

SCAMPI 1.3 CHANGES

By Neil Potter and Mary Sakry

Introduction

In March 2011 the SEI released a new version of the SCAMPI¹ appraisal method. In this article we discuss the major changes. The article covers:

- Terminology Changes
- Scoping and Sampling
- Data Coverage Rules
- Managed Discovery
- Appraisal Team Training
- Conflicts of Interest
- Appraisal Team Qualifications
- Appraisals including Multiple Models
- Dates to Watch Out For

Terminology Changes

From the Method Definition Document (MDD), the following changes are described:

Artifacts

- The distinction between direct and indirect artifacts has been removed. This distinction was often confusing and could unnecessarily drive data collection costs higher. The more general term *artifact* is used now.
- *Artifacts* - a tangible form of objective evidence indicative of work being performed that represents either the primary output of a model practice or a consequence of implementing a model practice. These artifacts may include organizational policies, meeting minutes, review results, or other implementation-level work products.
- *Affirmations* - an oral or written statement confirming or supporting implementation (or lack of implementation) of a model practice provided by the implementers of the practice, provided via an



interactive forum in which the appraisal team has control over the interaction. These statements are typically collected using interviews, demonstrations, questionnaires, or other means.

Focus and non-focus projects:

- The terms ‘focus project’ and ‘non-focus project’ were removed in V1.3 to better reflect the new sampling approach and to avoid confusion that has occasionally occurred with these terms in prior method versions. The same concept is reflected in V1.3 data sampling and coverage rules (see later).”

Appraisal input:

- The Appraisal Input document has been removed. Content previously required by the appraisal input is reflected in the initial appraisal plan.

Determine Data Collection Strategy (activity 1.1.2)

This is a new activity added to the method. The data collection strategy outlines the overall high-level scheme for data collection making it more explicit than before.

This includes:

- “The choice of data collection approach (discovery, managed discovery, and/or verification).
- When the data will be collected (e.g., preparation

phase or conduct phase).

- What data collection techniques (e.g., demonstrations, presentations, interviews and questionnaires) will be employed for both objective evidence types (artifacts and affirmations).
- How and when all evidence types will be collected (artifacts and affirmations).
- The organization responsible for collecting the data.”



Scoping and Sampling

This is the biggest change in the SCAMPI method and will probably cause the most problems. The intent is to improve the previous sampling algorithm, which referred to *Focus* and *Non-focus* projects. Organizations sometimes abused this by selecting the best three projects from an organization (regardless of its size) and stating that these were a representative sample.

The new sampling rules define a specific set of criteria that must be considered to define the sample. The result is intended to be a better sample, more consistent among appraisals and transparent (or auditable). Only time will tell if this is indeed the case.

The MDD states:

- “An organization is made up of **basic units**. These identify blocks of work, or people, who form the elements of the organizational unit to be sampled. Examples of basic units include projects, work groups, and teams.
- The concept of a **support function** has also been introduced to explicitly account for other structures within the organizational unit that do not tend to do *customer-facing* work. Examples of support functions include Quality Assurance or Process Engineering groups.
- **Sampling factors** serve to identify meaningful differences in the conditions under which work is performed in the organizational unit. The following candidate sampling factors must be evaluated to determine the organizational scope of the appraisal:
 - *Location*: if work is performed differently in different locations (e.g., countries, cities, sites or installations).
 - *Customer*: if work is performed differently depending on the customer served by that work.
 - *Size*: if work is performed differently based on the size of the basic unit or support function.

- *Organizational Structure*: if work is performed differently in different parts of the organizational structure (e.g., different divisions as depicted on an organization chart).
- *Type of Work*: if work is performed differently based on the *type of work* (e.g., system integration, software development, IT-support services, or help-desk).”

Other example sampling factors considered could include funding source, duration and complexity.

- **Subgroups**, derived from the sampling factors, are a collection of basic units that perform work in a similar way.
- A representative sample for the **organizational unit** (the name of the group that can claim the appraisal result) is established by selecting basic units from each of the subgroups according to the formula at the top of page 3.

To explain the new selection calculation, we describe an example below.

Example

- Company X has 6 projects in total, split between 2 sites (Dallas and Austin).
- The projects are either software development or system integration.
- The relevant sampling factors are determined to be *location* and *type of work*.
- The total number of *possible* subgroups (see Table 1) is therefore 4 (i.e., System Integration Austin, System Integration Dallas, Software Development Austin and Software Development Dallas). Note that the actual number of subgroups is 3 since there is no Software Development work in Dallas.

