUTION

ORIGINATOR AND MANAGER INITIAL BELOW WHEN PROPOSAL SET

Identify data to be collected

Develop action plan for innovation

Specify evaluation criteria

Estimate budget & schedule

Measure & evaluate

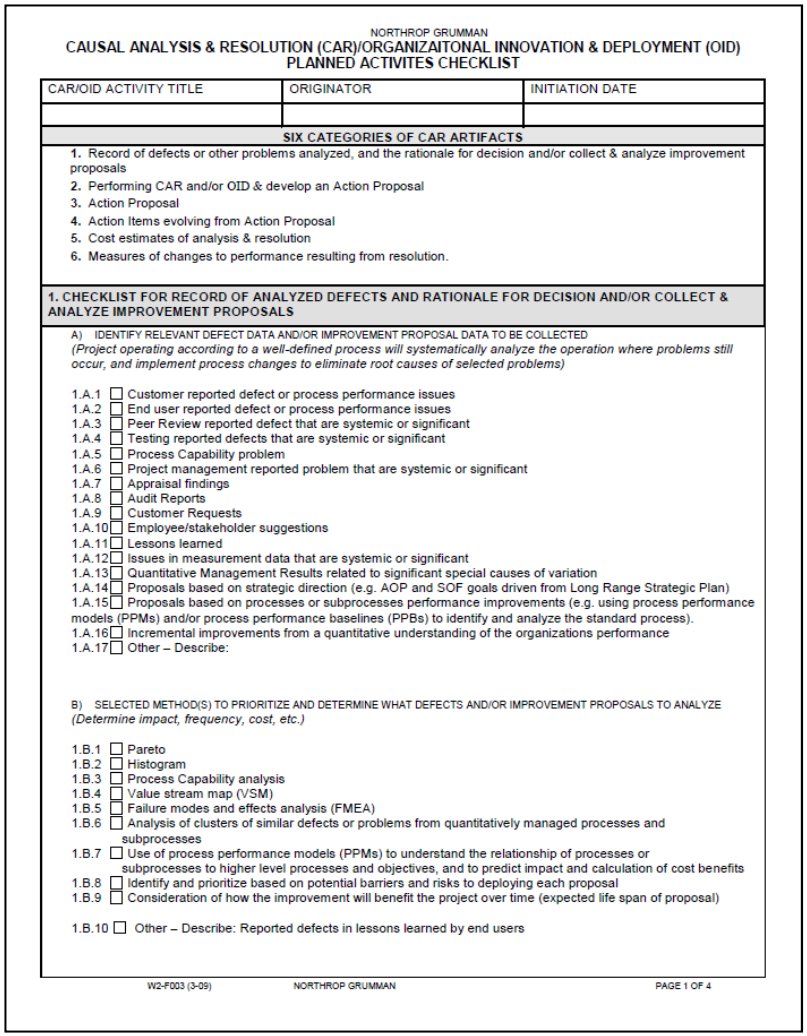
Plan to Execute Successfully

Success Is in the Details- 1

Artifacts generated by following this process

Triggering data or process condition

Business rationale



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CAUSAL ANALYSIS & RESOLUTION (CAR)/ORGANIZAITONAL INNOVATION & DEPLOYMENT (OID) PLANNED ACTIVITES CHECKLIST

CAR/OID ACTIVITY TITLE	ORIGINATOR	INITIATION DATE

SIX CATEGORIES OF CAR ARTIFACTS

1. Record of defects or other problems analyzed, and the rationale for decision and/or collect & analyze improvement proposals
2. Performing CAR and/or OID & develop an Action Proposal
3. Action Proposal
4. Action Items evolving from Action Proposal
5. Cost estimates of analysis & resolution
6. Measures of changes to performance resulting from resolution.

