Work Product-based Tracing Between CMM® Models

Steven R. Ligon, Ph.D.
Senior Systems Engineer

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Topics

- The challenge today: Which model will be required for the next contract?
- Trends evident across CMM® models
- Proposed solution: Cross-model tracing based on work products
- Demonstration of prototype tool
- Questions

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Purpose of This Briefing

To illustrate that:

- Work product is the only honest way to link business processes to maturity models
- Archiving our work products-to-model tracings will enable us to maximize flexibility in a market that doesn't really know what model it wants us to use from day to day

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The Challenge Today

- What model should we evaluate against?
- The issues of contract specifications
- “Being there” for the customer, regardless of selected model
- Costs associated with re-tracing organizational products to new models and preparing for appraisals & reviews

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Observations Across Models

	SW-CMM® (Ver 1.1-1993)	SE-CMM® (Ver 1.1-1995)	FAA-iCMM® (Ver 1 - 1997)	CMMI-SE/SW(SM) (Ver 1.1 2001)
Representations	Staged	Continuous	Continuous (With Staged Option)	Staged / Continuous
Capability/ Maturity Levels	1-Initial 2-Repeatable 3-Defined 4-Managed 5-Optimizing	0-Not Performed 1-Informal 2-Planned/ Tracked 3-Well Defined 4-Quant. Control 5-Cont. Improving	1-Informal 2-Repeatable 3-Defined 4-Managed 5-Optimizing	(0-Incomplete) 1-Performed 2-Managed 3-Defined 4-Quant. Managed 5-Optimizing
Process Areas	18 KPAs	18 PAs	23 PAs	22 PAs

Note:
CMM and Capability Maturity Model are registered in the U.S. Patent and Trademark Office.
CMM Integration and CMMI are service marks of Carnegie Mellon University

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Work Product Alignment

	SW-CMM® (Ver 1.1-1993)	SE-CMM® (Ver 1.1-1995)	FAA-iCMM® (Ver 1 - 1997)	CMMI-SE/SW(SM) (Ver 1.1 2001)
Terminology	Common Features Containing Key Practices	Base & Generic Practices	Base & Generic Practices	Specific & Generic Practices
Generic Practices	4 Common Features per KPA	11 Features 26 Practices	4 Goals 27 Practices	5 Goals 17 Practices
Typical Work Products	None	Linked to Base Practices	Linked to Base Practices	Linked to Specific Practices

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What's Common Among the Models?

General organization along same structure:

- Process areas grouped by category
- Models have functional attributes (what to do) and general attributes (how well you do it)
- Practices/activities are linked to goals
- Performance evaluation characterized with capability/maturity levels
- Practices suggest work products

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Which Way to Turn?

- Base organizational processes on a CMM® ?
- Tailor organizational processes to fit a CMM®?
- Tailor a CMM® to support organizational processes?
- Verify organizational processes against a CMM®?

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What's Common Among Engineering Organizations Seeking CMM® Ratings?

Generally produce similar work products:

- Concept of operation
- Requirements and architectures
- Interface documentation
- Design documentation
- Test and integration documentation
- System documentation

