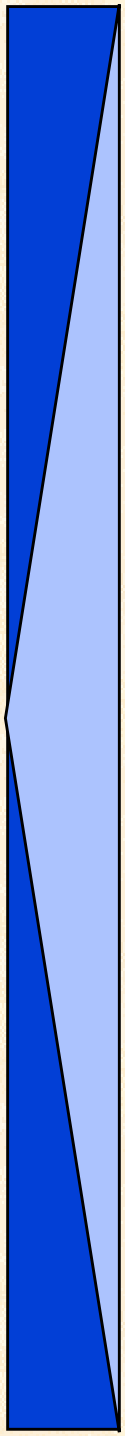


The OOSPICE Project: Capability Assessment for CBD Methodology

Presenter:

Brian Henderson-Sellers

COTAR, UTS

Preview

OOSPICE = Software Process Improvement and Capability dEtermination for OO

- The overall project architecture and its work products
- Process Model, Process Reference Model, Process Assessment Model

OOSPICE Project Partners are:

SEA, Kepler University Linz (Austria)

Computer Associates (Belgium)

WAVE Solutions Information Technology (Austria)

Huber Computer Datenverarbeitung GmbH (Austria)

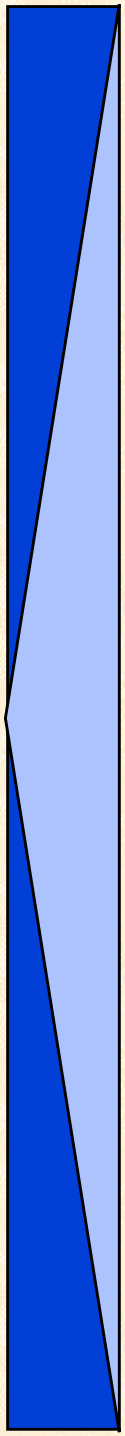
University of Boras (Sweden)

Volvo Information Technology (Sweden)

Griffith University (Australia)

COTAR, UTS (Australia)

We also wish to thank the EU and ARC for funding and Middlesex University (UK) for earlier participation



CBSE or CBD aims to increase quality of products. Focus is on the *interface*

Development split between

a) application design

b) component provisioning

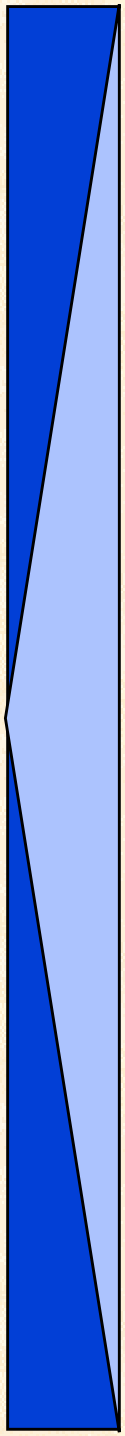
c) application assembly ("integration centric")

SPI/SPA focusses on process evaluation and improvement through, especially,

a) CMM, CMMI

b) SPICE (ISO 15504)

c) ISO 12207



OOSPICE project combines capability assessment and CBD. Objectives include creation of

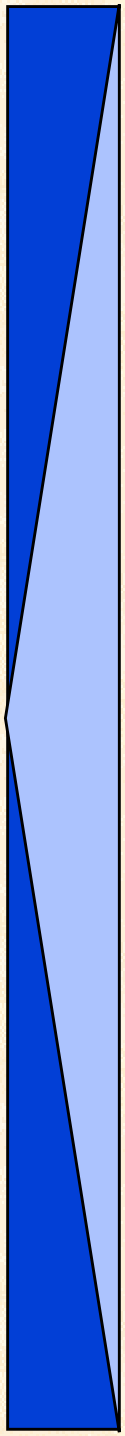
a) unified CBD process model and underpinning metamodel

b) CBD methodology

c) CBD assessment methodology (=assessment model + assessment method + assessment software tool)

Problem faced by companies adopting/using CBD approach include

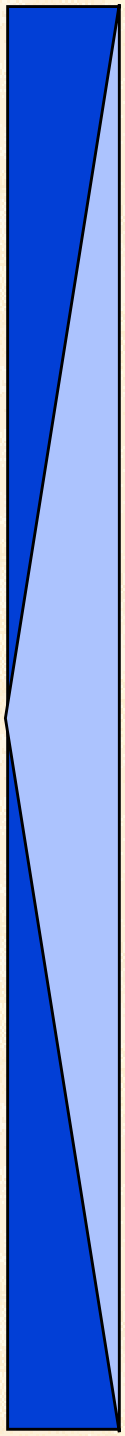
- lack of skills
- inappropriate organizational structure
- inappropriate development processes/methodologies
- inappropriate management approaches e.g. for risk evaluation
- information regarding availability of components is deficient
- culture of mistrust for third-party components
- no information on capability of component suppliers
- components often not trusted



OOSPICE project focusses on questions such as

a) Are there unique aspects of CBD that need new process reference models?

b) Are current assessment approaches suitable?

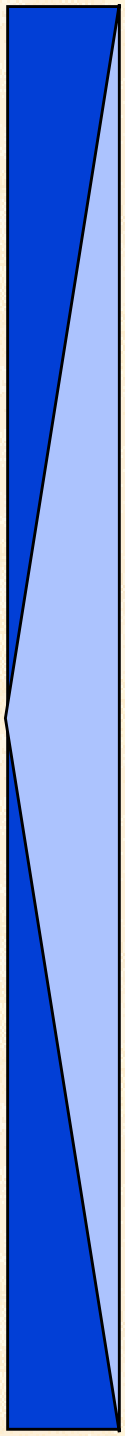


First hassle was/is terminology

- Especially “process”, “process model”, “process reference model”
- Terminology clashes occur from ISO standards versus OO (OPEN and Catalysis major inputs on OO side)