1. CHECKLIST FOR RECORD OF ANALYZED DEFECTS AND RATIONALE FOR DECISION AND/OR COLLECT & ANALYZE IMPROVEMENT PROPOSALS

A) IDENTIFY RELEVANT DEFECT DATA AND/OR IMPROVEMENT PROPOSAL DATA TO BE COLLECTED
(Project operating according to a well-defined process will systematically analyze the operation where problems still occur, and implement process changes to eliminate root causes of selected problems)

1.A.1 ☐ Customer reported defect or process performance issues
1.A.2 ☐ End user reported defect or process performance issues
1.A.3 ☐ Peer Review reported defect that are systemic or significant
1.A.4 ☐ Testing reported defects that are systemic or significant
1.A.5 ☐ Process Capability problem
1.A.6 ☐ Project management reported problem that are systemic or significant
1.A.7 ☐ Appraisal findings
1.A.8 ☐ Audit Reports
1.A.9 ☐ Customer Requests
1.A.10 ☐ Employee/stakeholder suggestions
1.A.11 ☐ Lessons learned
1.A.12 ☐ Issues in measurement data that are systemic or significant
1.A.13 ☐ Quantitative Management Results related to significant special causes of variation
1.A.14 ☐ Proposals based on strategic direction (e.g. AOP and SOF goals driven from Long Range Strategic Plan)
1.A.15 ☐ Proposals based on processes or subprocesses performance improvements (e.g. using process performance models (PPMs) and/or process performance baselines (PPBs) to identify and analyze the standard process).
1.A.16 ☐ Incremental improvements from a quantitative understanding of the organizations performance
1.A.17 ☐ Other – Describe:

B) SELECTED METHOD(S) TO PRIORITIZE AND DETERMINE WHAT DEFECTS AND/OR IMPROVEMENT PROPOSALS TO ANALYZE
(Determine impact, frequency, cost, etc.)

1.B.1 ☐ Pareto
1.B.2 ☐ Histogram
1.B.3 ☐ Process Capability analysis
1.B.4 ☐ Value stream map (VSM)
1.B.5 ☐ Failure modes and effects analysis (FMEA)
1.B.6 ☐ Analysis of clusters of similar defects or problems from quantitatively managed processes and subprocesses
1.B.7 ☐ Use of process performance models (PPMs) to understand the relationship of processes or subprocesses to higher level processes and objectives, and to predict impact and calculation of cost benefits
1.B.8 ☐ Identify and prioritize based on potential barriers and risks to deploying each proposal
1.B.9 ☐ Consideration of how the improvement will benefit the project over time (expected life span of proposal)

1.B.10 ☐ Other – Describe: Reported defects in lessons learned by end users

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Document the Issue, Problem or Opportunity

Success Is in the Details - 2

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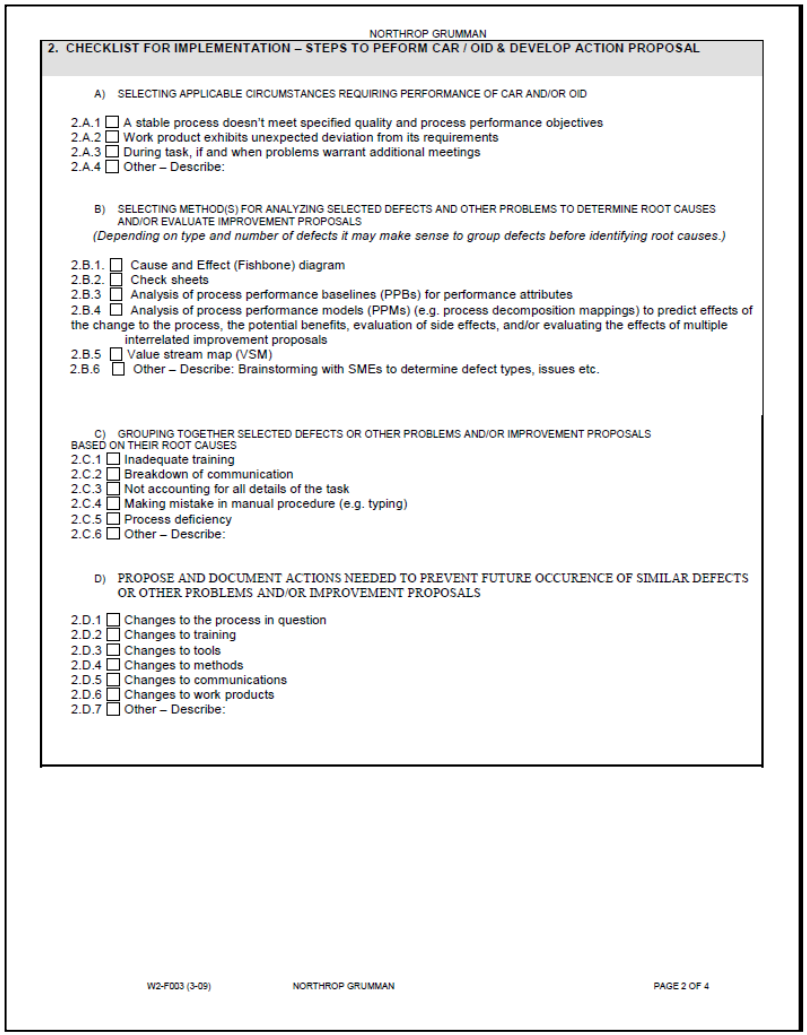
Process performance impacts