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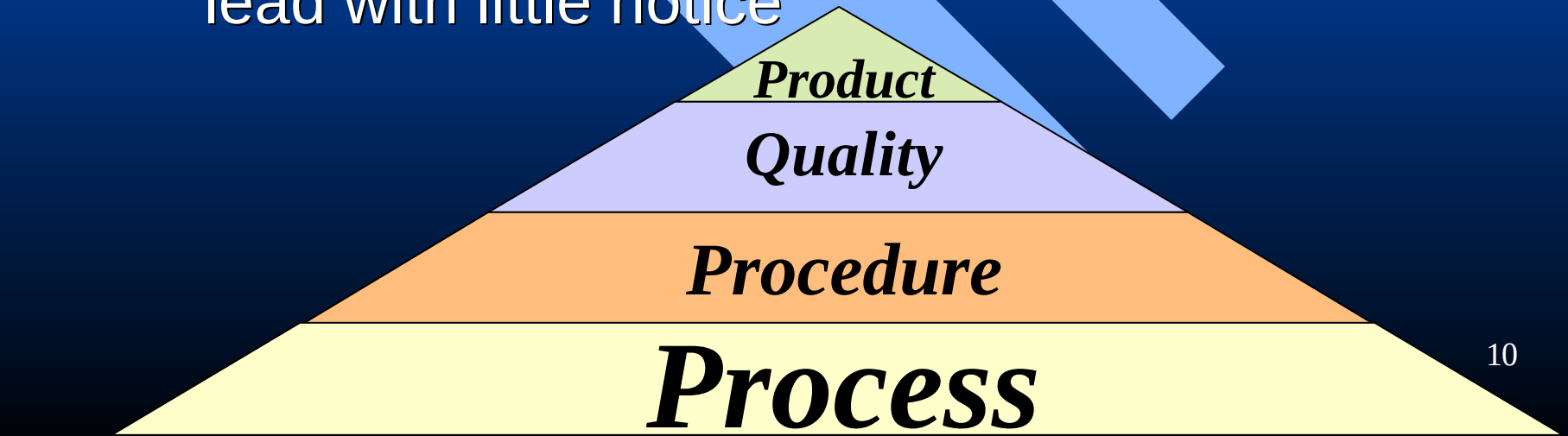
What's Common Among Engineering Organizations Seeking CMM® Ratings?

- We often work in integrated environments
- We are seldom responsible for the entire lifecycle of a project
- We require flexibility to function either as a team lead or a team player
- We require resilience to move from player to lead with little notice



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At Issue!

- We attempt to transfer our experience into new work
- But new work is often in significantly different environments
- We may have different CMM® performance requirements in our new work efforts
- **Why not develop cross-model tracing that allows our organizations to link our work products to any model?**

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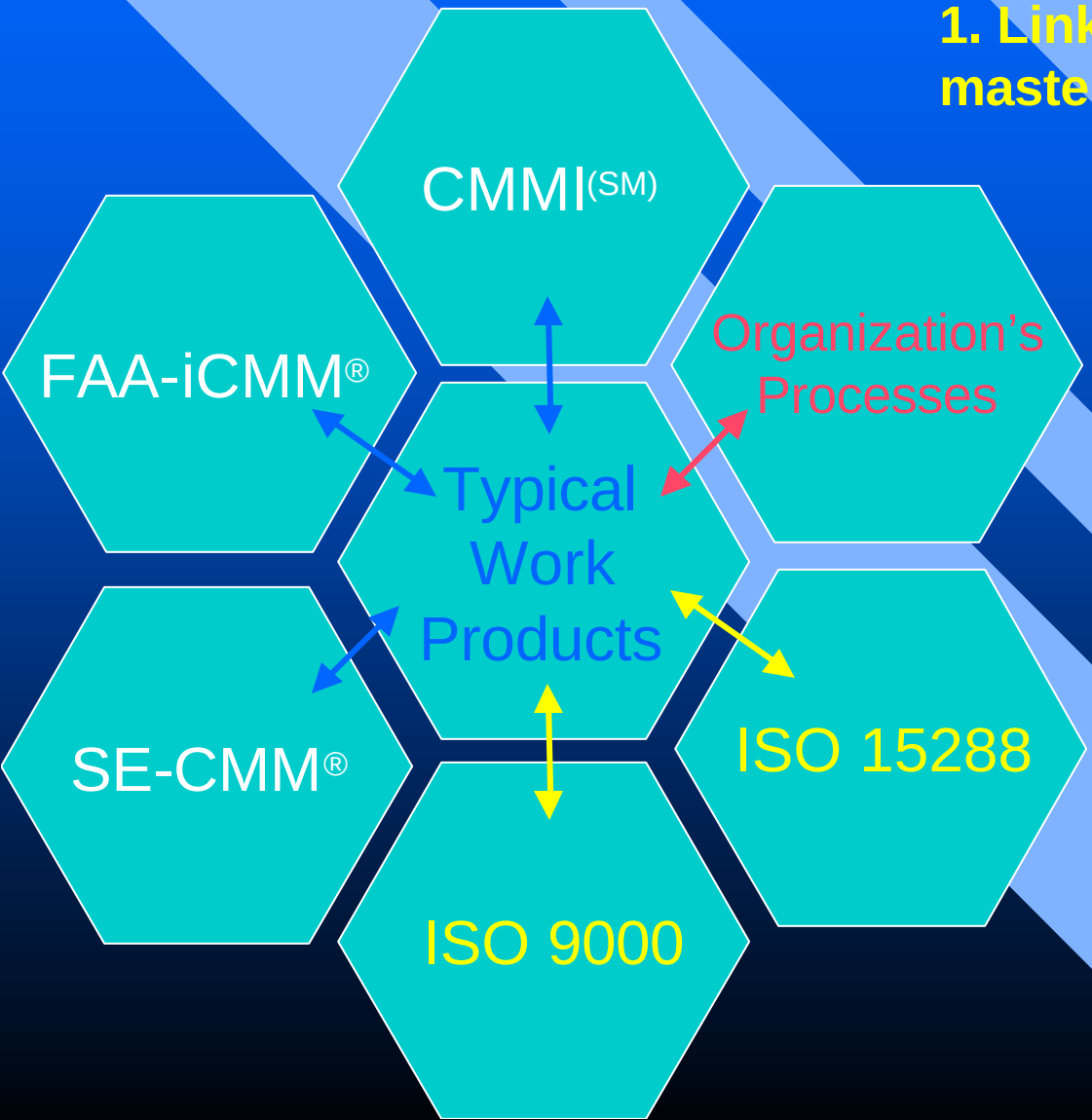
The Concept!



