Carnegie Mellon
Software Engineering Institute – Europe

Frankfurt, Germany

Towards a Unified Process Improvement Approach (UPIA)

ESEPG 2006 Workshop

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Agenda

Overview and Goal

Bringing Order to the Quagmire

UPIA's Metadata-Based View Concept

Outline of Benefit Analysis

Next Steps

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Problem Statement

Proliferation of multiple models

Different structures and terminologies

Failure to recognise model commonality

Conflict between different improvement programs (silos)

Business risks associated with process improvement are high

Lack of sustainability and institutionalization

Explosion of audits and assessments for businesses

Improvement potential not achieved

Goals for Workshop

1. Present our concept
2. Validate the concept with you
3. Collect additional input to help refine concept
4. Identify possible collaboration partners

Agenda

Overview and Goal
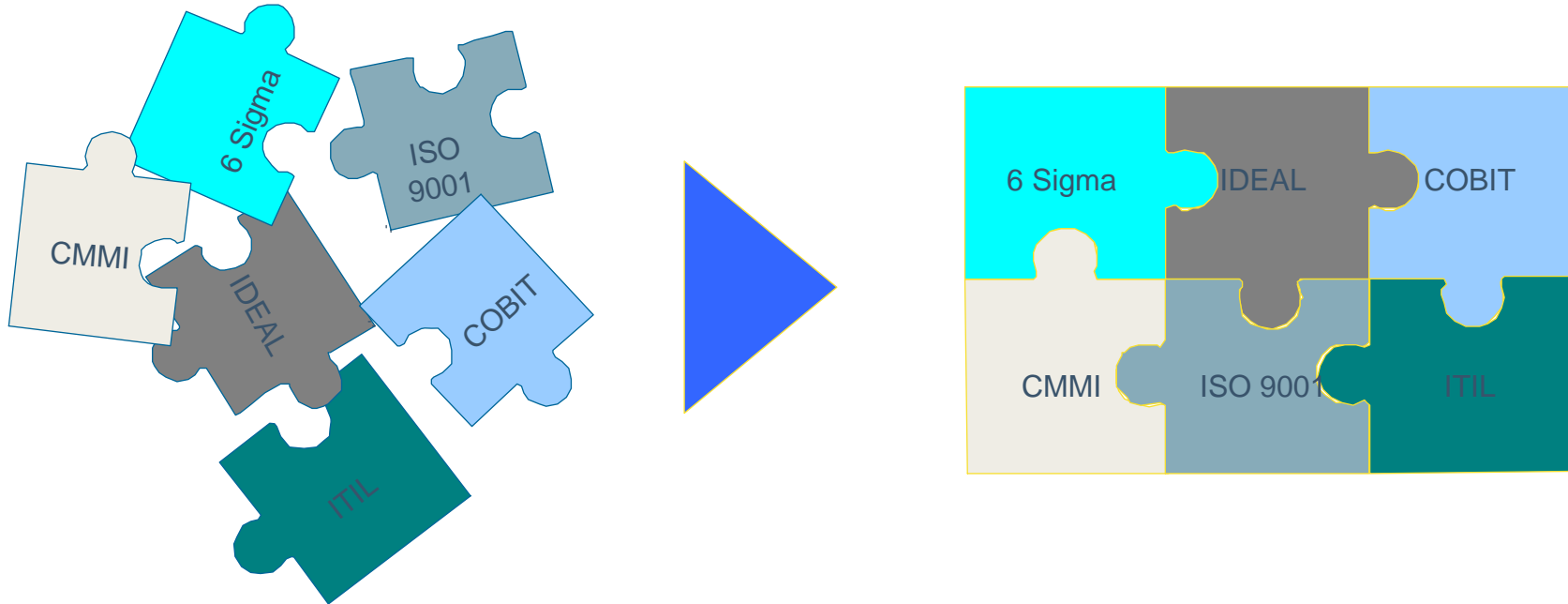
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Taking a new look at the quagmire

- What is common among the elements?
- Can we derive a common view of these elements?
- How can we help the different stakeholders in their daily work with the elements?

Model Element Classification

Institutionalization Elements	Good-Practice Elements	Improvement Methods
How ingrained is what we do?	What are we doing?	How do we change what we do?