Approach for root cause analysis

Root cause

Preventive & corrective actions



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2. CHECKLIST FOR IMPLEMENTATION – STEPS TO PEFORM CAR / OID & DEVELOP ACTION PROPOSAL

A) SELECTING APPLICABLE CIRCUMSTANCES REQUIRING PERFORMANCE OF CAR AND/OR OID

2.A.1 ☐ A stable process doesn't meet specified quality and process performance objectives
2.A.2 ☐ Work product exhibits unexpected deviation from its requirements
2.A.3 ☐ During task, if and when problems warrant additional meetings
2.A.4 ☐ Other – Describe:

B) SELECTING METHOD(S) FOR ANALYZING SELECTED DEFECTS AND OTHER PROBLEMS TO DETERMINE ROOT CAUSES AND/OR EVALUATE IMPROVEMENT PROPOSALS

(Depending on type and number of defects it may make sense to group defects before identifying root causes.)

2.B.1 ☐ Cause and Effect (Fishbone) diagram
2.B.2 ☐ Check sheets
2.B.3 ☐ Analysis of process performance baselines (PPBs) for performance attributes
2.B.4 ☐ Analysis of process performance models (PPMs) (e.g. process decomposition mappings) to predict effects of the change to the process, the potential benefits, evaluation of side effects, and/or evaluating the effects of multiple interrelated improvement proposals
2.B.5 ☐ Value stream map (VSM)
2.B.6 ☐ Other – Describe: Brainstorming with SMEs to determine defect types, issues etc.

C) GROUPING TOGETHER SELECTED DEFECTS OR OTHER PROBLEMS AND/OR IMPROVEMENT PROPOSALS BASED ON THEIR ROOT CAUSES

2.C.1 ☐ Inadequate training
2.C.2 ☐ Breakdown of communication
2.C.3 ☐ Not accounting for all details of the task
2.C.4 ☐ Making mistake in manual procedure (e.g. typing)
2.C.5 ☐ Process deficiency
2.C.6 ☐ Other – Describe:

D) PROPOSE AND DOCUMENT ACTIONS NEEDED TO PREVENT FUTURE OCCURENCE OF SIMILAR DEFECTS OR OTHER PROBLEMS AND/OR IMPROVEMENT PROPOSALS

2.D.1 ☐ Changes to the process in question
2.D.2 ☐ Changes to training
2.D.3 ☐ Changes to tools
2.D.4 ☐ Changes to methods
2.D.5 ☐ Changes to communications
2.D.6 ☐ Changes to work products
2.D.7 ☐ Other – Describe:

