

NATURAL SPI

Critical Path SCAMPI:
Getting Real Business Results from Appraisals

Critical Path SCAMPISM

**Getting Real Business Results
from Appraisals**



What You Will Get

Level-Set: What Is and What Is Not a SCAMPI	3
Level-Set: What a SCAMPI Can and Cannot Do	5
Problems: What Is Wrong With CMMI Appraisals	8
The Critical Path SCAMPI	9
A CP SCAMPI Success Story	17
Appraisal Quality Through Method Verification	18
How You Can Determine the Future of Appraisals	21
References	22
For More Information	23
Questions	24

What Is a SCAMPI?

A SCAMPI appraisal is (or should be):

- ❑ Based on the appraised organization's business performance and process improvement goals
- ❑ A defined method by which an organization objectively measures its process capability and/or organizational maturity against the CMMI
- ❑ A method for identifying an organization's process strengths and weaknesses
- ❑ A method for identifying an organization's risks to software or systems delivery
- ❑ Based on the evaluation and comparison of evidence with the intent of CMMI goals and practices
- ❑ A predictable and measurable process consistent with the ARC¹, the SCAMPI MDD² and the SCAMPI B & C Handbook³

What Is Not a SCAMPI?

These activities are sometimes called a “SCAMPI,” but they are provably not SCAMPIs:

- ❑ A bunch of “experts” showing up unannounced and asking questions about your processes and then passing judgment on your organization
- ❑ Activities performed without a documented plan
- ❑ Activities that do not yield physical outputs or results
- ❑ The selling of a maturity or process capability level
- ❑ Things called “SCAMPI-like” or “kind of like a SCAMPI”
- ❑ Activities that do not provably comply with the ARC, SCAMPI MDD or the SCAMPI B and SCAMPI C Handbook

What a SCAMPI Can Do

There are 4 things a SCAMPI can do:

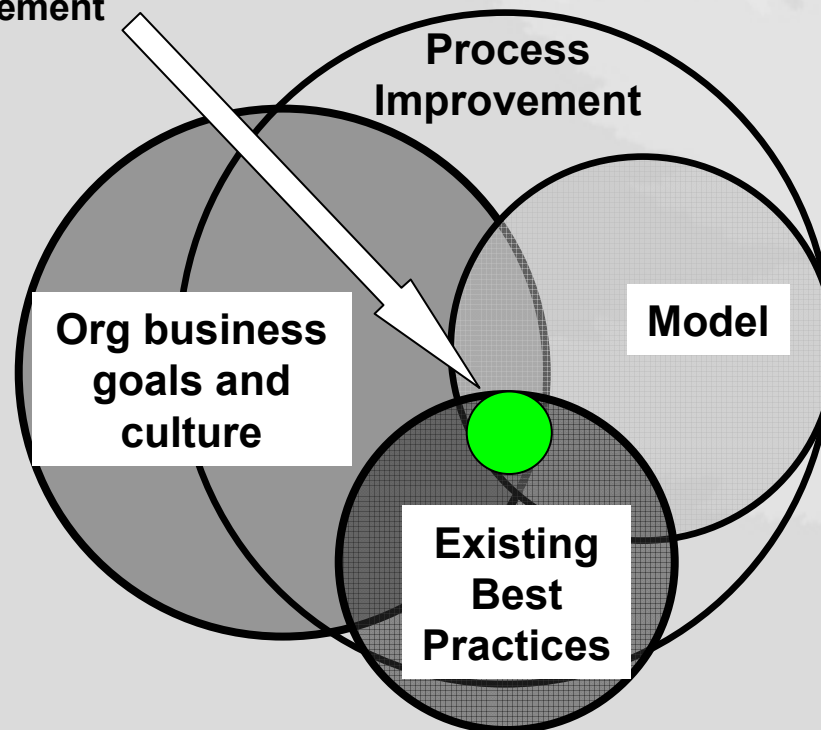
- ❑ Objectively determine the process strengths and weaknesses against the CMMI, so that the organization knows where to focus future improvements, and/or
- ❑ Determine whether the organization has achieved a targeted maturity and/or process capability level, and/or
- ❑ Serve as a catalyst and motivator for the next phase of process improvement
- ❑ Find and quantify risks to systems or service delivery (as in acquisition risks)