1. Link models to a CMM®-derived master Typical Work Products list
2. Align organization work products to the master Typical Work Products list
3. As new models and standards are incorporated, link models to master Typical Work Product list
4. Evaluate remaining work products that are not associated to the organization's work products to see if they are required

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Background

- A 500+ person effort employing personnel from over 30 companies
- Common processes important to the smooth running of the program
- Currently assessed at capability level 3 in 12 process areas and capability level 4 in two process areas of SE-CMM®

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Appraisal History

- Nov 98 — Management commits to level 3 system engineering program
- Feb 99 — Baseline self-appraisal — Results in institution of training program
- Dec 99 — Follow-on self-appraisal — Results in processes implementation action plan
- May 00 — SEPG initiated
- Jan 01 — External appraisal — Four level 2 process areas, four level 3 process areas
- Feb 01 — Process improvement plan 2001 (PIP01) — Results in implementation of 7 additional processes
- Mar 01 — Initiation of measurement program
- Mar 02 — External appraisal — Twelve level 3 process areas, two level 4 process areas
- Mar 03 — Target level 4 appraisal in five additional process areas

14 Months

12 Months

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Large Team Issues

- SEPG comprised of representatives from many companies and numerous engineering disciplines
- Training essential to get all on the same sheet of music
- Processes must cover a wide variety of work products and levels of engineering activity

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Why SAIC Built This Application

This tool has been built to:

- Trace our organizational practices to the SE-CMM® and iCMM® with greater fidelity
- Assist in moving the our organization from SE-CMM® to CMMI(SM)