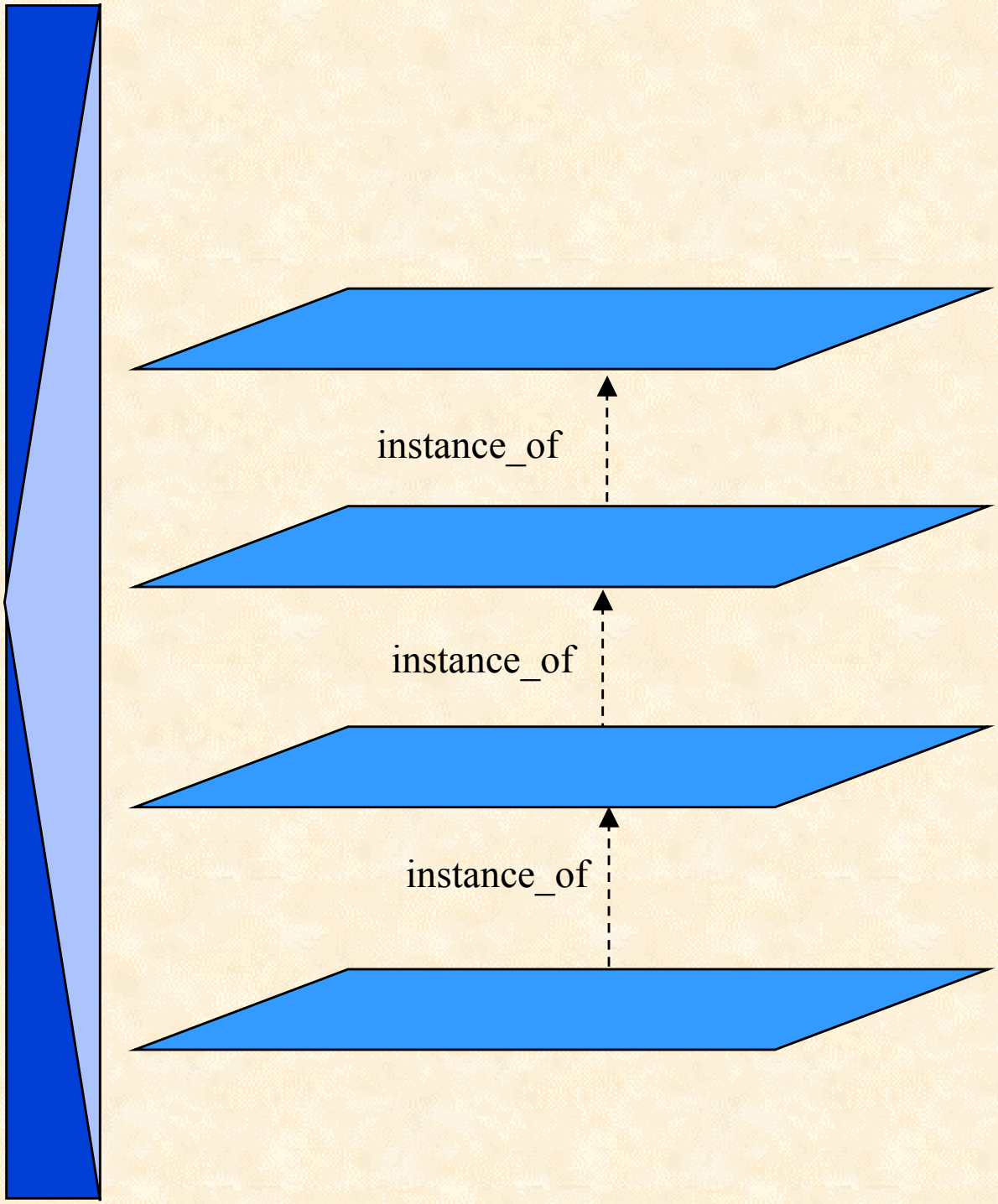
Table 1. Terminology mapping between ISO standards, OPEN and OOSPICE (after Henderson-Sellers et al.*, 2002)*

Description of term	**Name in 15504**	**Name in 12207**	**Name in OPEN**	**Name in OOSPICE**
Totality often exemplified by its documentation (external *and* internal)	Documented process	Software Life Cycle Process	Process	Methodology
Collection of definitions of process components, with full documentation on (external) specification	Process Dimension	N/A	Set of Process Components	Process Model
Something transforming inputs to outputs. Also, an individual, documented instance of an M2 level definition	Process	Process	Activity (a kind of Process Component)	Process
Mid-range conversion of inputs to outputs	N/A	Activity	Task	Task
Smaller scale conversion of inputs to outputs	N/A	Task	No special name – essentially steps within the Task description	
Full process in enactment	N/A	N/A	Process Instance	Implemented Processes



The underlying architecture is based on the four-layer (metamodelling) framework of the OMG. We take the UML architecture and adapt it as shown in next two slides.