Organizations care about maturity or capability levels because:

- ❑ It is perceived to give the organization credibility in software and systems delivery and helps increase their market share, and
- ❑ Gives the organization a benchmark for improving productivity, quality, and predictability.

What A SCAMPI Can Do: Finding the starting point for process improvement

Locus for leveraging
process improvement



Things a SCAMPI Cannot Do: Why Organizations Erroneously Conduct SCAMPIs

A SCAMPI appraisal cannot ...

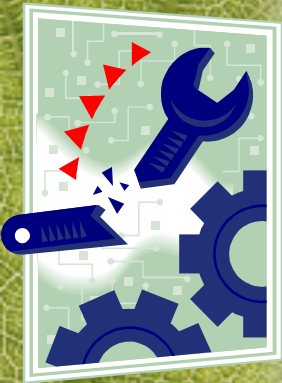
- ❑ Yield information about an organization's future performance in software or systems delivery
- ❑ Indicate anything about the quality, effectiveness, or efficiency of an organization's processes
- ❑ Provide results that are consistent with other SCAMPI appraisals
- ❑ Identify all the risks to an organization's software, systems, or service delivery
- ❑ Indicate anything about customer satisfaction, employee satisfaction, profitability, resource management, market share, innovation ... success

Problem Definition: What is Wrong with CMMI Appraisals?

There are two main reasons why you're not getting what you want from SCAMPIs:

1. The focus is usually on finding CMMI coverage and compliance, not finding risks to software, systems, or service delivery.
2. SCAMPI results are not comparable because no one verifies the appraisal methodologies are followed ... there is no industry quality assurance of appraisals.

Both these factors are causing the systemic, industry-wide problem of maturity and capability level devaluation.



The Critical Path SCAMPI



The Critical Path (CP) SCAMPI is designed and implemented to yield actionable business information while simultaneously minimizing appraisal effort, cost, and schedule.

The CP SCAMPI accomplishes this business result by narrowly defining the scope of the appraisal to target specific appraisal goals and information needs.

The CP SCAMPI provably satisfies the appropriate level of Appraisal Requirements for the CMMI (ARC).