Prototype Tool Demonstration

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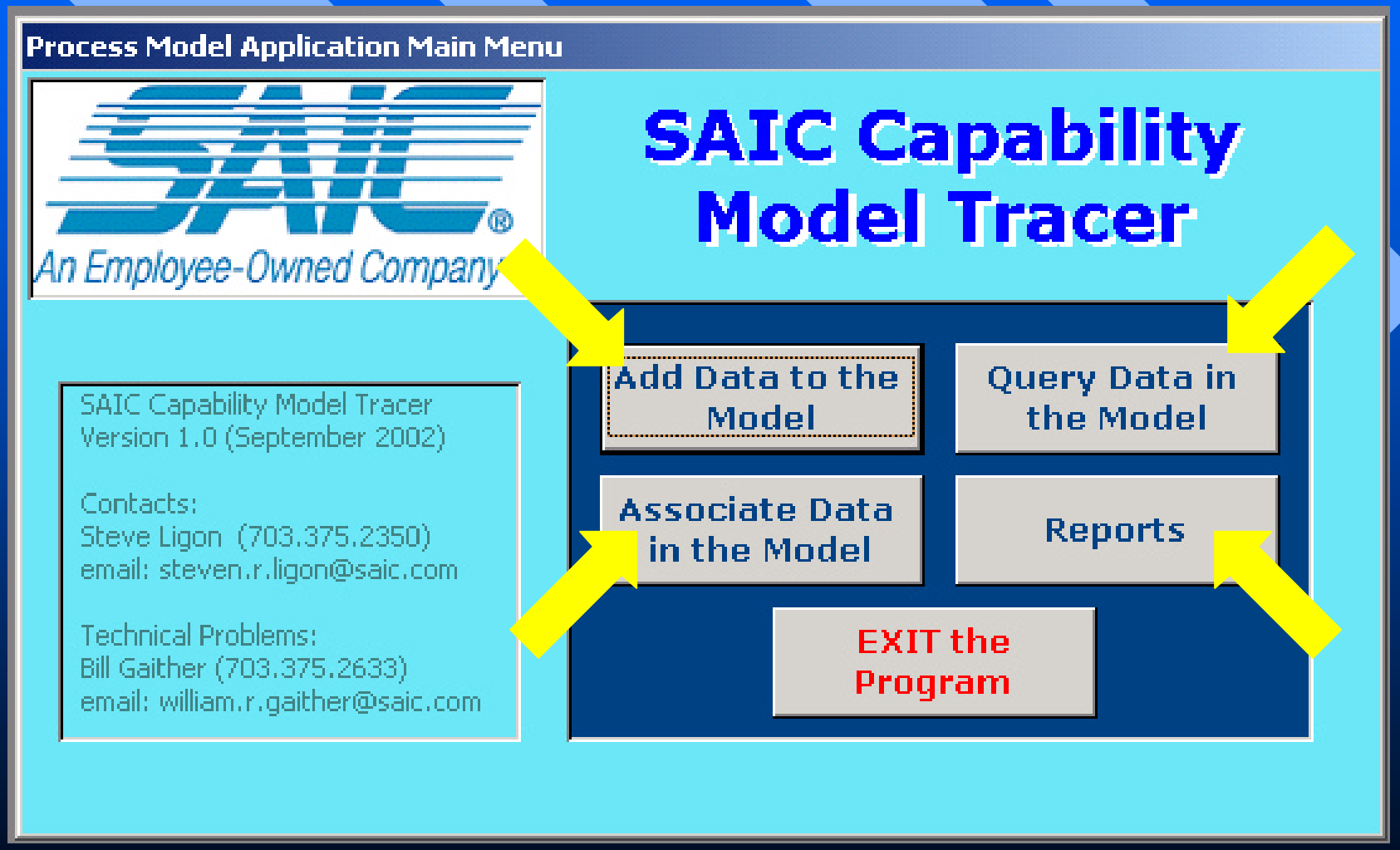
Introductory Screen



