Business Process Modeling Notation 2.0 and Tools Interoperability

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Rational. software

EAM15

Agenda

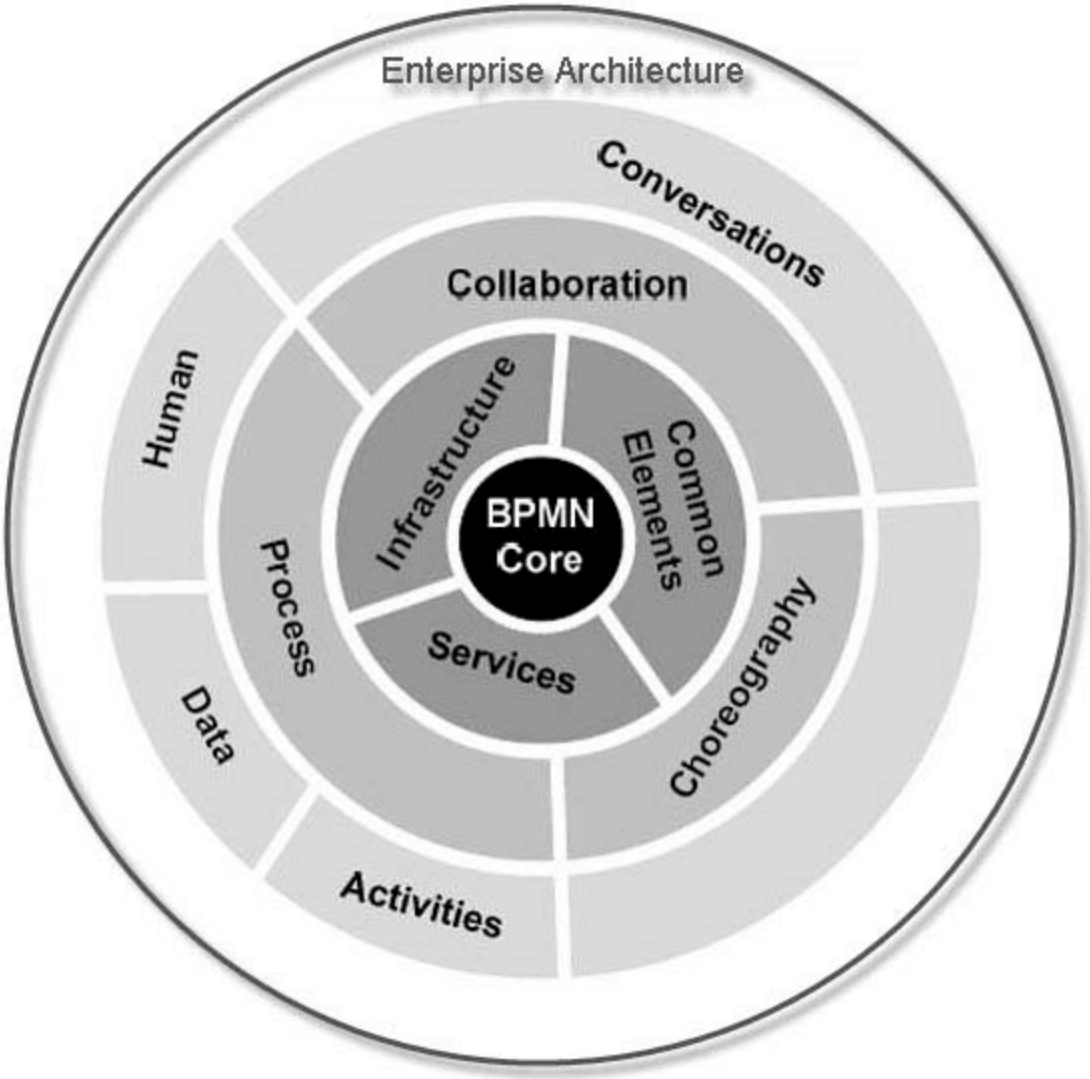
- BPMN 2.0 Review
- Enterprise Architecture and Business Process Management
- Tools Interoperability
- Governance
- Model Management
- Evolving and Exchanging Models
- Summary
- Conclusion
- Q&A