The number of basic units (i.e., projects) in the organization is 6. The number of basic units that must be sampled is proportional to how many basic units there are in a subgroup. More than the minimum can be sampled,

Minimum number of basic units to be selected from a given subgroup	=	$\frac{\text{Number of subgroups} \times \text{Number of basic units in the given subgroup}}{\text{Total number of basic units}}$
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Formula for Determining Sample Size

but the equation defines the minimum. Table 2 shows the results of the calculation. In this case, 4 projects have to be selected from the 6 available (see “Basic Units Sampled” column). The SCAMPI rule states that the result is rounded to 1 if it is less than 1. Otherwise normal rounding rules apply.

If the organization decides that it does not want to sample from a specific location, and *location* is a critical factor, then that location is removed from the declared Organizational Unit being appraised. For example, in an appraisal, if Austin is not sampled, then Austin cannot claim to be part of the appraisal result. The reason might be that including location might make the appraisal too costly, or including the location might cause a lower rating.

	System Integration	Software Development
Austin	1 basic unit	2 basic units
Dallas	3 basic units	0 basic units

Table 1

The risk of this new sampling method is that differences between basic units, and the process maturity of the subgroups, may be overlooked. For example, if the discussion between the Lead Appraiser and sponsor starts with, “The India and Denmark locations are identical and follow the same processes, so let’s call them the “international” subgroup.” But suppose that India is performing at Maturity Level (ML) 3 and Denmark is ML1. If both are grouped as “international,” and the sample is only taken from India, then Denmark will also be credited with being ML3. The visibility into exactly how each location performs is lost.

Data Coverage Rules

Once the basic units have been selected, the SCAMPI method has the appraisal team create a data collection plan based on new data coverage rules. The rules are stated below, and they are not easy to follow without practice.

	Basic Units at Each Location	Basic Units Sampled
Austin System Integration	1	1 (i.e., 3 subgroups x 1 basic unit / 6 total basic units = 0.5)
Austin Software Development	2	1 (i.e., 3 x 2 / 6 = 1.0)
Dallas System Integration	3	2 (i.e., 3 x 3 / 6 = 1.5)

Table 2

Following on with the example, the process areas that these groups perform are listed in the

columns in Table 3. The coverage rules are used to determine what data to collect. Below we explain the rules (taken from MDD) and how they are applied.

- **Coverage rule 1:** For each subgroup, both artifacts and affirmations shall be provided for at least one basic unit for every process area implemented by basic units within that subgroup. This sampled basic unit shall provide data for all process areas.

Our explanation: There are three subgroups, so at least one line per subgroup in the table samples both artifacts (Art) and Affirmations (Aff) from one sampled basic unit. “X” represents a sample; “O” represents no sample taken.

- **Coverage rule 2:** For at least 50 percent of the sampled basic units in each subgroup, both artifacts and affirmations shall be provided for at least one process area implemented by basic units within that subgroup.

Our explanation: In the second subgroup there are two basic units: “Austin Software Development 1,” and “Austin Software Development 2.” Only one has to be sampled (see Table 2). Coverage rule 2 is therefore covered from applying rule 1 since rule 1 has already selected a basic unit to sample.

In the third subgroup there are 3 basic units. However, only 2 are required to be sampled (see Table 2) and 50% is 1 basic unit. This means

that Dallas System Integration 2 is providing an adequate amount of data.

- **Coverage rule 3:** For all sampled basic units in each subgroup, either artifacts or affirmations shall be provided for at least one process area implemented by basic units within that subgroup.

Our explanation: In the third subgroup (the last three lines of the table), there are three basic units. The selection calculation (Table 2) determined that only 2 of these needed sampling. So one PA (PMC) is selected from “Dallas System Integration 3” to seek affirmations. The other basic units in the subgroup, another PA, or artifacts could have been selected.

There are also three similar coverage rules for support functions, such as Quality Assurance, Configuration management, and the Software Engineering Process Group. These can be found in the MDD.

The selection and data coverage rules do make the Lead Appraiser and sponsor more conscious of how they sample the organization. But they also help organizations hide low performing teams, and allow organizations to provide “some data on some PA,” to complete the table. If a Lead Appraiser believes that “Division A and division B are just alike,” and they are merged into one subgroup, then it is just luck whether the appraisal ratings reflect what is actually going on.

