# Lower Cost, More Effective Alternatives to SCAMPIs

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# Background

- **As a set, the SCAMPI methods provide a powerful set of tools to use in CMMI adoption**

- **However, there are some situations in which these three methods are not appropriate, or are not cost-effective**

- **This presentation will discuss the features and limitations of the three methods, and alternatives that should be considered**

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

# Characteristics of CMMI Appraisal Classes

**The ARC (Appraisal Requirements for CMMI) defines appraisal classes**
- A guide to inventors of appraisal methods, and their customers

**Key differentiating attributes for appraisal classes include**
- the degree of confidence in the appraisal outcomes
- the generation of ratings
- appraisal cost and duration

*Appraisal Requirements for CMMI, Version 1.1, CMU/SEI-2001-TR-034*

| Characteristics | Class A | Class B | Class C |
|---|---|---|---|
| Amount of Objective Evidence Gathered (relative) | High | Medium | Low |
| Ratings Generated | Yes | No | No |
| Resource Needs (relative) | High | Medium | Low |
| Team Size (relative) | Large | Medium | Small |
| Appraisal Team Leader Requirements | Lead appraiser | Lead appraiser or person trained and experienced | Person trained and experienced |

**SCAMPI-A**      **SCAMPI-B**      **SCAMPI-C**

*References: "A Quantitative Comparison of SCAMPI A, B, and C," R. Hefner and D. Luttrell, CMMI Technology Conference and User Group, 2005*

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3

# A Variety of Appraisals



**All Appraisals**

**ARC-Compliant Appraisals**

**SCAMPI-C**

**SCAMPI-B**

**SCAMPI-A**

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

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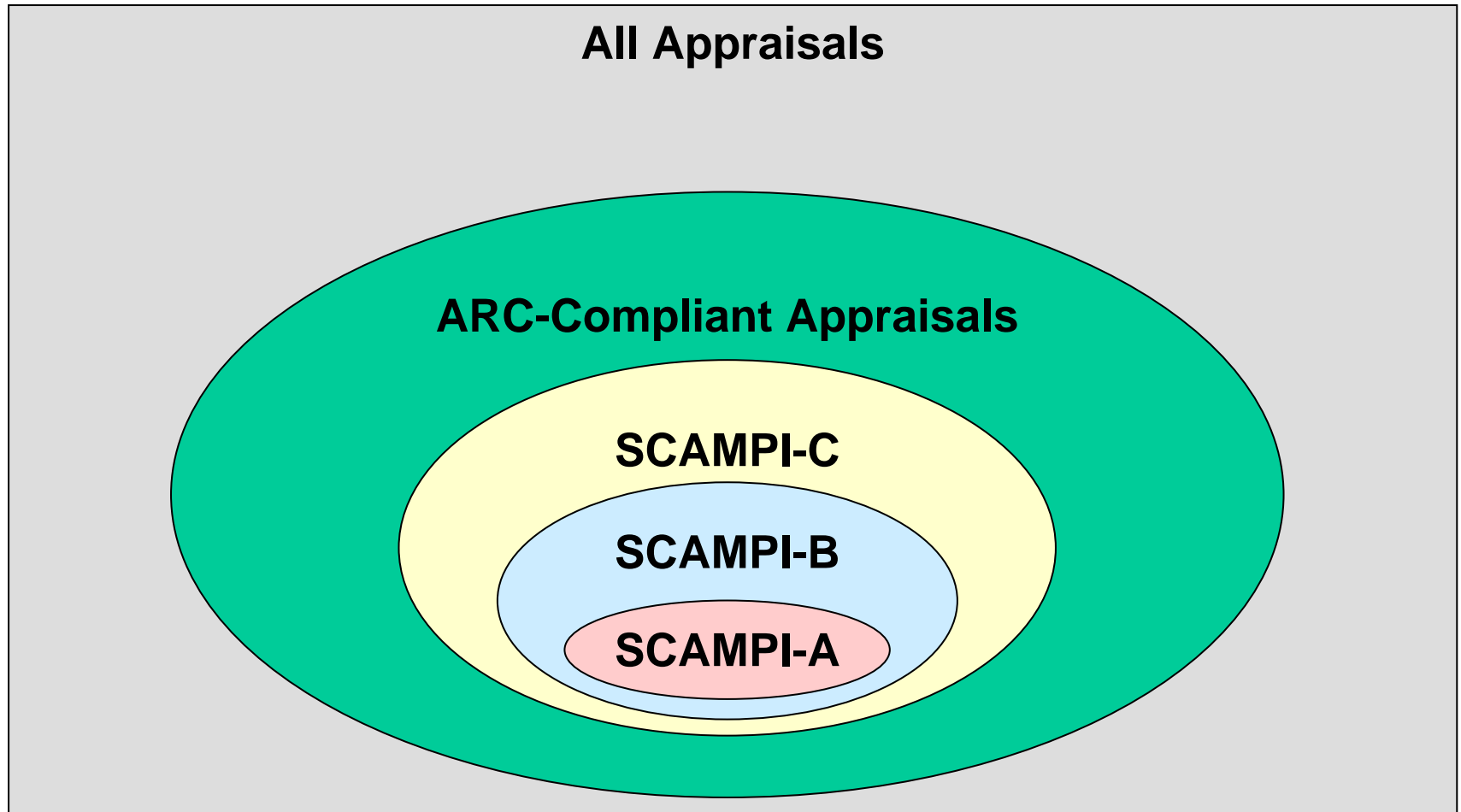
# What's Important About ARC Compliance?