Objectives

- Appreciate
  - What BPMN2.0 has to offer in respect of model interchange
  - The business concepts not handled by BPMN 2.0
  - Enterprise Architecture, BPM, and Tools Interoperability considerations
  - That tools interoperability is about more that just a technical integration
- Note
  - Current thinking within Rational, may not be universally accepted
  - Not a promise of integrations
  - Not necessarily a roadmap

BPMN2.0

- Primary goal of BPMN is to provide a notation that is readily understandable by
  - Business users
  - Technical developers
  - Process monitors and managers
- Visual representation of business processes and execution processes
- Provide an interchange format between different tools.
- BPMN2.0 defines the semantics and notation for the following diagram types
  - Process
  - Collaboration
  - Choreography

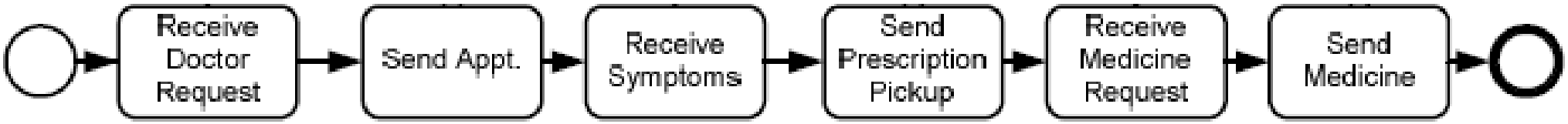


The BPMN 2.0 specification extends the scope and capabilities of the BPMN 1.1 in several areas:

- Formalizes the execution semantics for all BPMN elements
- Defines an extensibility mechanism for both process model extensions and graphical extensions
- Refines event composition and correlation
- Extends the definition of human interactions
- Defines a choreography model