Critical Path SCAMPI Key Attributes

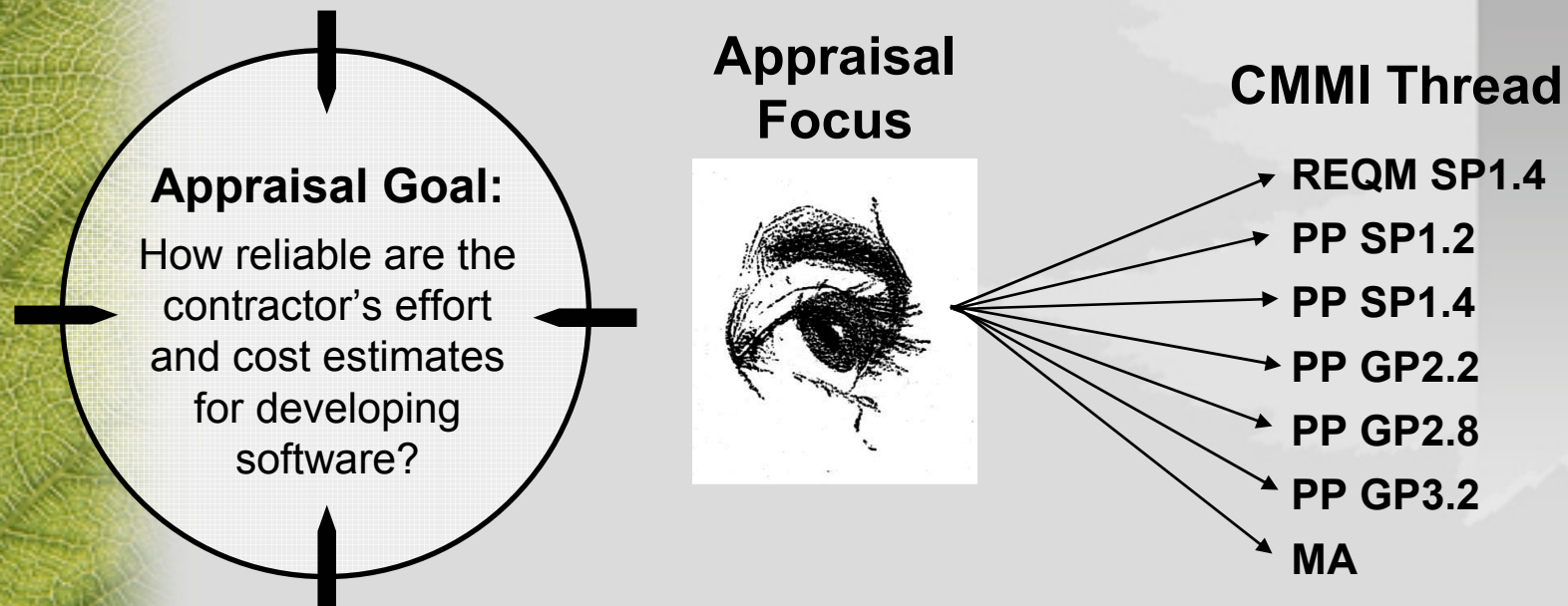
The key attributes and features of the CP SCAMPI are:

- ✓ Appraisal goals define very specific management information needs
- ✓ Appraisal organization and Model scope are narrowly defined
- ✓ Appraisal effort and cost are heavily front-loaded to planning and preparation (up to 50% of total)
- ✓ Traceability between appraisal Model scope and organization documents is defined in advance (no discovery)
- ✓ Target documents are acquired prior to start of appraisal on-site activities
- ✓ Team training exercises use real PIID characterization so that team learning also produces results
- ✓ SCAMPI is planned and managed as a project; progress and performance is measured against plans



The Critical Path SCAMPI Approach

At the core of a CP SCAMPI, appraisal goals and targeted results are tightly linked to “threads” in the CMMI. For example:



Defining Appraisal Goals

The most critical component of a successful CP SCAMPI is defining the appraisal goals and information needs. Be very clear about the targeted results and what will be done with that information.

Typical SCAMPI Goals

- ❑ Determine capability level
- ❑ Determine maturity level

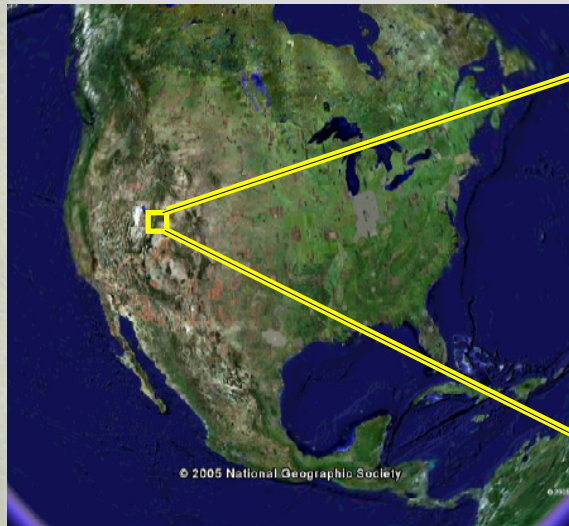
CP SCAMPI Goals

- ❑ How accurate are the organization's estimates and plans?
- ❑ Determine risks introduced in project planning
- ❑ Determine ability to manage project and technical risks
- ❑ How compatible are the subcontractor's processes with ours?
- ❑ What are the organization's standard deviations in SPI, CPI, and EV?