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Investigate the Root Cause

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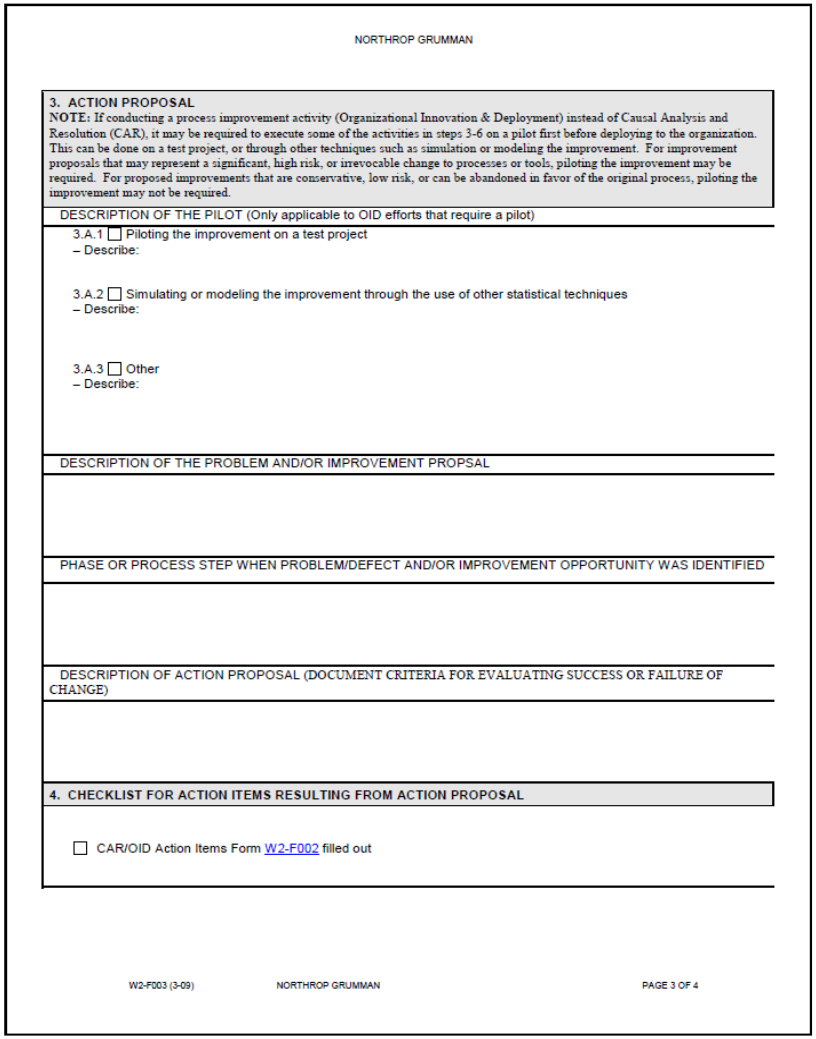
Details of any pilot

Proposal summary

Life cycle impacts

Implementation & evaluation description

Detailed action items



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3. ACTION PROPOSAL

NOTE: If conducting a process improvement activity (Organizational Innovation & Deployment) instead of Causal Analysis and Resolution (CAR), it may be required to execute some of the activities in steps 3-6 on a pilot first before deploying to the organization. This can be done on a test project, or through other techniques such as simulation or modeling the improvement. For improvement proposals that may represent a significant, high risk, or irrevocable change to processes or tools, piloting the improvement may be required. For proposed improvements that are conservative, low risk, or can be abandoned in favor of the original process, piloting the improvement may not be required.

DESCRIPTION OF THE PILOT (Only applicable to OID efforts that require a pilot)

3.A.1 ☐ Piloting the improvement on a test project
– Describe:

3.A.2 ☐ Simulating or modeling the improvement through the use of other statistical techniques
– Describe:

3.A.3 ☐ Other
– Describe:

DESCRIPTION OF THE PROBLEM AND/OR IMPROVEMENT PROPSAL

PHASE OR PROCESS STEP WHEN PROBLEM/DEFECT AND/OR IMPROVEMENT OPPORTUNITY WAS IDENTIFIED

DESCRIPTION OF ACTION PROPOSAL (DOCUMENT CRITERIA FOR EVALUATING SUCCESS OR FAILURE OF CHANGE)