Good Practice Elements

These are the model elements that define **what** an organization needs to improve

- Examples: CMMI, ISO 9001, COBIT, ITIL, ...

How do we use these elements?

- View the model elements as requirements on the organization's process landscape

- Always place the organization's processes in focus of improvement effort

- Improvement initiatives need to be aware of commonality across models and of the total impact on the organization's processes

Improvement Methods

These are the model elements that **drive the change** and **facilitate the technology transition processes** in the organization. They comprise organizational structures, roles, processes and methods.

- Examples: IDEAL, TQM, Six Sigma, OPF, OPD, L4, L5, assessments, ...

- **How do we use these elements?**

- Select what will best suit your organizational culture from all available models

- Apply a single, uniform approach across all improvement initiatives

- Avoid using different transition methods for different models, especially where the practitioners are the same!

- Establish improvement infrastructures (long-term) to aid achievement of improvements

Institutionalization Elements

These are the model elements that help in **sustaining achieved improvements.**

- Examples: CMMI Generic Goals and Practices

How do we use these elements?

- Use a unified, common set of goals and practices across all models addressed to ensure effective institutionalization.
- If necessary, define own elaborations for Generic Practices to address processes not included in CMMI
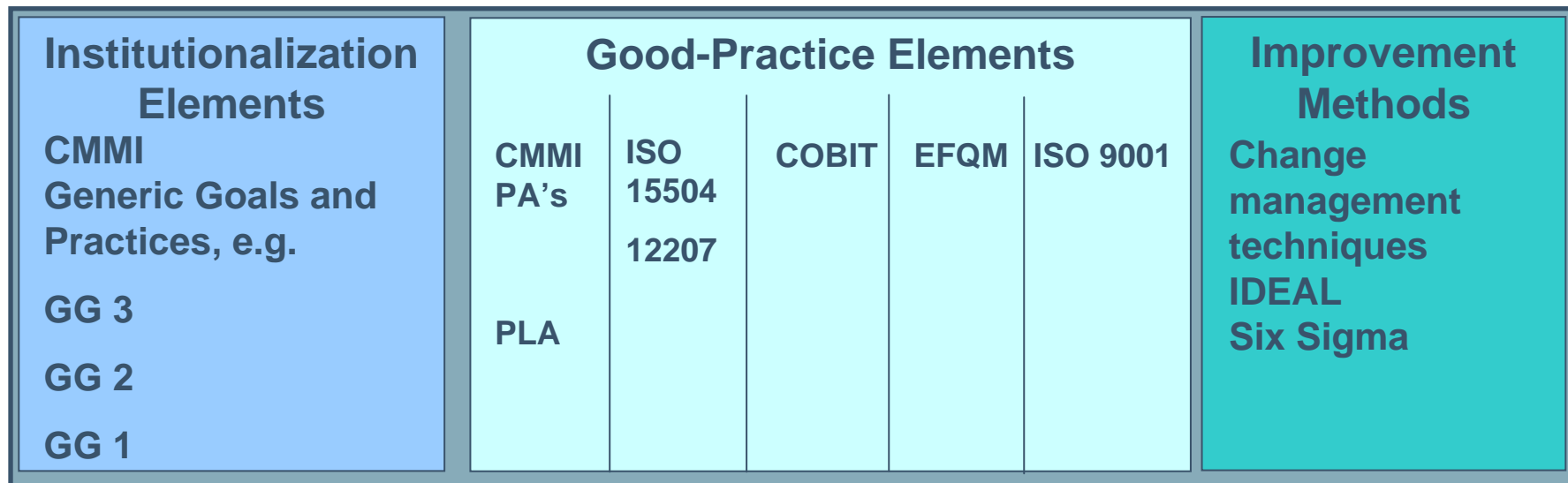
Unified Process Improvement Approach (UPIA)

Institutionalization Elements	Good-Practice Elements					Improvement Methods
CMMI Generic Goals and Practices GG 5 GG 4 GG 3 GG 2 GG 1	CMMI PA's P-CMM TSP PSP PLA & others	ISO 15504 12207 & others	COBIT ITIL SOX & others	EFQM & others	ISO 9001 ISO 61508 ISO 16949 & others	Change management techniques IDEAL Six Sigma Lean Six Sigma TQM Assessment & Audit Methods & others