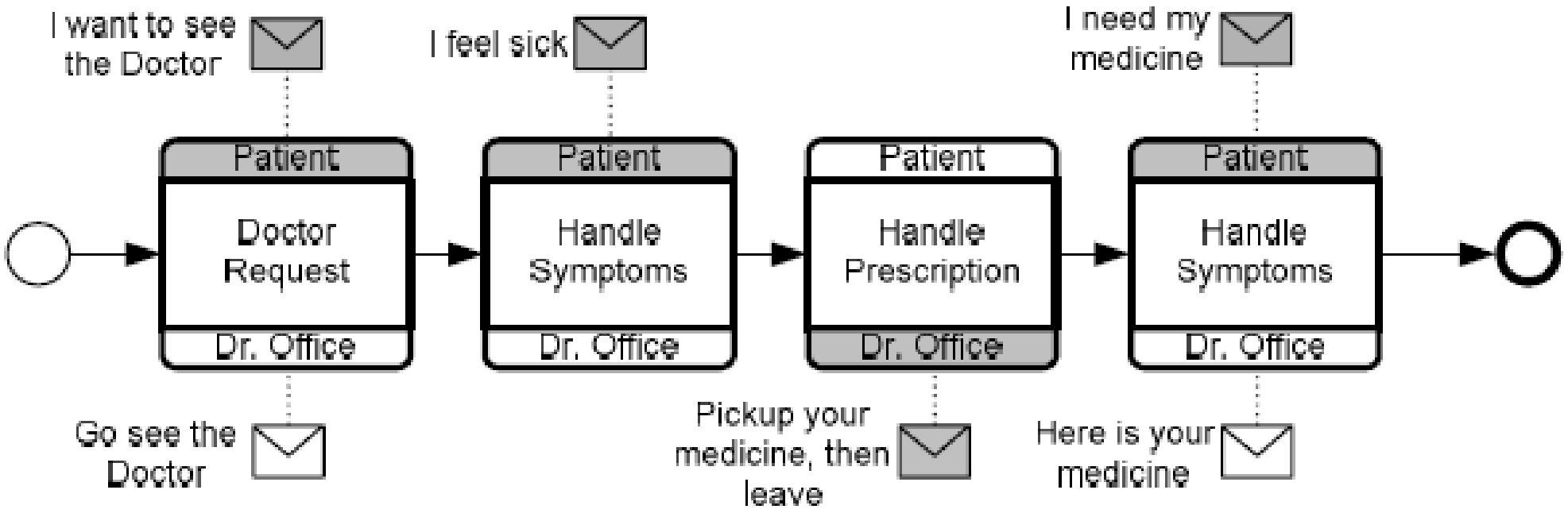
Visual Notation - Process Orchestration

- Show a thread of activities



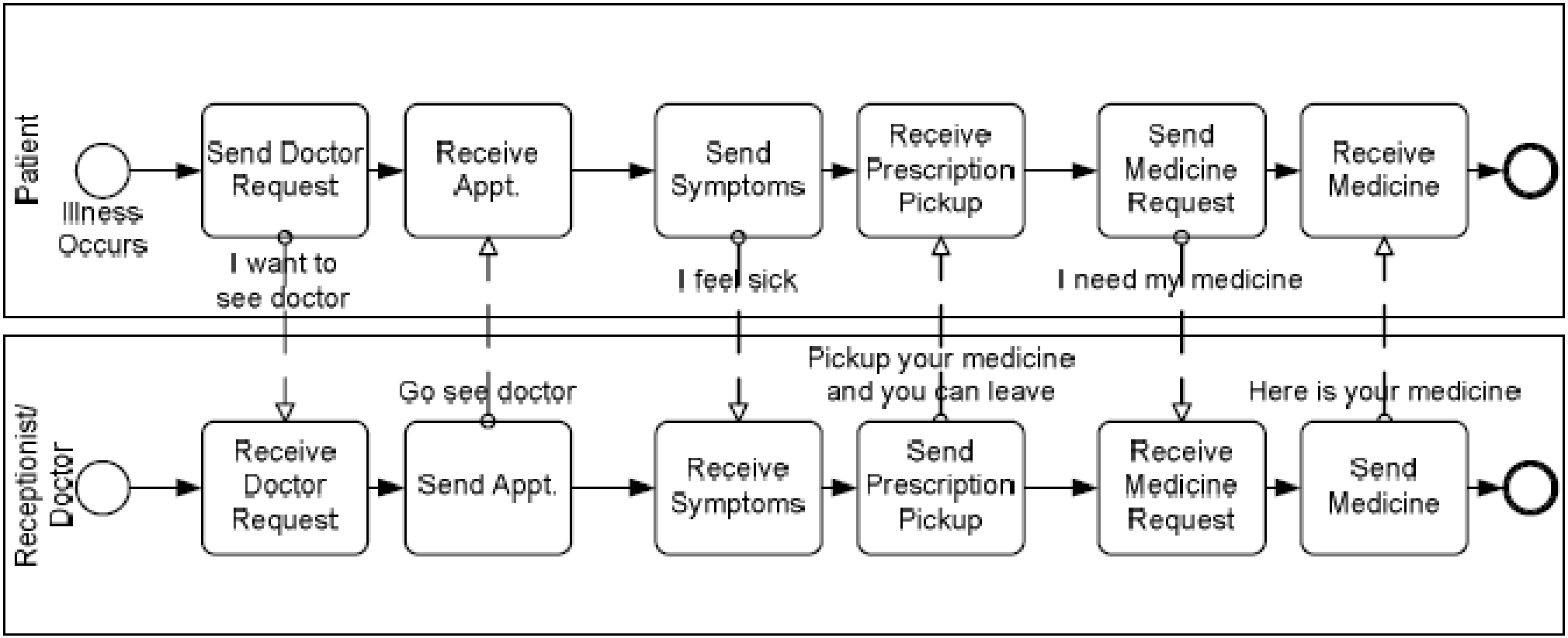
Visual Notation - Choreography