4. CHECKLIST FOR ACTION ITEMS RESULTING FROM ACTION PROPOSAL

☐ CAR/OID Action Items Form W2-F002 filled out

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Develop the Action Plan

Success Is in the Details- 4

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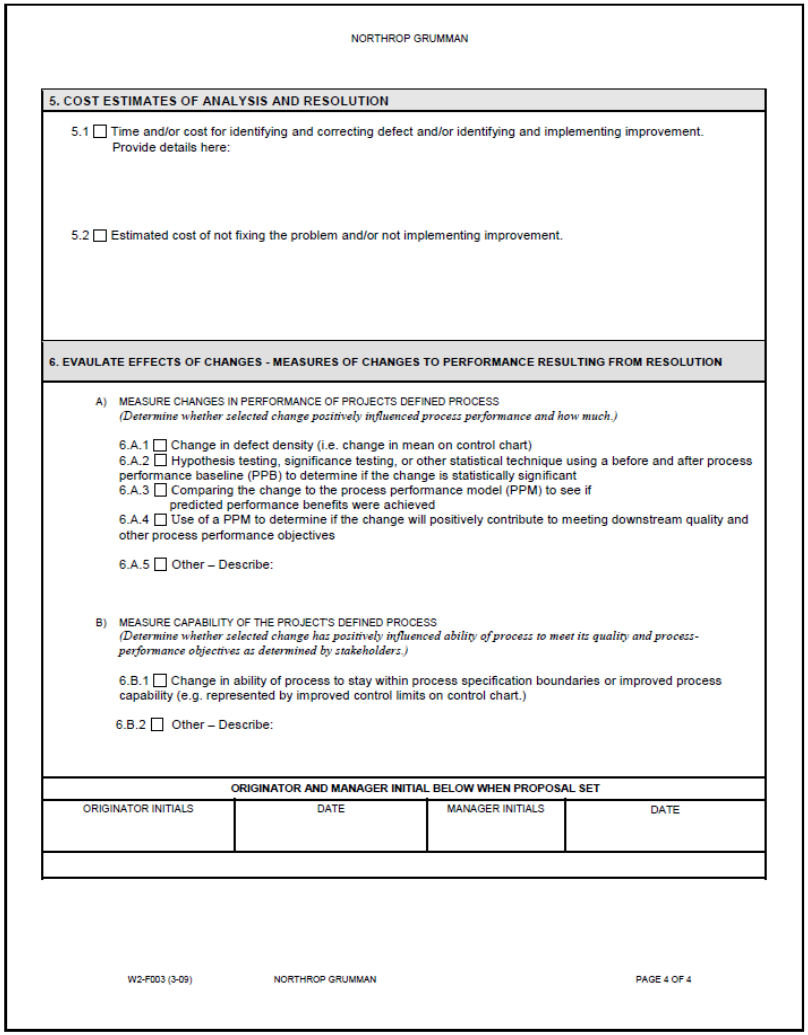
Cost & schedule to implement

Cost if not implemented

Measured performance change

Measured process capability



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5. COST ESTIMATES OF ANALYSIS AND RESOLUTION

5.1 ☐ Time and/or cost for identifying and correcting defect and/or identifying and implementing improvement.
Provide details here:

5.2 ☐ Estimated cost of not fixing the problem and/or not implementing improvement.

6. EVAULATE EFFECTS OF CHANGES - MEASURES OF CHANGES TO PERFORMANCE RESULTING FROM RESOLUTION

A) MEASURE CHANGES IN PERFORMANCE OF PROJECTS DEFINED PROCESS
(Determine whether selected change positively influenced process performance and how much.)

6.A.1 ☐ Change in defect density (i.e. change in mean on control chart)
6.A.2 ☐ Hypothesis testing, significance testing, or other statistical technique using a before and after process performance baseline (PPB) to determine if the change is statistically significant
6.A.3 ☐ Comparing the change to the process performance model (PPM) to see if predicted performance benefits were achieved
6.A.4 ☐ Use of a PPM to determine if the change will positively contribute to meeting downstream quality and other process performance objectives

6.A.5 ☐ Other – Describe:

B) MEASURE CAPABILITY OF THE PROJECT'S DEFINED PROCESS
(Determine whether selected change has positively influenced ability of process to meet its quality and process-performance objectives as determined by stakeholders.)