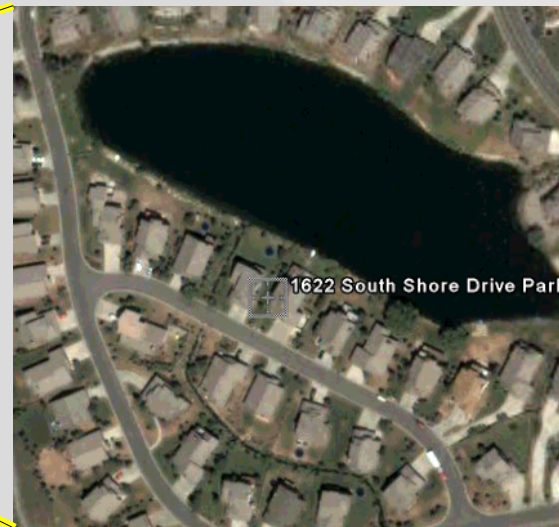
Narrowly Focused SCAMPI Model Scope

The Model scope for a SCAMPI should be driven by the appraisal goals and information needs. CP SCAMPIs drill down deep but not wide using **deductive and inductive reasoning** to define a CMMI thread to be pursued by the appraisal team.

Typical SCAMPI CMMI Scope

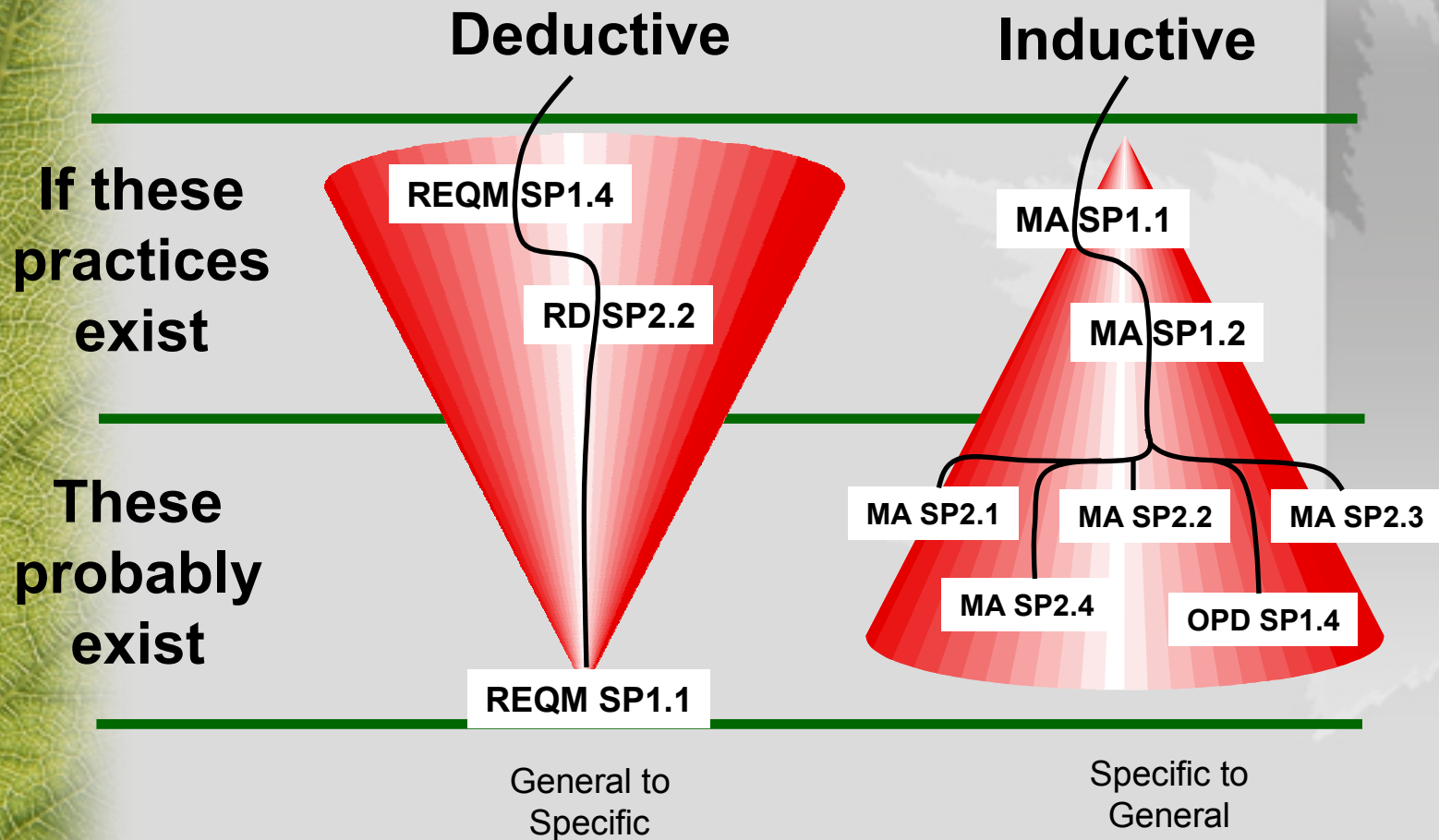


CP SCAMPI CMMI Scope





Pursuing CMMI Threads Through Logic



Pursuing CMMI Threads Through Logic

Sample Deductive CMMI Thread: Risk planning

Appraisal Team
drills down on:

RSKM SP 1.1

Determine risk
sources and
categories

And then deduces:

RSKM SP 2.1

Identify risks

PP SP 2.2

Identify project risks

Deductive Reasoning: A project can identify risks without having historical risks sources and categories. But the only reason an organization would go through the trouble of compiling and organizing risk sources and categories would be to serve as a source for project risk identification and analysis.

Pursuing CMMI Threads Through Logic