- Show the sequence of interactions between participants



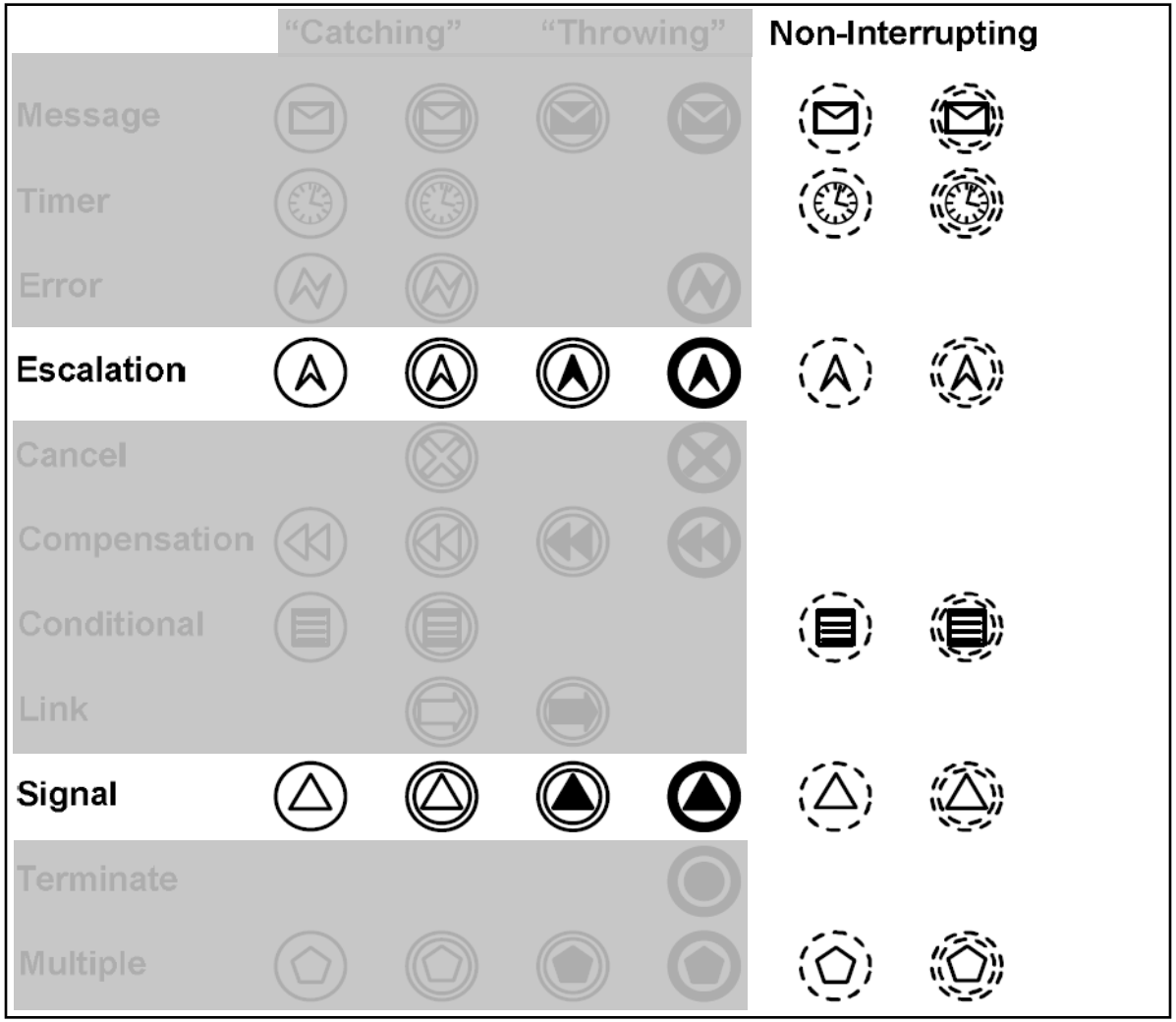
Visual Notation - Collaboration

- Conversations shown as a combined view of Process Orchestration and Choreography.