6.B.1 ☐ Change in ability of process to stay within process specification boundaries or improved process capability (e.g. represented by improved control limits on control chart.)

6.B.2 ☐ Other – Describe:

ORIGINATOR AND MANAGER INITIAL BELOW WHEN PROPOSAL SET

ORIGINATOR INITIALS	DATE	MANAGER INITIALS	DATE

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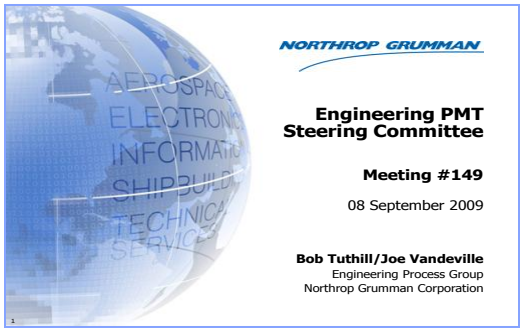
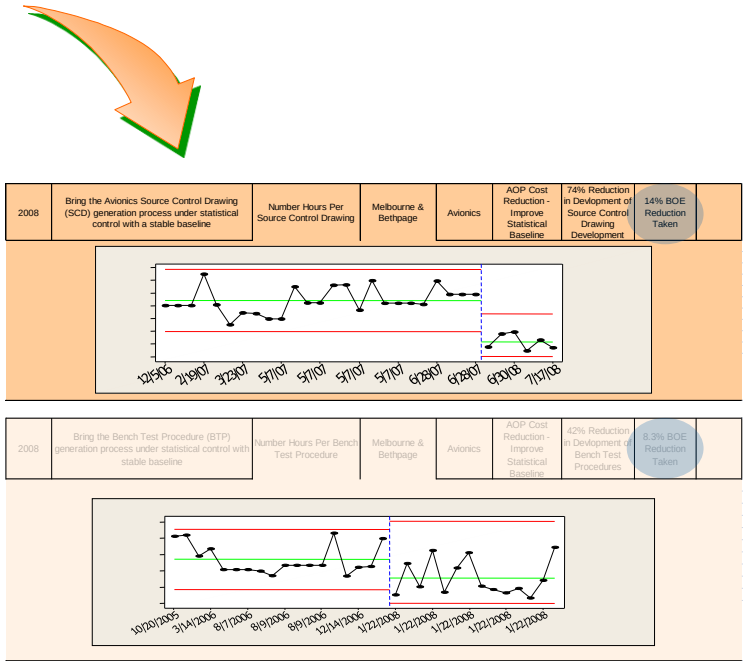
Define the Resources & Document the Results