UPIA – An Instantiation

Institutionalization Elements	Good-Practice Elements					Improvement Methods
CMMI Generic Goals and Practices, e.g. GG 3 GG 2 GG 1	CMMI PA's PLA	ISO 15504 12207	COBIT	EFQM	ISO 9001	Change management techniques IDEAL Six Sigma

Implemented in Organization's Process

Process 1	Process 2	Process 3	Process n

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Bringing Order to the Quagmire

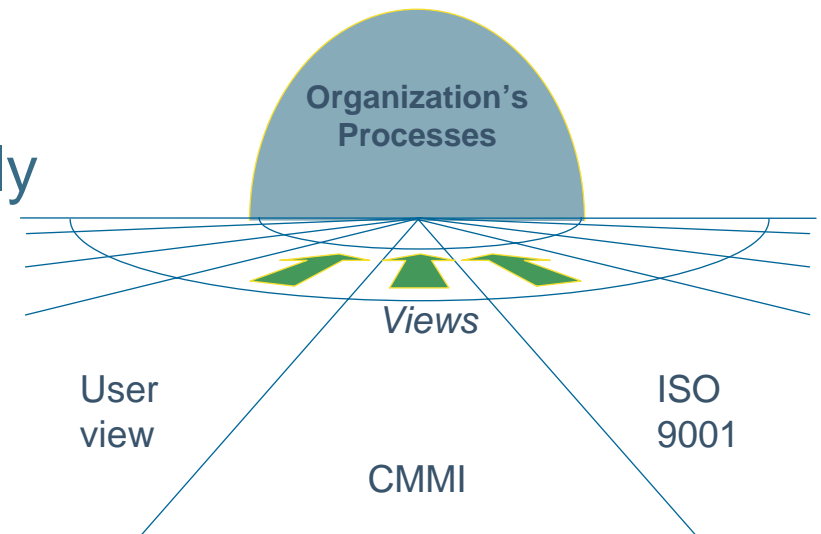**UPIA's Metadata-Based View Concept**