OMG/UML examples

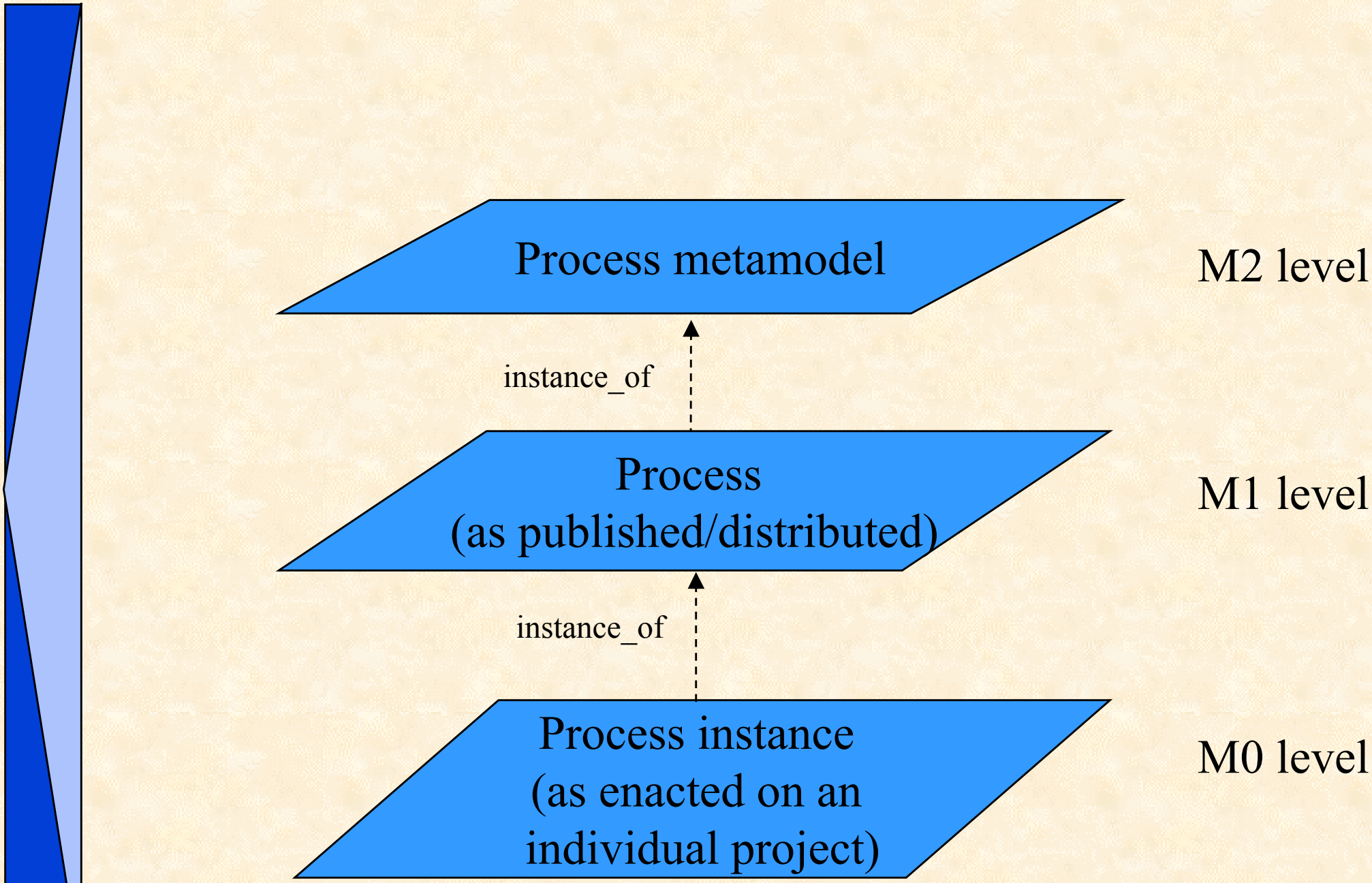


M3 MOF

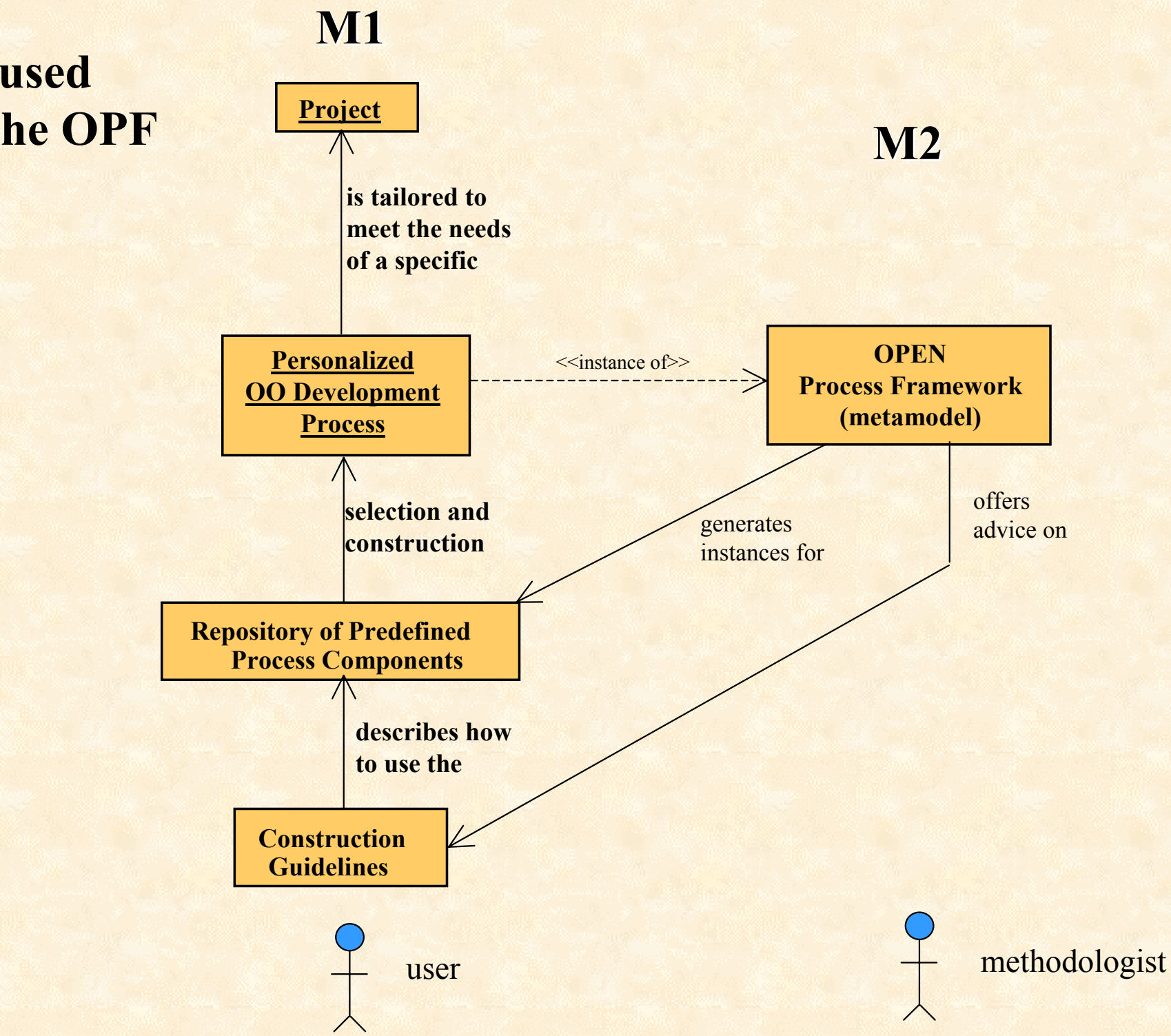
M2 UML Metamodel

M1 Model

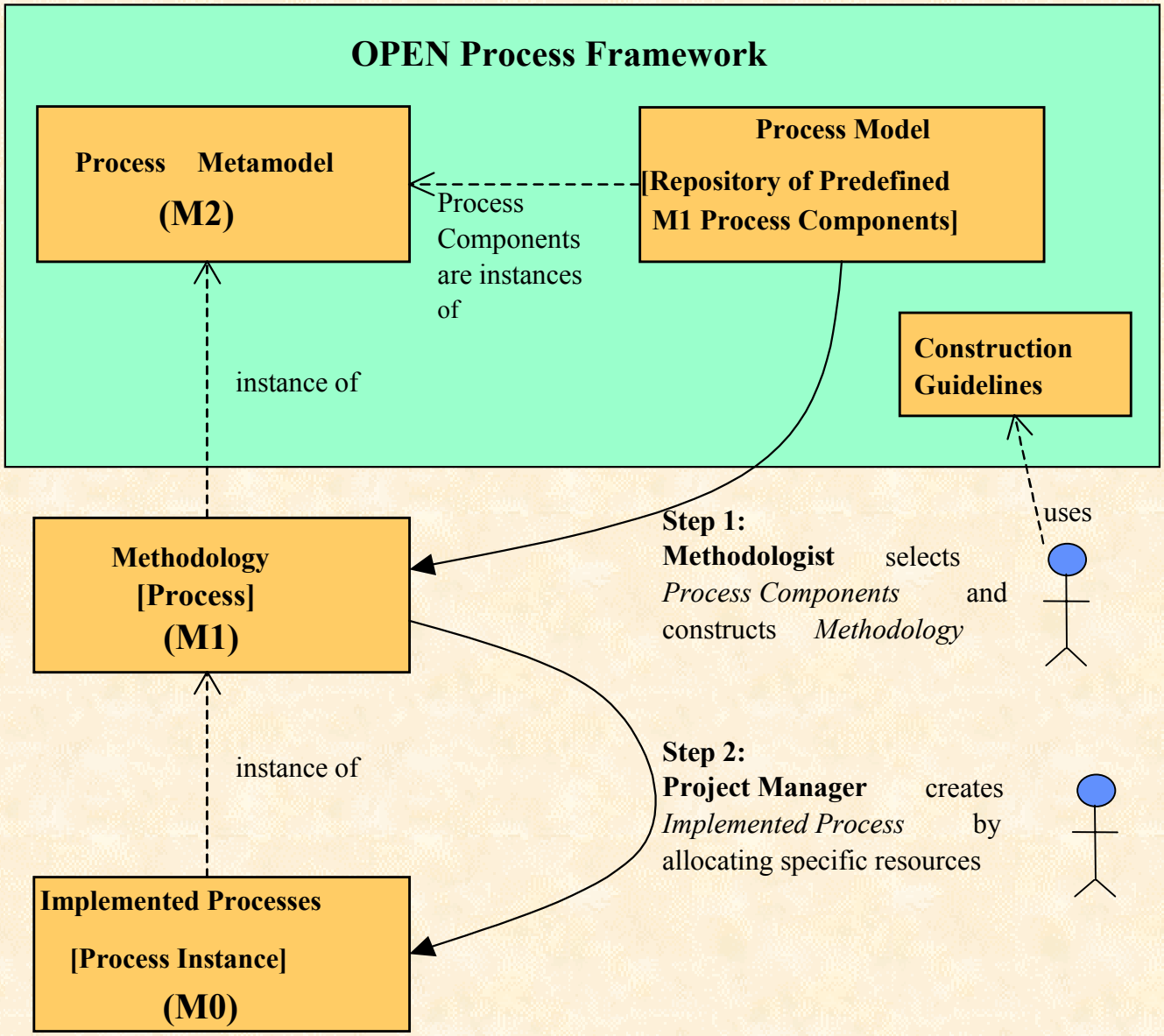
M0 Data


Process metamodel
M2 level
instance_of
Process
(as published/distributed)
M1 level
instance_of
Process instance
(as enacted on an
individual project)
M0 level