Market the Results

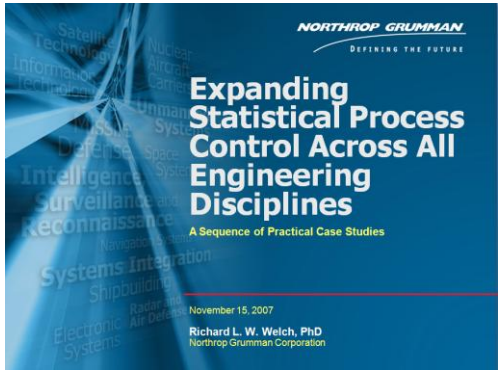


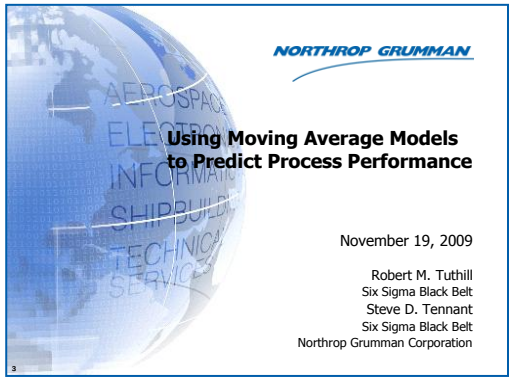


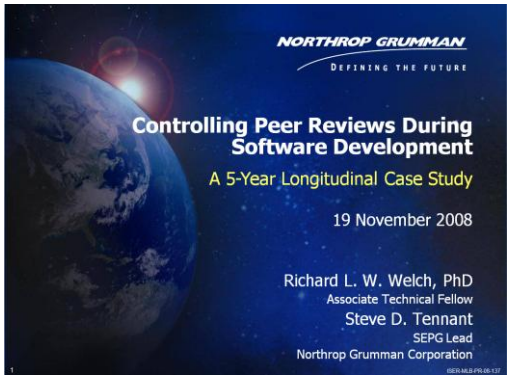
Keep Management Aware of the Value Provided

More Examples from Past CMMI Conferences

- Presentations can be found at the DTIC's NDIA Conference Proceedings web site
  - http://www.dtic.mil/ndia/#s2009







Making It Grow

- Good — Document the new process
- Better — Publish & deliver new training
- Best — Change your engineering rates

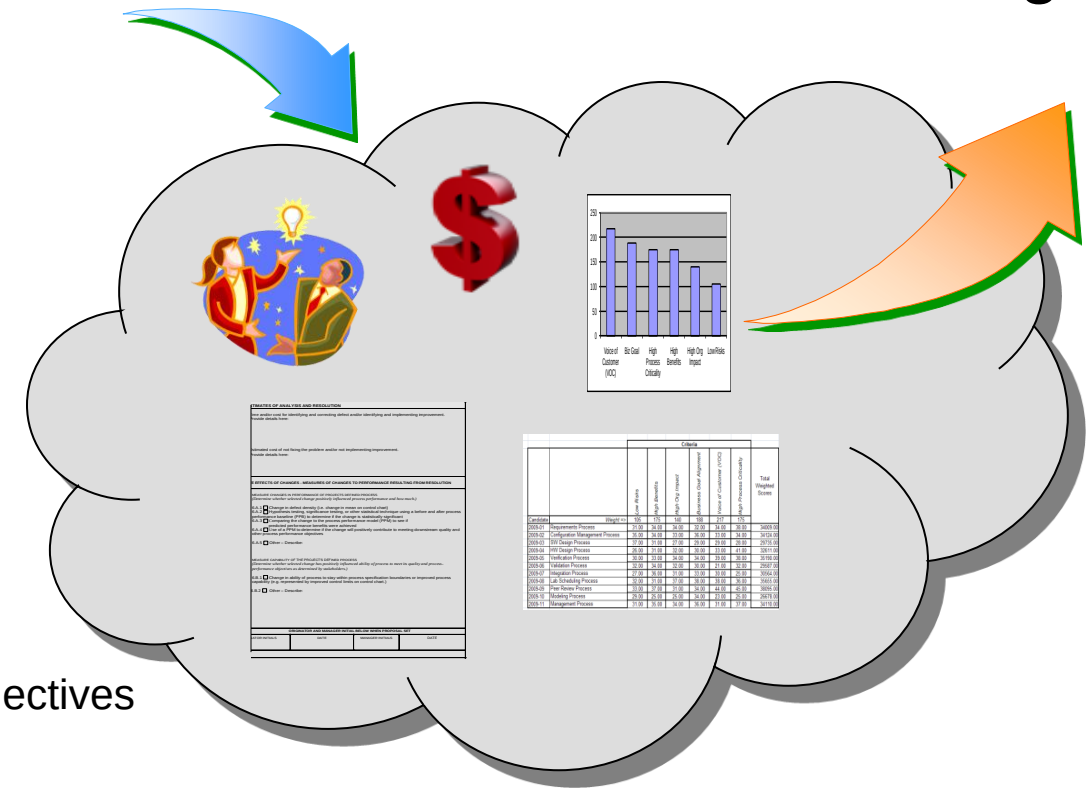
When Managers See Money, Making the Next Business Case Gets Easier

Making the Sale

And you have this . . .