> The appraisal principles for the CMMI Product Suite are similar to those for appraisals using the Capability Maturity Model for Software and Systems Engineering Capability Model:
> - Start with an appraisal reference model.
> - Use a formalized appraisal process.
> - Involve senior management as the appraisal sponsor.
> - Focus the appraisal on the sponsor's business objectives.
> - Observe strict confidentiality and non-attribution of data.
> - Approach the appraisal collaboratively.
> - Focus on follow-on activities and decision-making based upon the appraisal results.
>
> *- ARC, v1.2*

- ***In what situations would these principles not be appropriate?***

  - Sponsor desire for an informal appraisal process

  - Non-attribution not critical

  - Inability/no desire to work collaboratively

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

# What's Important About SCAMPI-A Compliance?

> The Standard CMMI Appraisal Method for Process Improvement (SCAMPI) is designed to provide <span style="color:red">benchmark-quality</span> ratings relative to Capability Maturity Model Integration (CMMI) models.
>
> SCAMPI A enables a sponsor to
> - gain insight into an organization's capability by identifying the strengths and weaknesses of its current processes
> - relate these strengths and weaknesses to the CMMI reference model(s)
> - prioritize improvement plans
> - focus on improvements (correct weaknesses that generate risks) that are most beneficial
> - to the organization given its current level of organizational maturity or process capabilities
> - derive capability level ratings as well as a maturity level rating
> - identify development/acquisition risks relative to capability/maturity determinations
>
> *- SCAMPI A, v1.2*

- **SCAMPI-A appraisals were designed to:**
  - Be accurate (collaboration of multiple sources – direct, indirect, written/face-to-face affirmations, trained team, authorized team leader)
  - Achieve organizational buy-in (collaborative approach, construction of PIIDs, interviews, draft findings)