Event composition and correlation

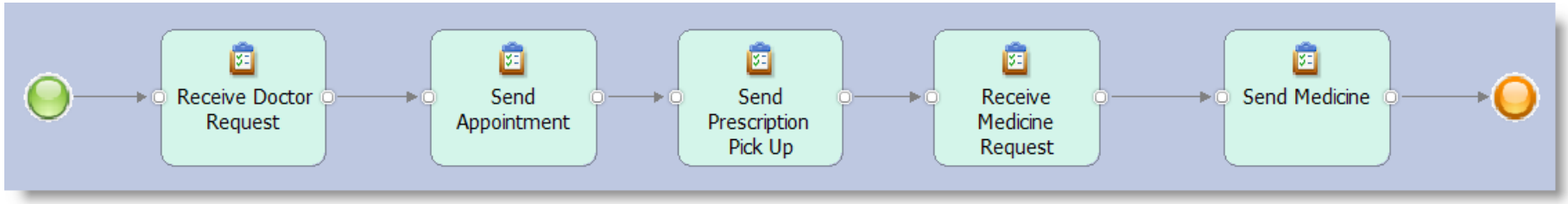
- New Event types
- New Event functions



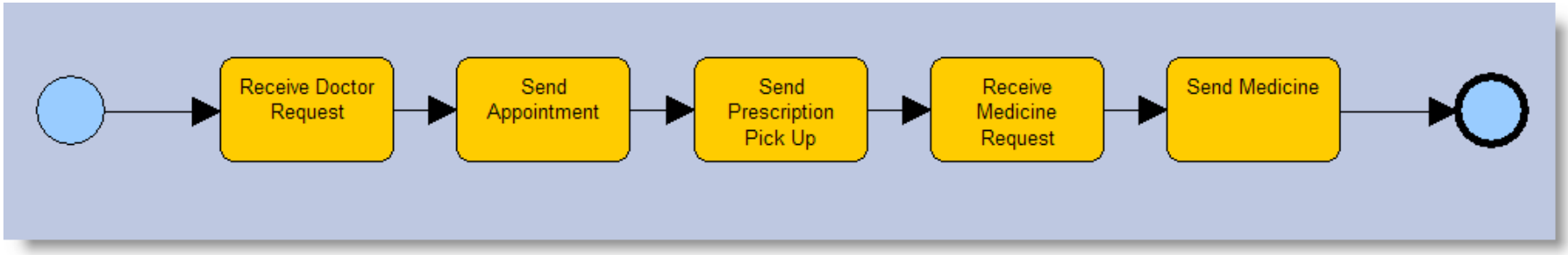
BPMN Interchange

- Provide an interchange format between different tools that supports exchange of BPMN models and diagram layout between different tools.

WebSphere Business Modeler



System Architect



BPMN execution

- Use BPMN XML schema to map to WS-BPEL with extensions as necessary

- Use other XML schema to import, e.g. System Architect to WebSphere Business Modeler using plugins; see *IBM alphaWorks* *http://www.alphaworks.ibm.com/tech/sabp4wbm* *for more information.*

BPMN Scope - reminder

- Visual notation and model for business processes
- Interchange format to exchange BPMN definitions and models
- Process Execution

Unhandled Business Concepts

- Constraints and guides
  - Organizational models and resources
  - Functional description and breakdowns
  - Data and information models
  - Business Motivation
    - Strategy
    - Goals and Objectives
    - Performance Indicators/Measurements
  - Business rules models
- Operational simulation
- Monitoring and deployment of business processes
- Deployment on non web service-based XML execution languages.