. . . You now can make the business case for High Maturity

Given this . . .



Organizational Goals & Objectives
Competing Resources
Cost Constraints
Competing Improvement Opportunities

Results Sell

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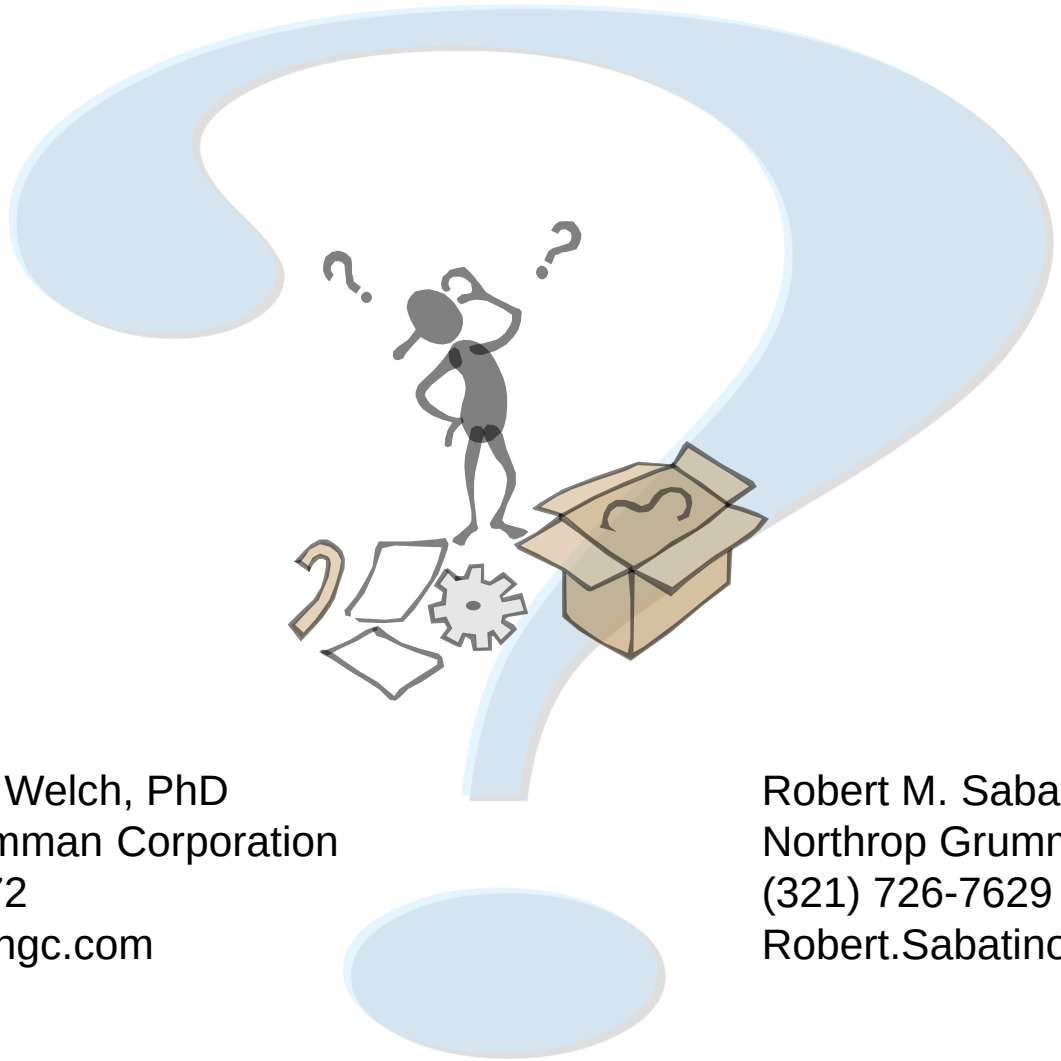
QUESTIONS



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