- ***In what situations would this not be appropriate?***

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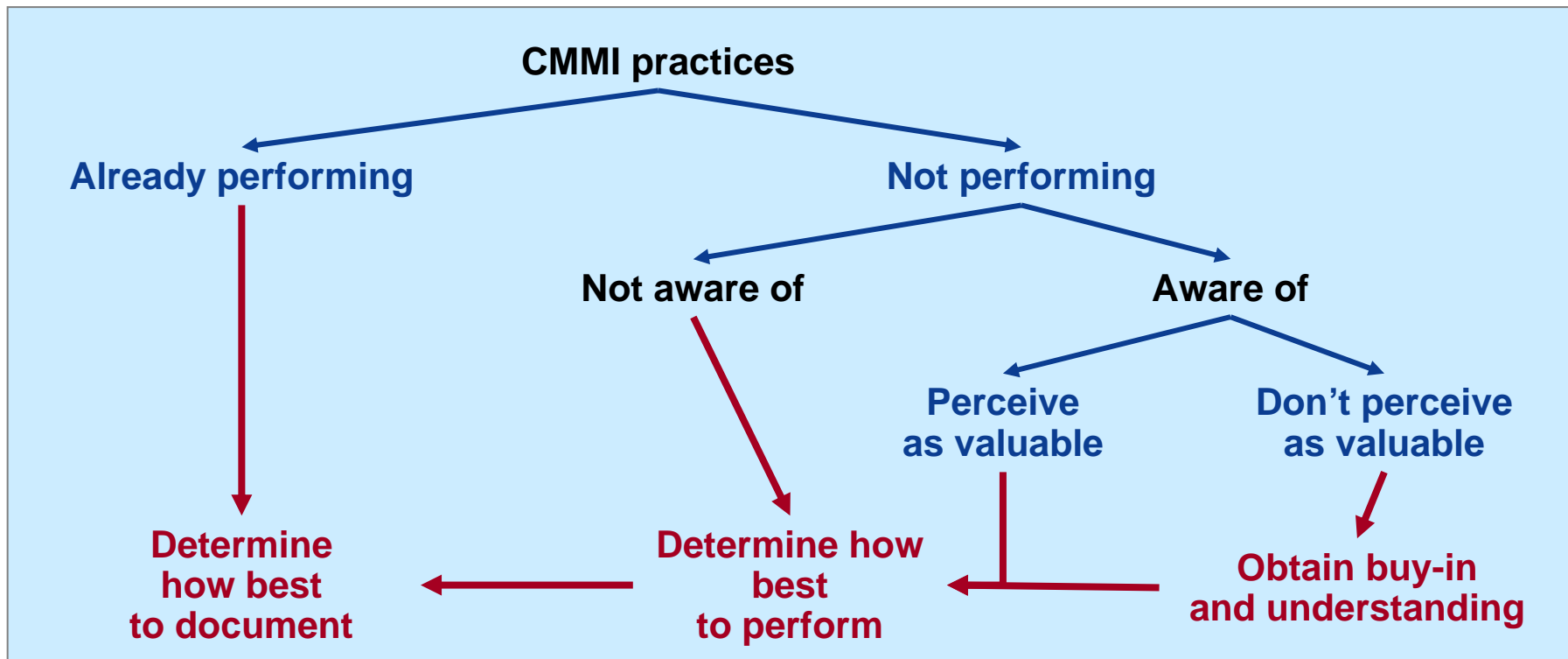*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

6

# How Do SCAMPI-B and -C Relate?

> These methods can form building blocks for a progression of appraisals – for example, starting with a SCAMPI C reviewing the process descriptions, then a SCAMPI B investigating their deployment to projects, finally leading to a formal benchmarking event focused on institutionalization of the practices across the organization.
>
> *-- Handbook for Conducting Standard CMMI Appraisal Method for Process Improvement (SCAMPI) B and C Appraisals, Version 1.1*

- **But all SCAMPI appraisals share the same basic methods (interviews, evidence review, team qualifications) and reflect similar objectives (accuracy, buy-in)**

- **The typical SCAMPI C/B/A sequence works well for an organization starting a process improvement effort, i.e., no defined processes**

- **May not work as well for an organization that has existing processes, and whose main issue is project adoption**
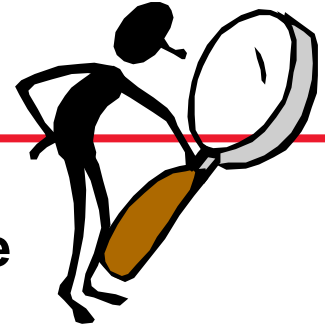
*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

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# Adopting the CMMI



```
                        CMMI practices
                    ↙                    ↘
    Already performing                    Not performing
          │                           ↙              ↘
          │                    Not aware of            Aware of
          │                         │              ↙          ↘
          ↓                         │      Perceive        Don't perceive
    Determine      ←── Determine how │    as valuable      as valuable
    how best              best       │         │                │
    to document        to perform    │         └──→ ←──         ↓
                                     ↓                    Obtain buy-in
                                                        and understanding
```

- **Key enablers**
  - Willingness to learn unfamiliar practices
  - Desire to extract value rather than "check the box"
  - Ability to interpret the CMMI in your context
  - Access to experts