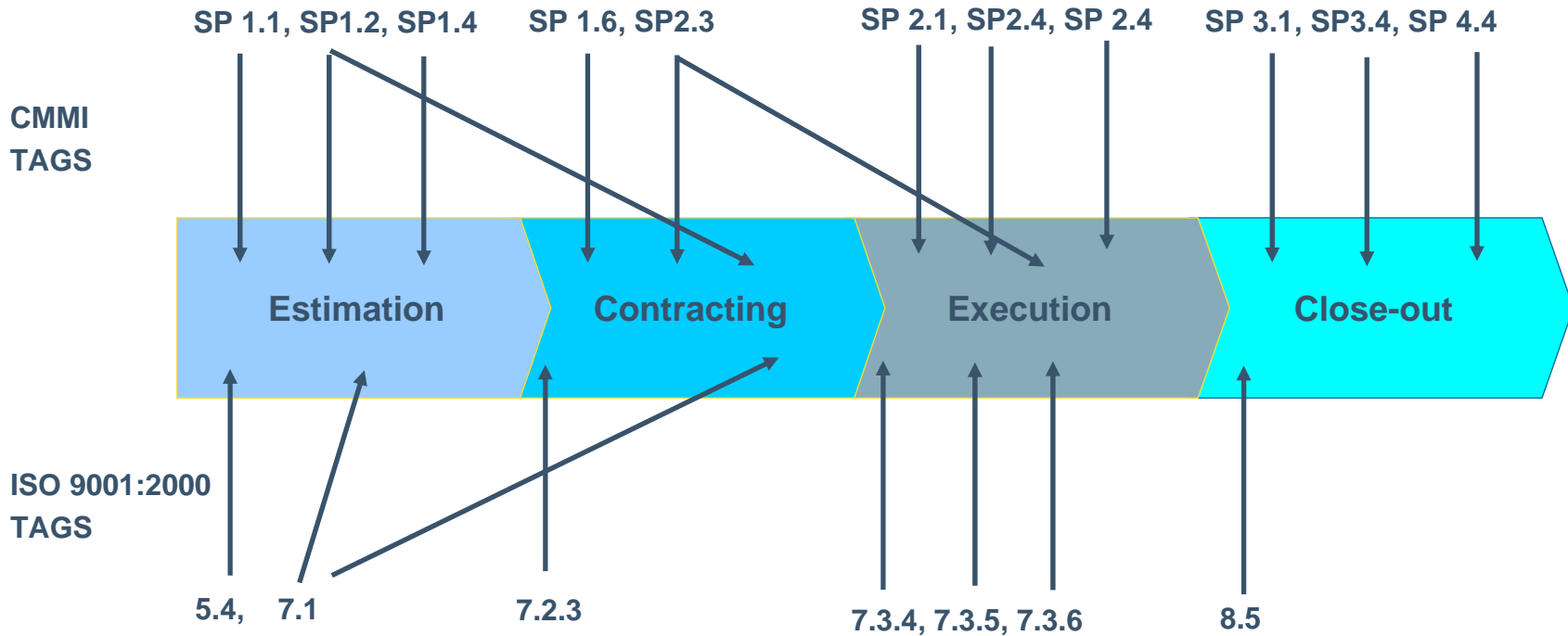Outline of Benefit Analysis

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Views - relating the organization's processes to source models

- The end user is familiar with the organization specific processes

- The sources which lead to the organizations processes are largely transparent to the end user

- Stakeholders view and assess the organization's processes from different source models

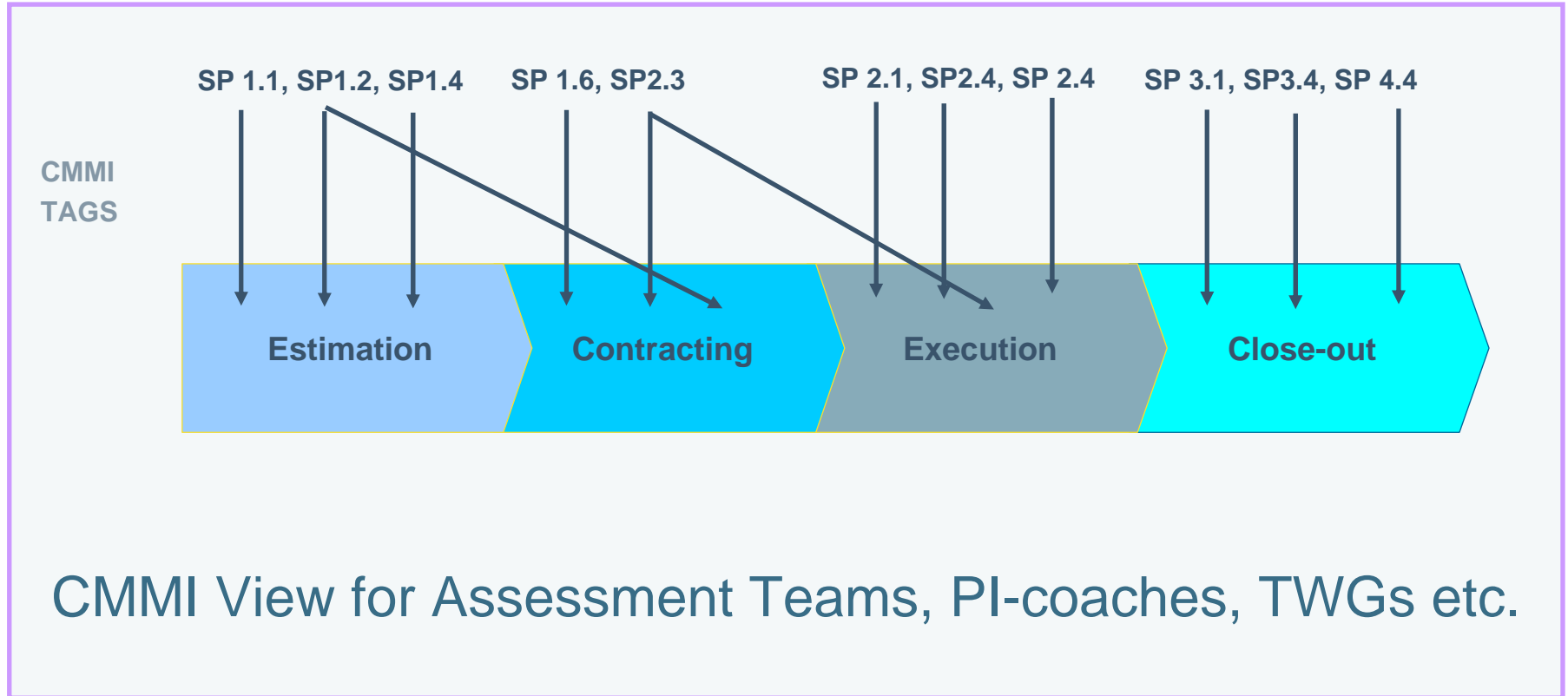- UPIA should provide different "Views" in terms of source models