Handling Unhandled Business Concepts

- Use extensions and link them into elements from the set of core BPMN elements
  - Organizational models and resources
  - Business rules models
  - Data and information models
  - Performance Indicators/Measurements

Handling Unhandled Business Concepts

- Constraints and guides incompatible with set of core BPMN Elements
  - Requirements
    - Operational
    - Performance
  - Functional description and breakdowns
  - Business Motivation
    - Strategy
    - Goals and Objectives…
- **Conclusion**
  - Need more than just process models for development and implementation of business systems
- Enterprise Architecture
- Tools Interoperability and Governance

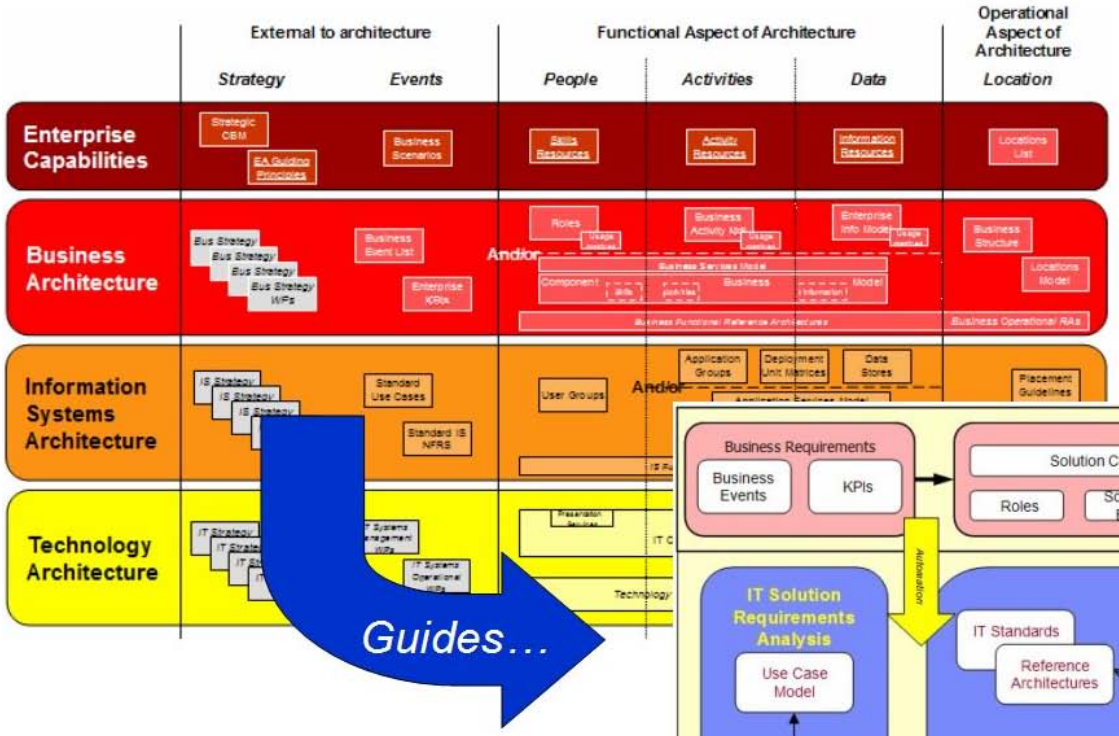
Enterprise Architecture and Business Process Management

- Business Process Modeling is a subset of Business Process Management (BPM)
- Enterprise Architecture (EA) and BPM are synergistic techniques used to drive improvement
  - EA primary focus on enterprise planning aspects of potential improvements
  - BPM primary focusing on solution delivery of operational improvement
  - EA and BPM together drive improvement in an integrated fashion across the planning and delivery cycles.
    - Enterprise Architecture = continuous planning of improvement
    - Business Process Management = continuous execution of improvement across business, IT and technology)