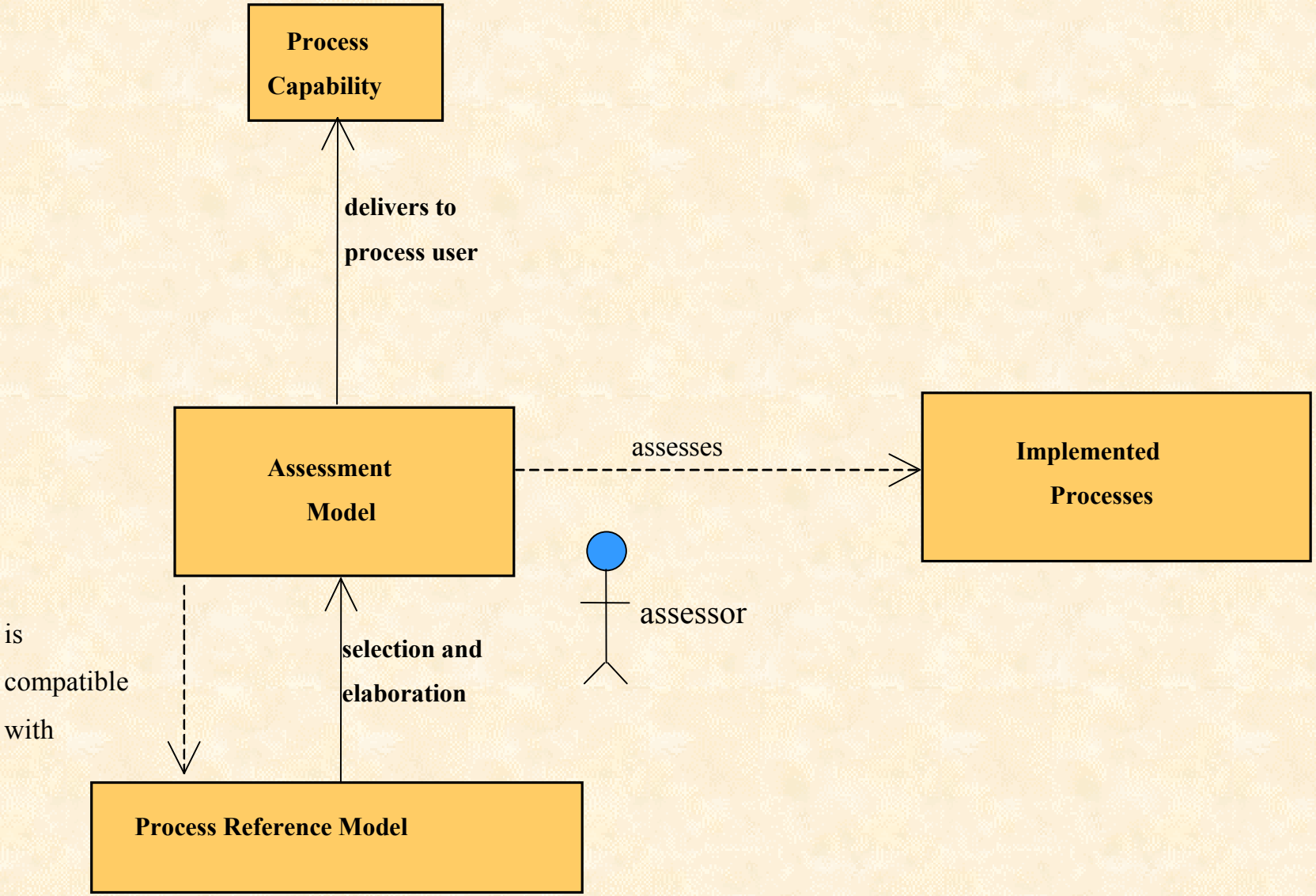
As used in the OPF



Mapping to OOSPICE



A similar depiction for the Assessment component



Process Reference Model (PRM) defines *only*

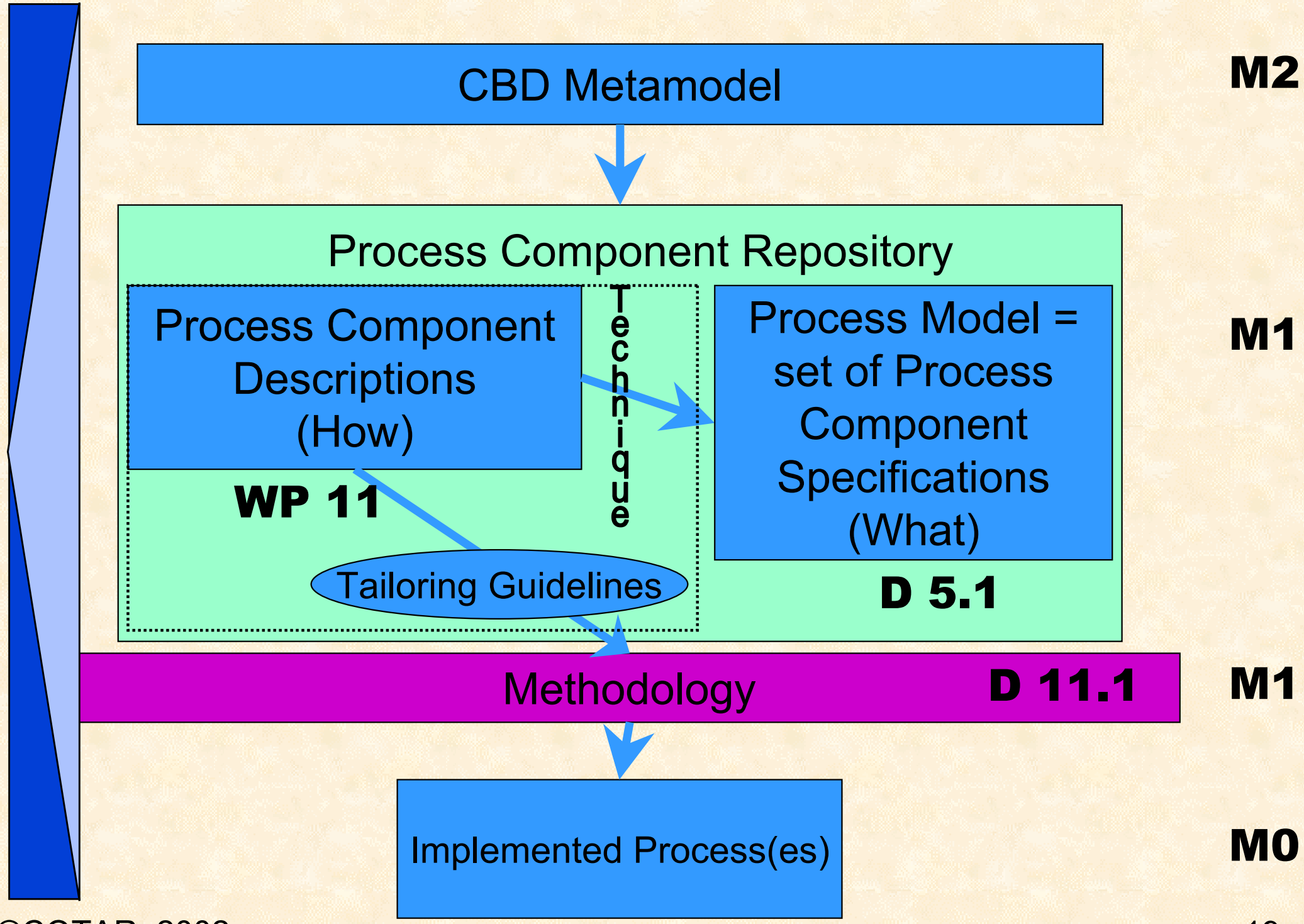
a) purpose

b) outcomes

PRM is basis for the assessment methodology

OOSPICE **Process Model** also defines (but does not elaborate on) appropriate Tasks to achieve the purpose and outcomes and associated Work Products

OOSPICE Process Model is similar to OPEN's process component repository. It consists of many "processes" (using the word at the same granularity as ISO15504 and 12207).


CBD Metamodel
M2
Process Component Repository
Process Component Descriptions (How)
WP 11
Technique
Process Model = set of Process Component Specifications (What)
D 5.1
M1
Tailoring Guidelines
Methodology
D 11.1
M1
Implemented Process(es)
M0

- D5.1 has created a set of process components (called “processes” in OOSPICE terminology) described in terms of tasks but without any details about how these tasks should be accomplished. This information is to be added as the major focus of WP11 in which Techniques are introduced along with Tailoring Guidelines.
- Together this all permits the construction, in WP11, of a family of M1 level methodologies that industry can use directly.

OOSPICE processes are grouped: 8 groups, 3 of which focus on technical (or "engineering") processes. Here is where the greatest impact of components lies e.g.

- Component provisioning strategy may be
  - develop components in-house
  - outsource
  - purchase pre-built components
  - wrap existing systems

A number of new processes are required

Table 1. OOSPICE CBD Processes by Process Categories (OOSPICE Partners, 2002)

Customer-Supplier	**Support**
Acquisition Preparation	Maintenance
Supplier Selection	Configuration Management
Supplier Monitoring	Documentation
Customer Acceptance	Problem Resolution
Supply	Joint Review
Customer Support	Verification
Operational Use	Validation
	Product Evaluation
	Quality Assurance
	Audit
	Usability
Modelling	**Management**
Domain Engineering	Programme Management
Business Modelling	Project Management
Requirements Engineering	Risk Management
Behaviour Specification Architecture	Measurement
Provisioning Strategy	Quality management
User Interface Specification	Infrastructure
Application Assembly	**Organisation**
Application Internal Design	Process Establishment
Component Assembling	Process Assessment
Application Testing	Process Improvement
Application Delivery	Asset Management
Component Selection	Reuse Programme Management
Component Provisioning	**Human Resources**
Component Internal Design	Human Resource Management
Component Testing	Training
Component Delivery	Knowledge Management
Legacy Mining	