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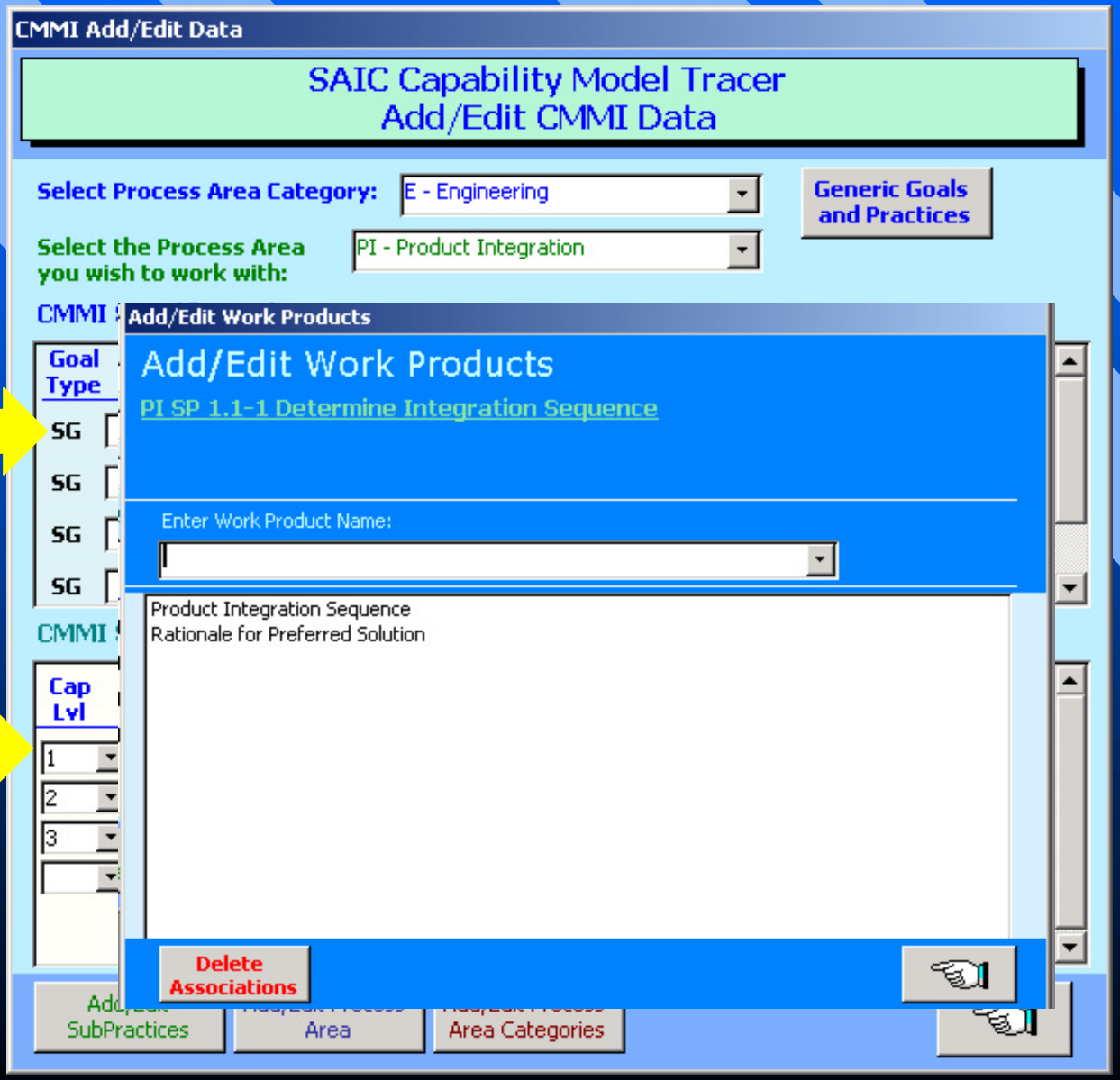
Simple Data Input