Sample Inductive CMMI Thread: Requirements validation

Appraisal Team
drills down on:

RD SP 3.5 Validate requirements with comprehensive methods

And then induces:

REQM SP 1.4 Maintain bi-directional traceability of requirements

RD SP 2.3 Identify interface requirements

RD SP 3.1 Establish operational concepts and scenarios

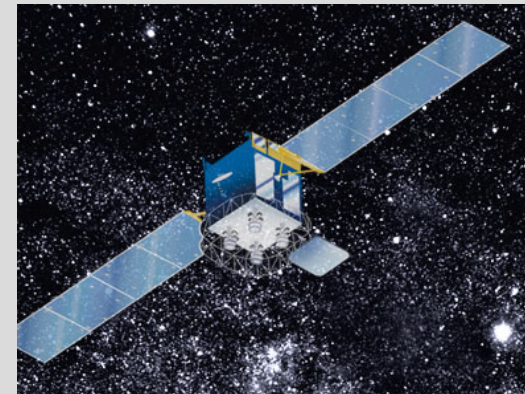
RD SP 3.2 Establish a definition of required functionality

Inductive Reasoning: It is reasonable to induce that if a program/project is able to comprehensively validate requirements, then it has also defined the requirements' functionality (RD SP3.2-1), developed operational concepts/scenarios, use cases, prototypes (RD SP3.1-1), identified the interface requirements (RD SP2.3-1), and that the requirements have been analyzed using some or most of these derivative work products.

Success!

A CP SCAMPI Success Story

Major space acquisition program office needed to know how reliable were the contractors' software effort, cost, and schedule estimates.