Organization's Processes

Views

User view

CMMI

ISO 9001

Metadata links between good-practice models and your process

SP 1.1, SP1.2, SP1.4   SP 1.6, SP2.3   SP 2.1, SP2.4, SP 2.4   SP 3.1, SP3.4, SP 4.4

**CMMI
TAGS**

Estimation   **Contracting**   **Execution**   **Close-out**

**ISO 9001:2000
TAGS**

5.4,   7.1   7.2.3   7.3.4, 7.3.5, 7.3.6   8.5

Metadata enabled Views – 1/2

CMMI
TAGS

SP 1.1, SP1.2, SP1.4   SP 1.6, SP2.3   SP 2.1, SP2.4, SP 2.4   SP 3.1, SP3.4, SP 4.4

| Estimation | Contracting | Execution | Close-out |

CMMI View for Assessment Teams, PI-coaches, TWGs etc.
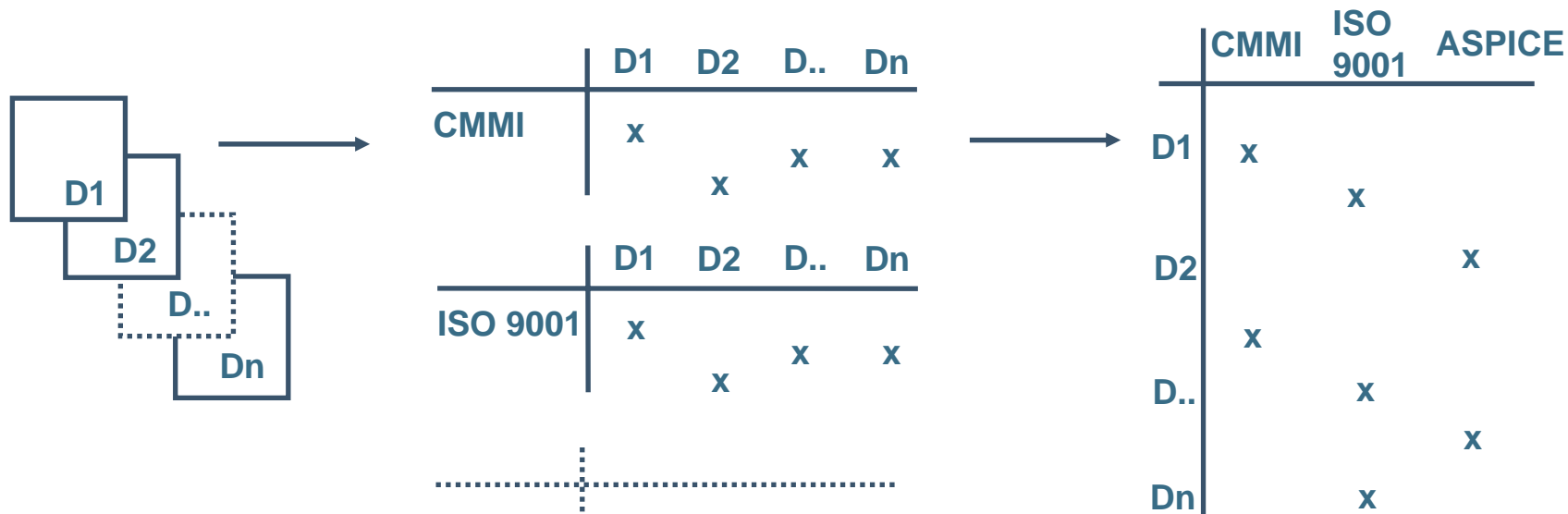
Metadata enabled Views – 2/2

- Use PIIDs to generate mappings for CMMI and others

- Enable identification of cross organizational unit lessons learned and good practices