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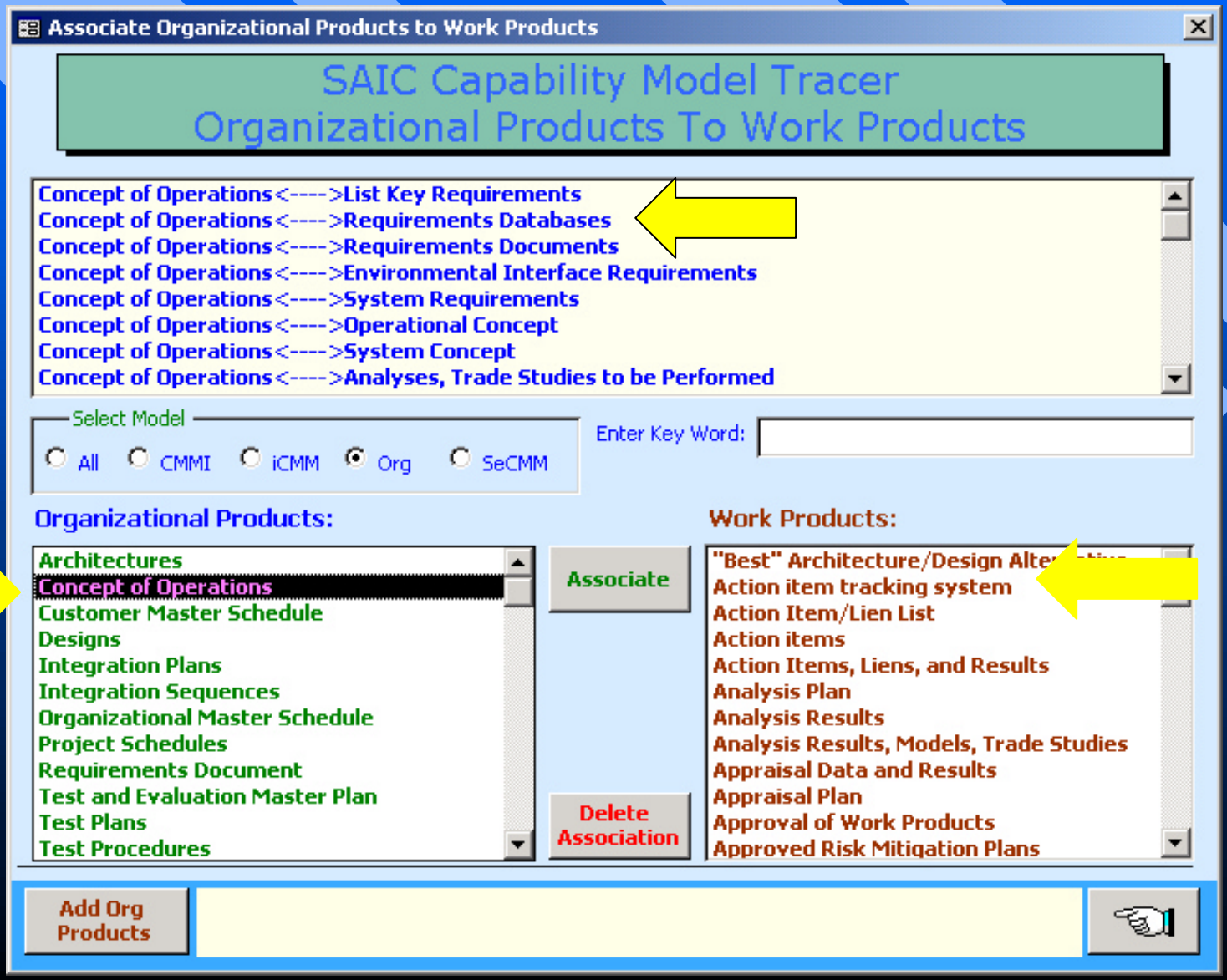
Associating Organizational and Model Work Products