Remember, CBD Process Model has

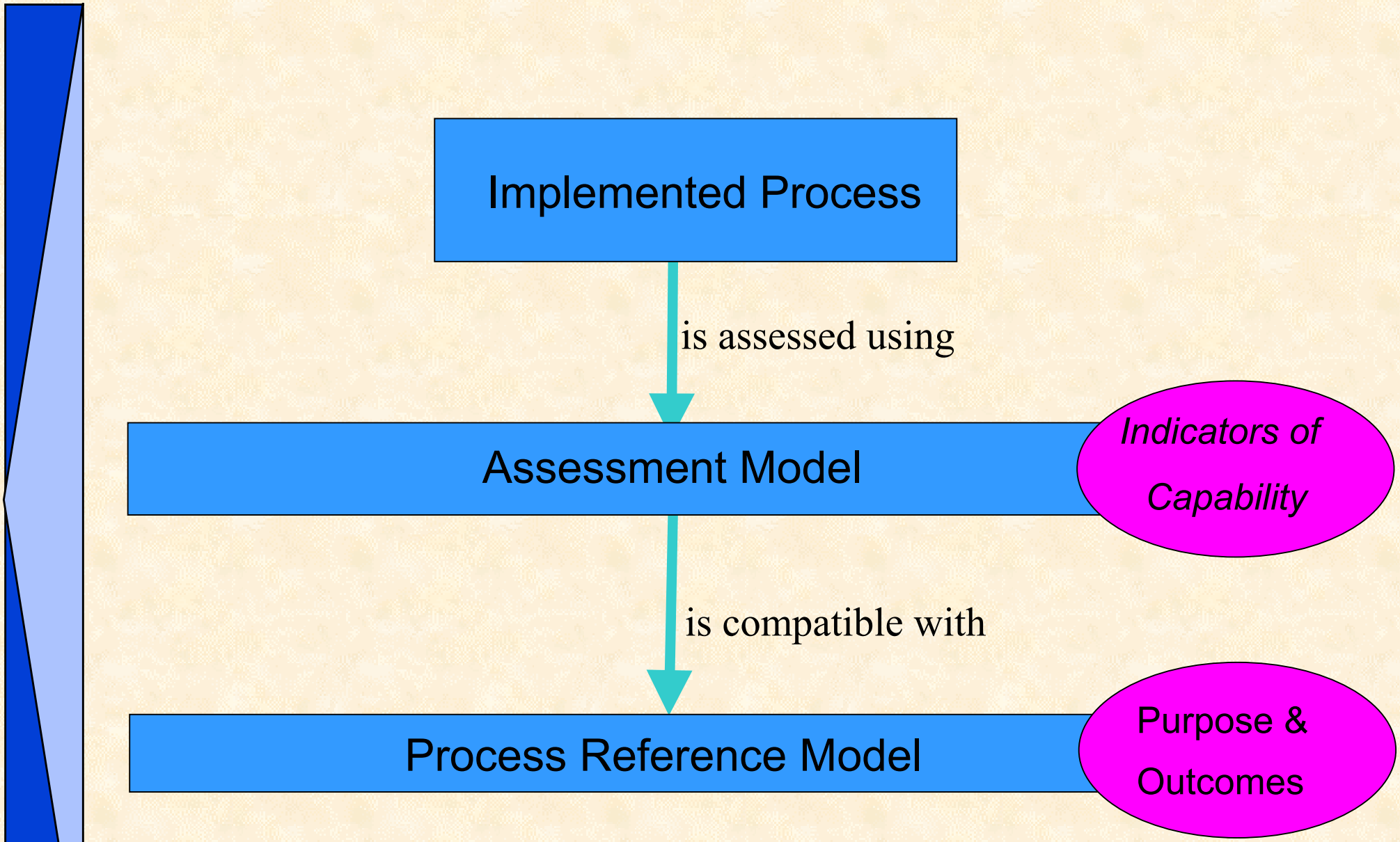
- Name
- Purpose
- Outline
- Tasks
- Inputs
- Outputs