Performed CP SCAMPI that:

- ❑ Pursued goal-based focus to drill down on PP SP1.2 and measures (MA for PP)
- ❑ Through deduction, determined that software effort and cost estimates (PP SP1.4) were very accurate and reliable
- ❑ Also determined that budget and schedule estimates (PP SP2.1) were also accurate
- ❑ Gave Program Management assurance and confidence in contractor's software estimates

But What About Problem 2 ...

OK, CP SCAMPI might answer the problem with SCAMPI's focused on the wrong things, but what about quality assurance for SCAMPI appraisal?

ARC Traceability Question



Appendix D, ARC/MDD Traceability Table in the SCAMPI Method Definition Document (MDD) traces SCAMPI MDD processes and activities to ARC requirements.

But how do you know the SCAMPIs you're paying for are conducted in accordance with the SCAMPI MDD or SCAMP B and C Handbook?

ARC Traceability Answer

Verify that in the performance of a SCAMPI, there are activities and/or work products that trace back to the ARC, SCAMPI MDD, or SCAMPI B and C Handbook.

Appraisal Requirements for CMMI: Data Consolidation and Validation

Requirement ID	Requirement Description	Lowest Class	Requirement Traceability / Satisfaction	Requirement Satisfied?
4.5	Data Consolidation and Validation			
4.5.1	The method shall require appraisal team consensus in decisions when determining the validity of observations, creating findings, and establishing ratings.	B	Consensus was covered during training. All practice and goal ratings were completed by consensus	Yes
4.5.2	The method shall require a mechanism for consolidating the data collected during an appraisal into accurate observations according to the following criteria:			
4.5.2.a	Observations shall be objective evidence seen or heard during data collection.			
4.5.2.b	Observations shall be stated without attribution, and expressed in terms of the organizational unit.			
4.5.2.c	The observation is relevant to the appraisal reference model and can be associated with a specific model component.	C	Controlled by mapping to a specific SP, GP in the PIID mapping tool	Yes
4.5.3	The method shall require a mechanism for validating each accurate observation according to the following criteria:			
4.5.3.a	The observation is corroborated.	B	Required at least 2 sources (at least 1 direct and 1 indirect evidence) for each mapping for each project - documented in	Yes

ARC Requirement

SCAMPI Activity or Work Product

How You Can Determine the Future of CMMI Appraisals

Many of you are acquirers or suppliers of SCAMPIs and CMMI appraisals. You don't have to be victims of an unregulated industry.

Things you can do to increase the value of CMMI appraisals and their results:

1. As acquirers, change your RFIs/RFPs to request historical project, process, and product performance measures, not just capability or maturity levels.
2. Make sure the goals for your appraisal specifically define what you really want for results.
3. Ask your lead appraiser to prove – not just claim – that what you're paying for is a SCAMPI or ARC-compliant appraisal.

References

1. Appraisal Requirements for CMMISM (ARC), V1.1; CMU/SEI-2001-TR-34. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University, 2001.
2. Standard CMMI Appraisal Method for Process Improvement (SCAMPISM), V1.1: Method Definition Document (MDD); CMU/SEI-2001-TR-34. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University, 2001.
3. Standard CMMI Appraisal Method for Process Improvement (SCAMPI): Handbook for Conducting SCAMPI B and SCAMPI C Appraisals; CMU/SEI-2001-TR-34. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University, 2004.
4. Natural SPI SCAMPISM Overview, Copyright 2004-2005 Natural SPI Inc.

For more information ...

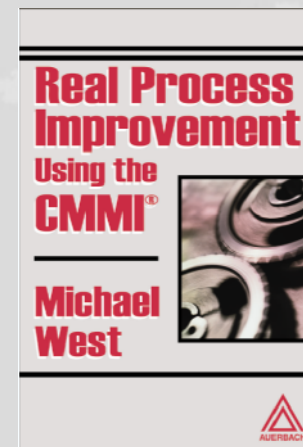
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Questions?