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

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# Effective Use of Audits and Appraisals

- **Process and product audits provide tangible, objective measures of adoption/sustainment**
    - Policies, processes, and standards must reflect the desired behaviors

- **Appraisals evaluate the effectiveness of the audit program**
    - Standardized tools, approaches, and methods
    - Consistency of appraisers – if they understand the way we are structured and operate, there is less time required to understand what we are doing.
    - Pre-appraisal activities to prepare projects for the appraisal process

- **The frequency of audits and appraisals, and the sampling, must reflect the progress of the cultural change**
    - As the culture begins the change, more frequent and more in-depth audits/appraisals are required
    - Later, the amount of audits/appraisal may decrease, _if_ the culture has truly changed

*"Sustaining CMMI Compliance ," R. Hefner, CMMI Technology Conference and User Group, 2006*
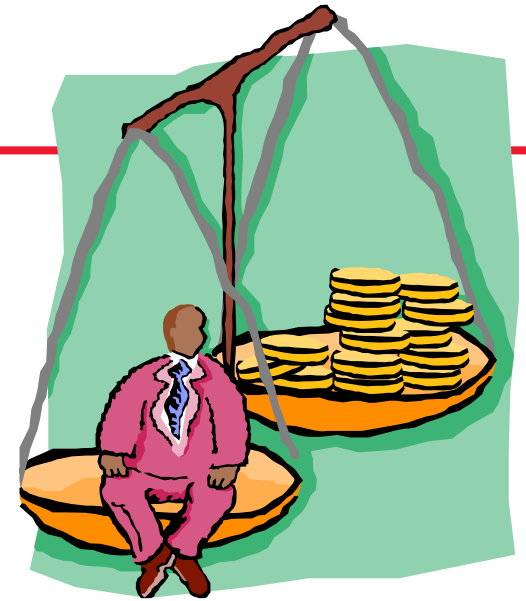
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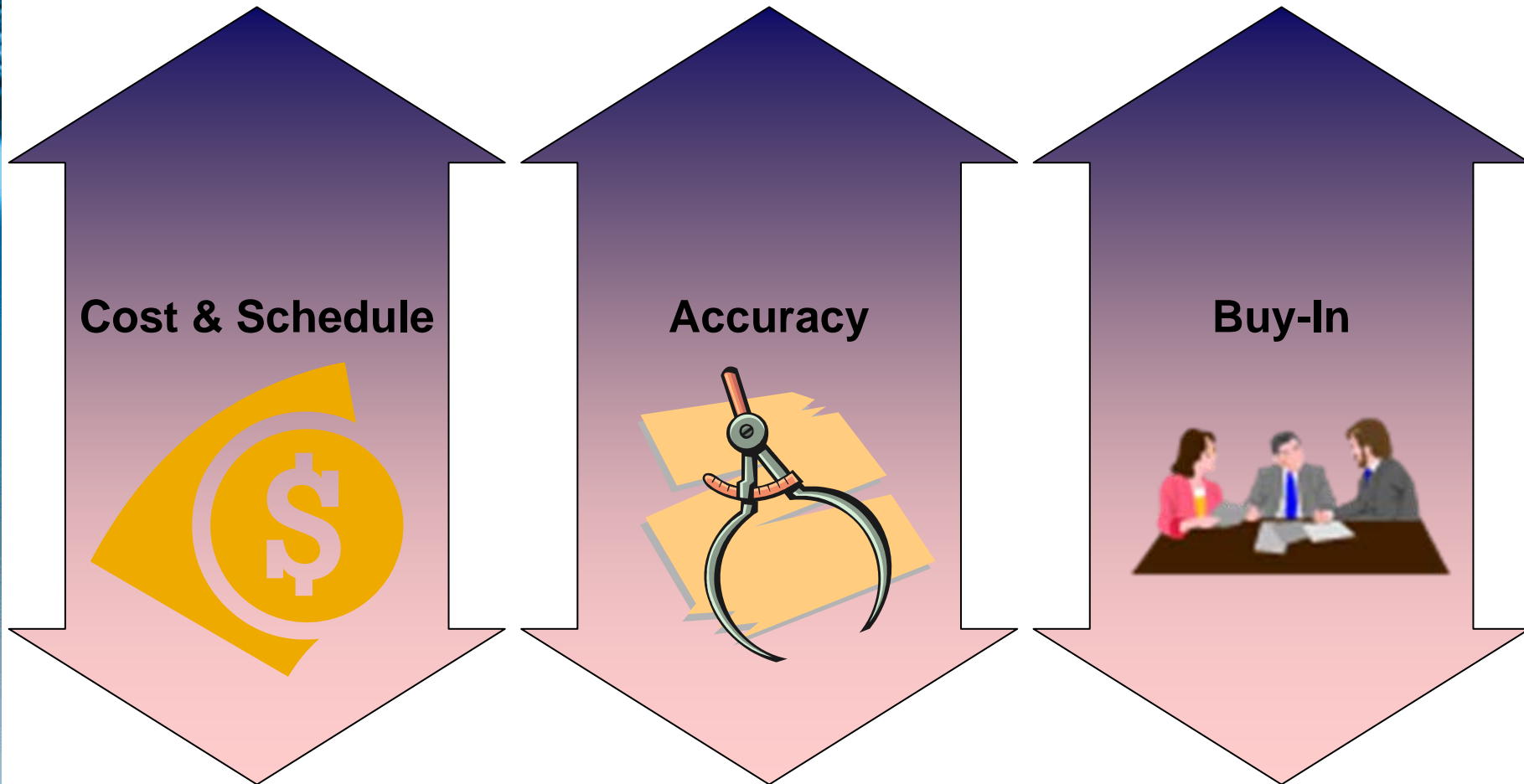*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