Whereas CBD PRM has only

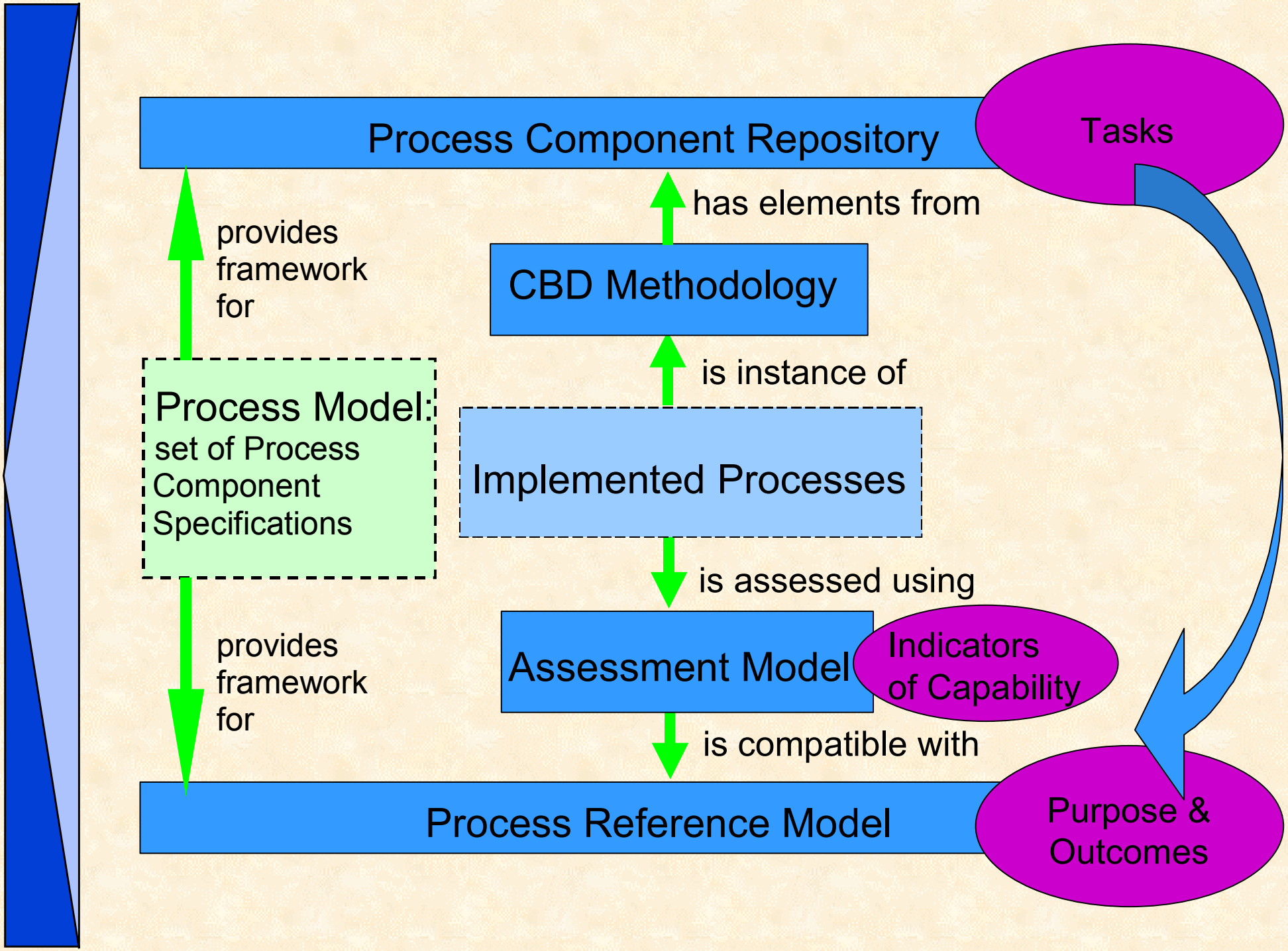
- Name
- Purpose
- Outcomes

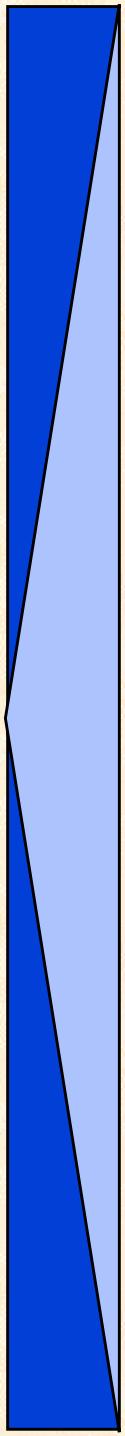
where outcomes demonstrate success in achieving purpose

On the assessment side, a process implemented on a specific project requires assessment. This requires the availability of a process assessment model which in turn needs a process reference model. This PRM is described in terms of purpose and outcomes for all its constituent processes.


Implemented Process
is assessed using
Assessment Model
Indicators of Capability
is compatible with
Process Reference Model
Purpose & Outcomes

Adding together the diagrams for "methodology" and for "assessment" shows that the process reference model used for assessment and the process model created in preparation for the methodology are very similar in scope. They both describe processes in outline only. The difference is that the PRM uses the terminology of outcomes and purpose and the Process Model uses the terminology of Tasks.


Process Component Repository
Tasks
has elements from
provides framework for
CBD Methodology
is instance of
Process Model: set of Process Component Specifications
Implemented Processes
is assessed using
provides framework for
Assessment Model
Indicators of Capability
is compatible with
Process Reference Model
Purpose & Outcomes



In actual fact, the D5.1 deliverable, bearing this architecture in mind, has included process and outcomes as well as Tasks so that it makes a more solid basis for building both the assessment side and the methodology side of the OOSPICE deliverables.

OOSPICE Assessment Methodology

Assessment Tool

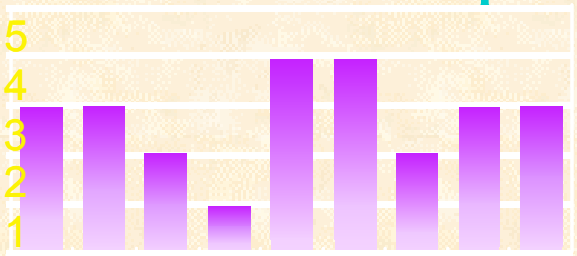
Process Assessment Model

Input

- Purpose
- Scope
- Constraints
- Responsibilities

Process Assessment Method

Output



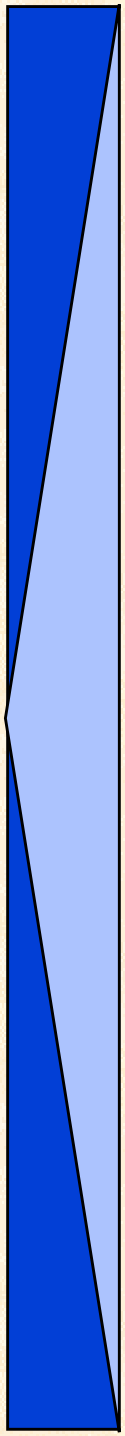
Assessor Training Syllabus & Certification Scheme

Competent Assessors

Process Reference Model

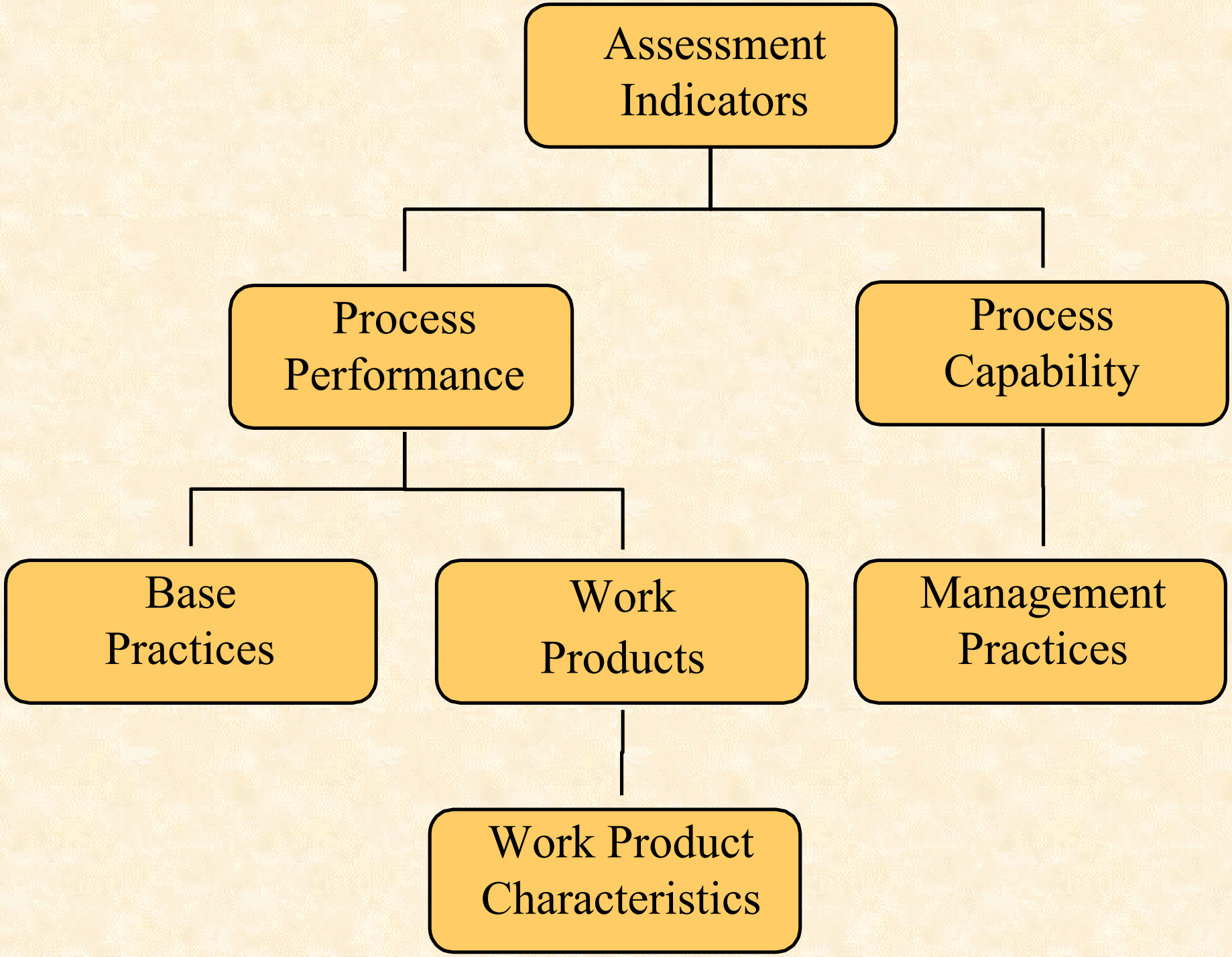
Process Improvement or Capability Determination Guidance