- Verify using "model-to-model" mappings

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UPIA Benefits overview

Model diversity addressed through unified approach

Different structures and terminol-
ogies mapped to own process

Model commonality transparent
through metadata approach

Less conflict through unified
improvement programs

Business risks associated with
process improvement reduced

Common approach to sustain-
ability and institutionalization

Views help reduce the impact of
audits and assessments

Improvement potential achieved

Business Case for UPIA

- We are working within a specific customer context to generate a business case for UPIA
- We have identified cost and benefit drivers in this specific context

UPIA Benefit Drivers

B1:

    Establish a unified process improvement infrastructure to support business objective achievement in a multi-model environment

B2:

    Reduce documentation related costs in a multi-model environment

B3:

    Reduce audit/assessment related costs in a multi-model environment

B4:

    Intangible results, like foundation for future, competitive advantage, motivation, etc.

UPIA Cost Drivers

C1:

UPIA project management

C2:

Organizational changes

C3:

Documentation re-structuring

C4:

Supporting tools

C5:

External support

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Next Steps for UPIA

- Develop a concept for a comprehensive implementation of UPIA
  - How to select and execute Improvement Methods across improvement programs
  - How to run improvement cycles that integrate several models
  - How to select and integrate relevant Good-Practice Elements
  - How to execute metadata tagging
  - How to generate and use common institutionalization standards
- Pilot UPIA in commercial setting: SEI is actively searching for partners in industry

Any Questions?
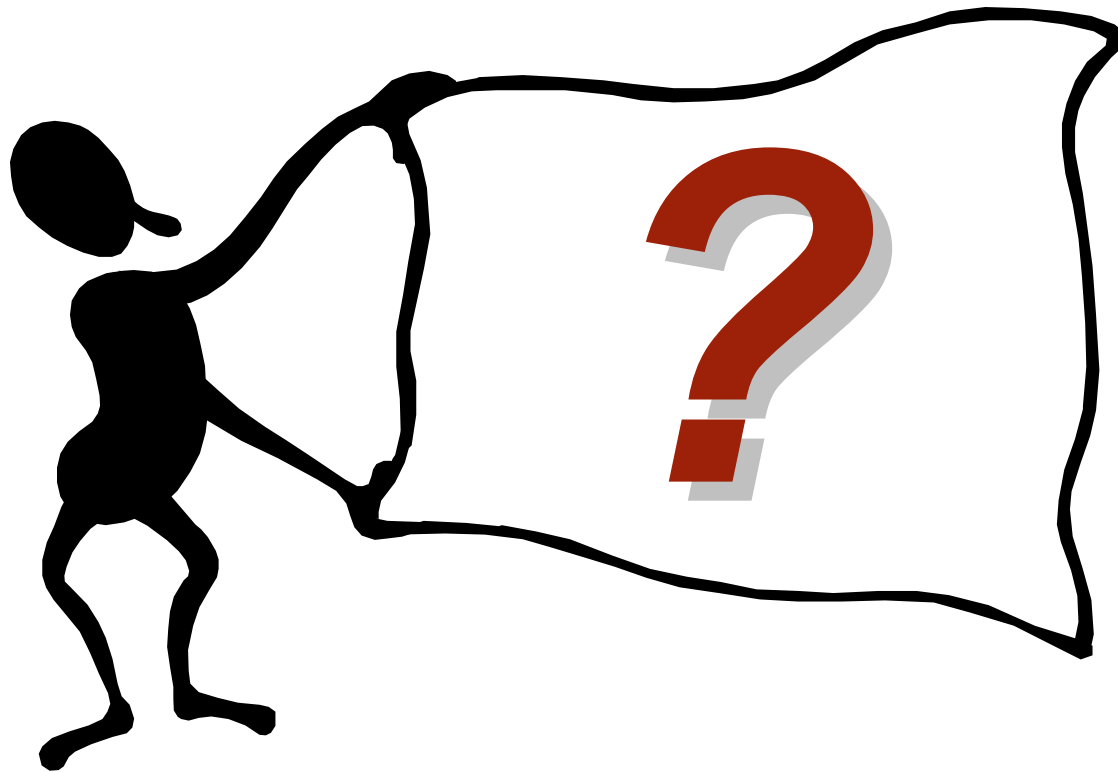
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