# Where Could We Save Money?

- **Could we ignore/relax some of the ARC requirements?**
  - Use an undocumented method
  - Use an untrained team
  - Less preparation of participants
  - Less involvement of participants
  - Less corroboration of evidence

- **Could we use different approaches than SCAMPI uses?**
  - Assist projects in evidence gathering
  - Don't require consensus among appraisers
  - Use a different rating scheme (or no ratings)
  - Use different objectives than practice compliance (efficiency, effectiveness, consistency, understanding/awareness, etc.)

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

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# Impacts



**Cost & Schedule**

**Accuracy**

**Buy-In**

*"A Quantitative Comparison of SCAMPI A, B, and C," R. Hefner and D. Luttrell,
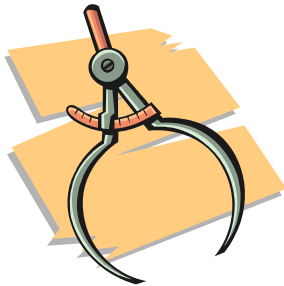CMMI Technology Conference and User Group, 2005*

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

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# Minimum Team Size

- **Cost is composed of:**
  - Team costs – goes up with team members
  - Organizational costs (interview, presentations) – largely fixed regardless of size
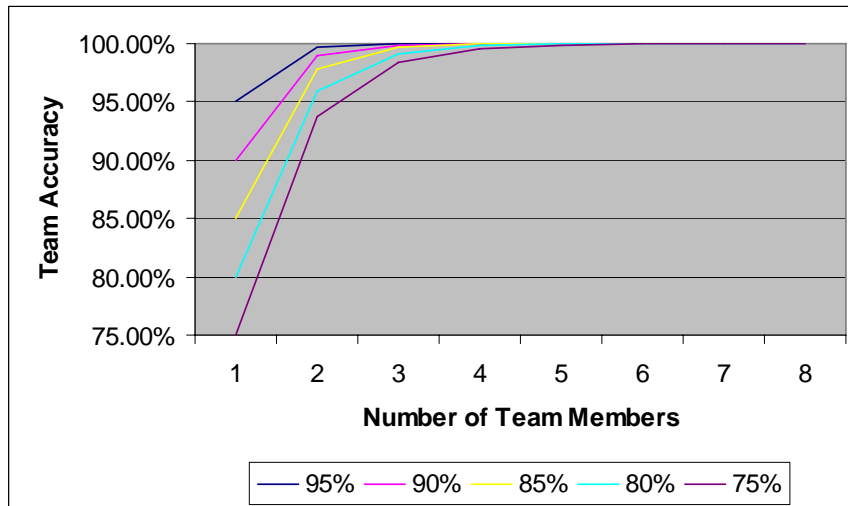
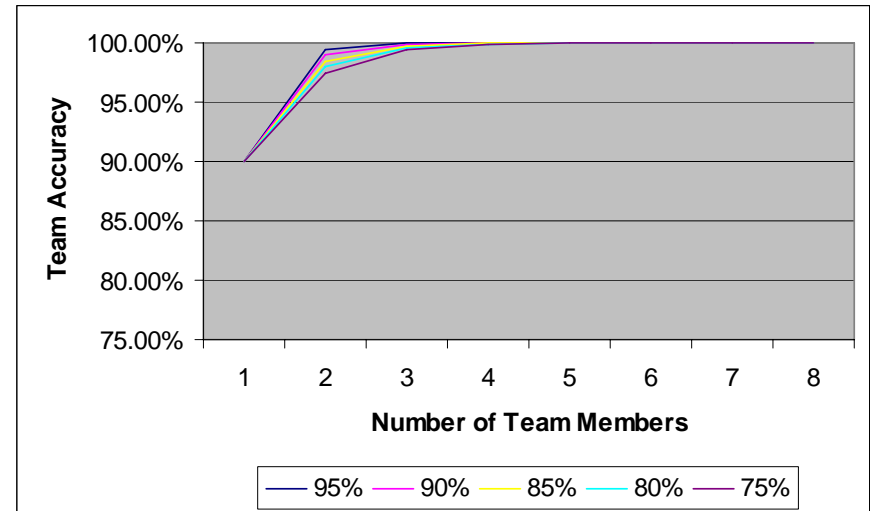- **Accuracy goes up with as team size increases**

- **Buy-in is driven by the confidence the organization's members has in the appraisal process and appraisal team**
  - Larger teams can increase the likelihood that a respected person is on the team

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

# Team Accuracy vs. Team Size

- **Team accuracy vs. team size, for given individual accuracies**

- **Same, assuming 90% leader accuracy**





- **As team size goes up, team accuracy rapidly increases (assuming the right answer is obvious once presented)**

- **Teams of greater than 4 provide little increase in accuracy**

- **If the team leader is 90% accurate, additional team members add little accuracy**

- **Adding team members does give a chance for them to learn**