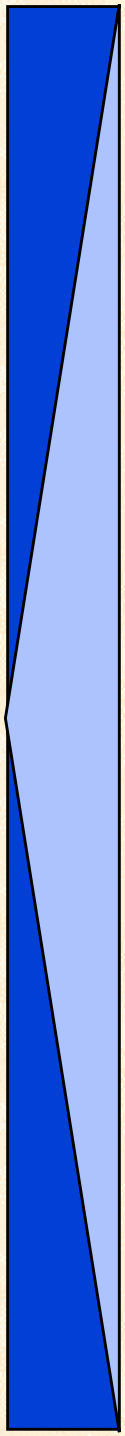
Assessment User Trials



Key is the Process Assessment Method, needing not only the PRM but the PAM (Process Assessment Model).

The PAM has similar scope to the PRM but also provides a comprehensive set of indicators of process performance and capability


Assessment Indicators
Process Performance
Process Capability
Base Practices
Work Products
Management Practices
Work Product Characteristics

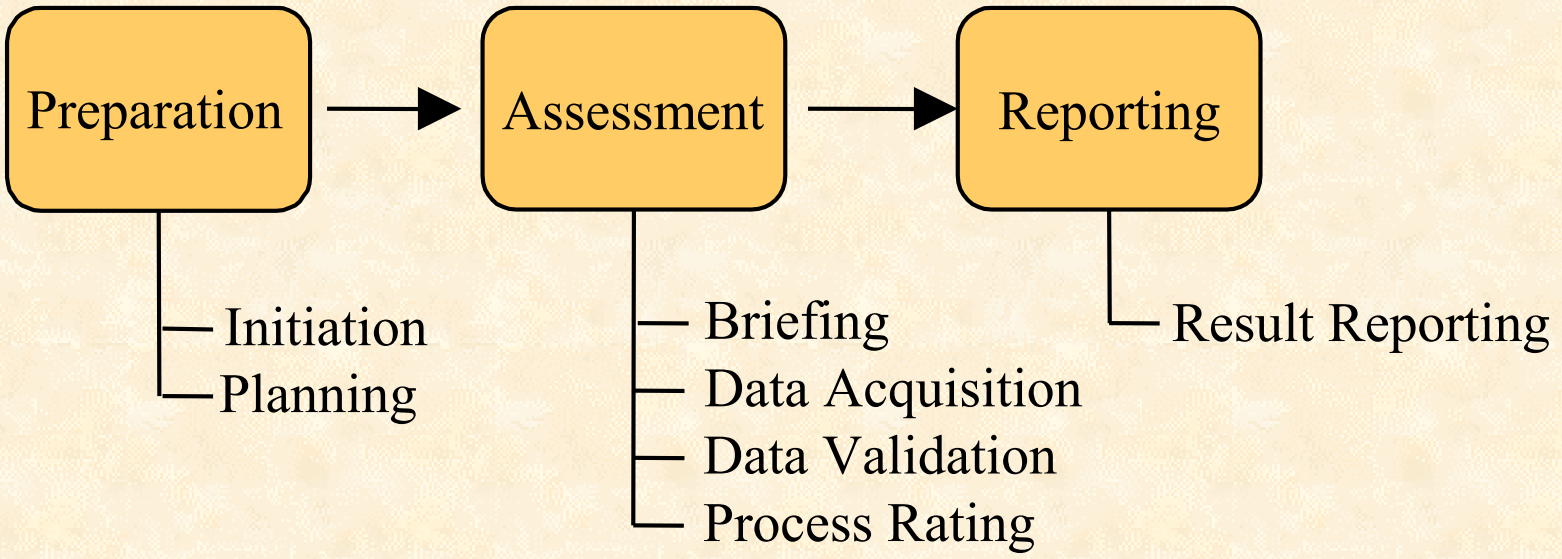


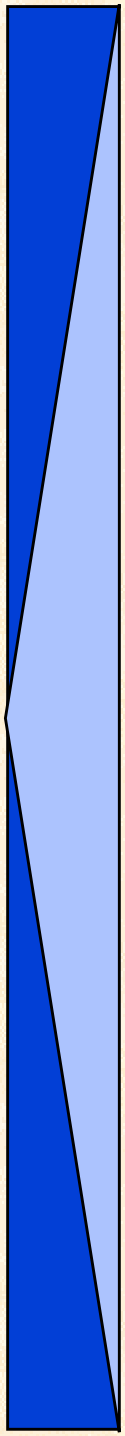
Process performance indicators closely related to process outcomes of PRM. They are process-specific.

Indicators of process capability are generically applicable to all processes in the PRM

Capability is measured on a scale from low to capability to high capability (e.g. SPICE levels 0-5)

Assessment Method is how the investigator will undertake his/her assessment of the organization. Split into three phases: preparation, assessment, reporting. Each phase has a purpose and a set of activities.





Assessment tool is currently being prototyped internally with final version due March 2003.

Demo version to be made publicly available in June 2003 from www.oospice.com

Ongoing Work

- Development of methodology (addition of techniques and construction guidelines + exemplars)
- Development of assessment methodology (assessment model + method + tool)
- Site testing
- Development of metamodel (OPF, SPEM, PICS)

Summary

- The overall project architecture and its work products
- Process Model, Process Reference Model, Process Assessment Model

- website at http://www.oospice.com