Business Unit by Subgroup	REQM		PP		PMC		RD		TS		PI		VER		VAL		IPM		Rule
	Art	Aff	Art	Aff	Art	Aff	Art	Aff	Art	Aff	Art	Aff	Art	Aff	Art	Aff	Art	Aff	
Austin System Integration 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	1+2+3
Austin Software Development 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	1+2+3
Austin Software Development 2	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
Dallas System Integration 1	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
Dallas System Integration 2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	1+2
Dallas System Integration 3	o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	o	3

Table 3 – All basic units listed, with sampled ones shown with “x”

A short webinar on this topic by SEI is available (see link at bottom of page). Note that it was recorded in May 2010, and a few of the terms have changed.

Managed Discovery

SCAMPI 1.2 appraisals had two modes, *Verification* and *Discovery*. That is, you could either go into the appraisal having identified the majority of evidence and *verify* it, or you could have little idea of what the organization was doing and *discover* it as you go.

In SCAMPI 1.3, *Managed Discovery* represents a third data collection approach where appraisals provide an interactive build-up of the organization's objective evidence database. This approach describes what usually happens in most appraisals anyway, and so it is not a big change.

Appraisal Team Training

There is no upgrade class to take for appraisal team members. The method expects the lead appraiser to train the team members in the SCAMPI process based on their current familiarity with the process, with at least one meeting to coordinate the team.

Conflicts of Interest

There is a new section on identifying conflicts of interest among team members (activity 1.3.3). This is pretty much common sense but makes the discussion with the sponsor more explicit. The intent is to have people avoid evaluating their own work in the appraisal. Conflicts are assessed, discussed with the sponsor, and mitigated in the risk management plan.

Suggested mitigation actions from MDD include: adding people external to the organization being appraised, matching experienced and non-experienced team members in mini-teams, having the LA more involved in mini-teams where there could be an issue, and terminating the appraisal after discussion with the sponsor.

Appraisal Team Qualifications

In the previous version of the method, the total number of years' experience factored into the team experience count included the Lead Appraiser. For appraisal team members that were only a few years out of college, the 20+ years' experience of the Lead Appraiser helped make the averages meet SEI rules by themselves.

In SCAMPI 1.3, the Lead Appraiser experience is not counted and therefore the team will have to meet the following rules:

“Team members must have:

- An average of at least 6 years of field experience.
- At least 2 years of experience performing the type of work addressed in each appraisal reference model included.
- An aggregate of 25 years of field experience relating to the content of each of the reference models in the scope of the appraisal.

The team (as a group):

- Must have a total of at least 10 years of management experience, and at least one team member must have at least 6 years of experience as a manager.
- Shall not be comprised entirely of staff that wrote the processes being appraised.
- Shall not include the sponsor of the appraisal.
- Shall not include a senior manager who has supervisory authority over the entire organizational unit.”

Appraisals including Multiple Models

The new method, and the SEI's appraisal tool SAS, allows for a single appraisal to appraise multiple organizations using multiple models. For example, one appraisal could be scoped to look at two groups, one development group and one services group. There would be one appraisal plan, one team, and one submission of artifacts to SEI. This is discussed in Appendix F of the MDD.

Dates to Watch Out For

All appraisals must use SCAMPI 1.3 by 4/1/12. Until then, either method can be used.

All appraisals must use CMMI 1.3 by 12/1/11.

The SEI date list is at:

<http://www.sei.cmu.edu/cmmi/tools/cmmiv1-3/schedule.cfm>

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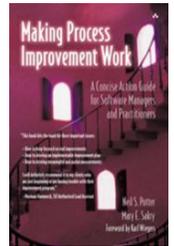
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Two-day workshop, AGILE SOFTWARE DEVELOPMENT (SCRUM).
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Two-day workshop, DOING MORE FOR LESS.
- ❑ **Understand customer needs. Clarify product requirements early.**
Two-day workshop, IN SEARCH OF EXCELLENT REQUIREMENTS.
- ❑ **Manage projects effectively. Meet project deadlines and reduce risks.**
Three-day workshop, PROJECT PLANNING AND MANAGEMENT.
- ❑ **Meet project deadlines. Scope and estimate the project work.**
One-day workshop, PROJECT ESTIMATION.
- ❑ **Avoid schedule delays caused by needless product rework. Find defects rapidly.**
Two-day workshop, INSPECTION (PEER REVIEWS).
- ❑ **Hands-on SEI CMMI. Perform a CMMI gap-analysis.**
The following workshops are available:
 - CMMI-DEV: Overview (1/2 day), LEVEL 2 (1 day), LEVEL 3 (2 days), Intro to CMMI-DEV (3 days).
 - Intro to CMMI-SVC (3 days), Supplement class (1 day), LEVEL 2 (1 day).
- ❑ **Identify critical changes to improve organizational results. Benchmark against the CMMI.**
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Foreword by Karl Wiegers

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References

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