**Appraiser accuracy, not team size, is critical**

*Hefner, "Lower Cost, More Effective Alternatives to SCAMPIs", 2007*

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# Sources of Objective Evidence

- **Evidence review takes 1-2 times the length of interviews**
    - If evidence is not reviewed, easy to answer "correctly" in the interviews
    - If interviews are not conducted, evidence may be faked (not really in use) - normally easy to spot
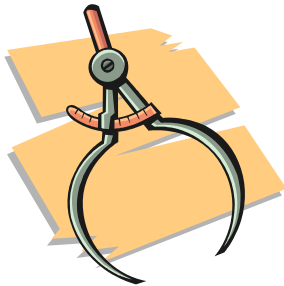
- **Accuracy increases significantly with evidence review**

- **Validation takes little time and often increases accuracy 20-30%**

- **Buy-in is greatly increased by validation**
    - Nothing decreases buy-in faster than a "weakness" that everyone knows is wrong

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# The Workshop Concept

- **Objectives:**
  - Determine current gaps relative to project compliance with CMMI
  - Map existing evidence to CMMI
  - Determine effective ways to perform and/or document practices
  - Raise awareness of project personnel, build buy-in

- **Process:**
  1. Train projects on CMMI terminology and structure (1-3 day)
  2. Projects complete PIIDs mapping of their existing evidence, self-assess practice and evidence gaps
  3. A CMMI expert walks a group of projects through the model. For each practice, the expert:
     - Describes the practice and typical evidence
     - Reviews each project's evidence for acceptability
     - Identifies practice gaps and discusses possible solutions
     - Identifies documentation gaps and possible solutions

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# Summary

- **As a set, the SCAMPI methods provide a powerful set of tools to use in CMMI adoption**

- **However, there are some situations in which these three methods are not appropriate, or are not cost-effective**

- **Improvement professionals should consider the full range of options available to them, and select the tools and methods best suited to the needs of the sponsor**

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