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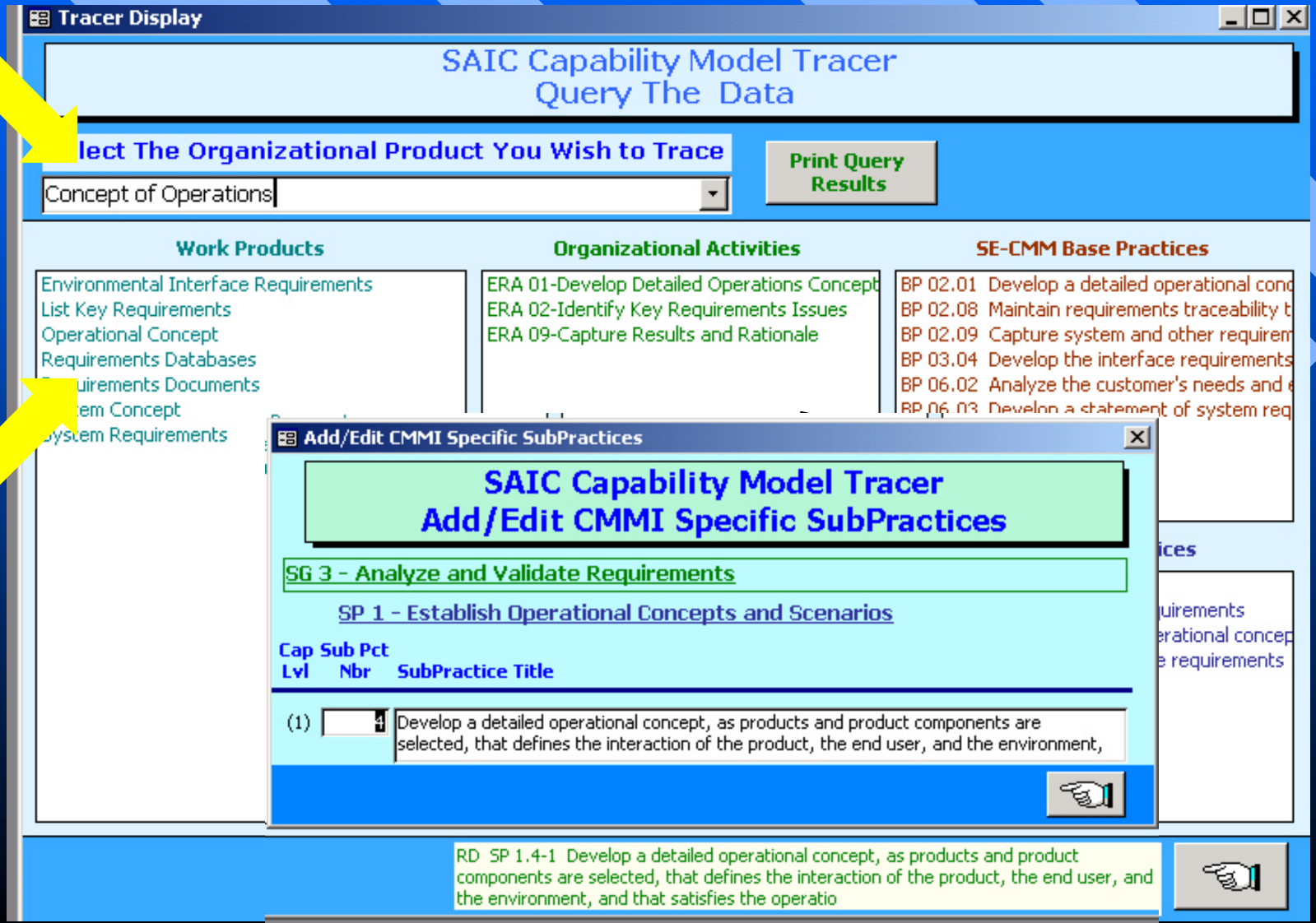
The Desired Outcome: Cross-Model Tracing



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Useful Reports for Verifying Data Integrity

SAIC Capability Model Tracer
Unassigned Work Products

The following Work Products have not been associated with an Organizational Product:

A list of project integrated teams
Acceptability and evaluation criteria
Acceptance Documents
Acceptance documents for the received product components
Acceptance reports addressing system element interfaces
Acceptance test procedures
Acceptance test results
Acquisition Program Baseline
Acquisition strategy
Acquisition Strategy Paper
Action item list
Action item lists
Action item tracking system
Action Item/Lien List
Action items
Action items for updating interfaces
action items or recommendations for changes
Action items tracked to closure
Action Items, Liens
Action Items, Liens, and Results
Action proposal

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Useful Reports in Preparing for Evaluations

SAIC Capability Model Tracer

Organizational Product: ConOps-Concept of Operations

Work Product: Environmental Interface Requirements

SE-CMM Base Practices

BP 03.04	Develop the interface requirements for the selected architecture components

Work Product: List Key Requirements

Organizational Activities:

ERA.02	Identify Key Requirements Issues

Work Product: Operational Concept

Organizational Activities:

ERA.01	Develop Detailed Operations Concept

SE-CMM Base Practices

BP 02.01	Develop a detailed operational concept of the interaction of the system, the user, and the environment, that satisfies the operational need
BP 06.02	Analyze the customer's needs and expectations to develop a preliminary operational concept of the system

CMMi Practices

RD SP 1.1-1	Develop operational concepts and scenarios that include functionality, performance, maintenance, support, and

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Summary

- Tracing from existing organizational processes that produce good products to maturity models gains staff buy-in and saves time
- Work products provide the “least common denominator” for cross-model tracing
- Establishing a repository of work product tracing facilitates flexibility in movement from one model to another, and increases responsiveness to new customer-mandated models and standards

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Any Questions

Steve Ligon
ligons@saic.com
(703) 375-2350 (office)
(703) 375-2145 (fax)