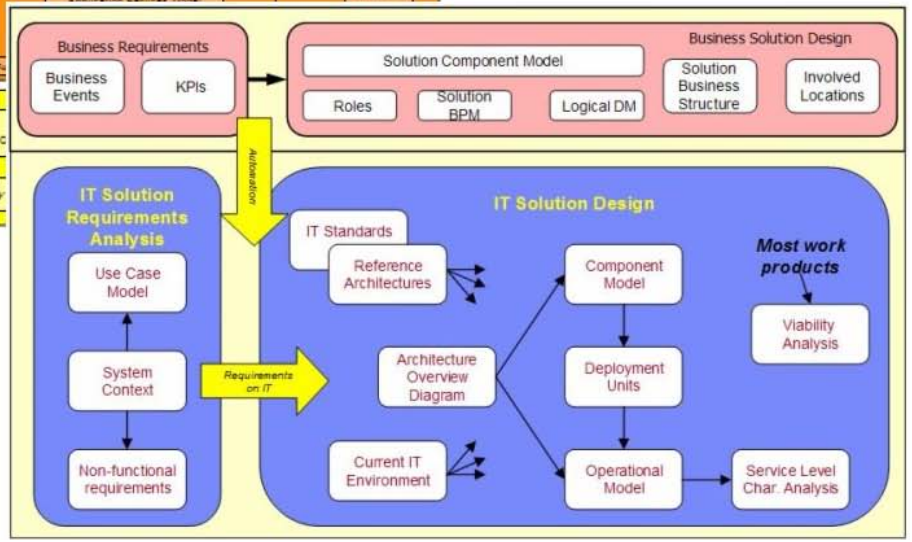
Enterprise Architecture, BPM, and Tools Interoperability

- **Must support <u>two styles of Architect behaviour</u>**
  - Architects – Those who take a holistic, system wide approach, wanting to define, explore, adjust and analyse “the system” from all points of view
    - ***“I need something of everything”***
  - Designers – focus specialised architecture skills on a specific aspect or part
    - ***“I need everything of something”***
    - Have a detailed, specialised focus on some aspect of the system,
      - requirements,
      - functional structure,
      - operational deployment etc.
- **Must <u>support two sorts of content</u>, for BOTH styles of behaviour**
  - Patterns, principles and building blocks that guide/constrain models
  - Models, describing the requirements on, and design of a target system

In other words, there is one set of Architecture Work Products (aka views of a system from various viewpoints)…

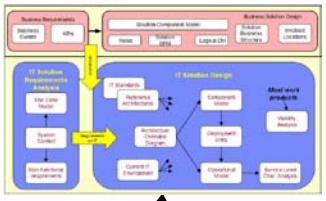
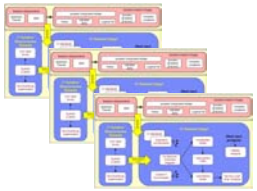
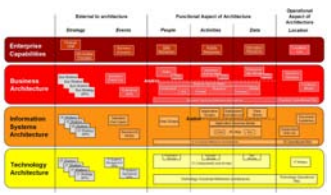
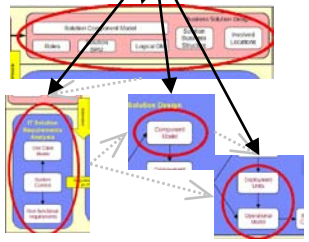
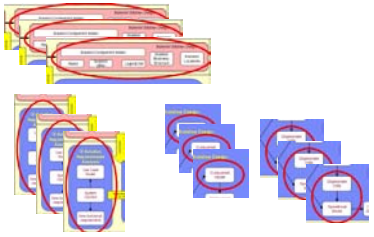
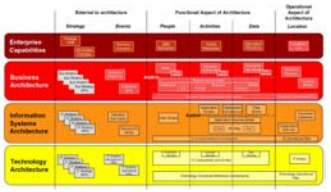


Enterprise Architecture's framework (of ABBs)



Solution Design's framework (of models)

One set of Architecture Work Products used in a variety of ways and with differing foci across the Architect community

	System Models	Architectural Patterns	Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
Design, Construction & Configuration, Test, Deployment, etc…	*Views and viewpoints associated with detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations	

We can describe these in different ways, depending on what things are…

	System Models		Guidance on Building Blocks & their usage	
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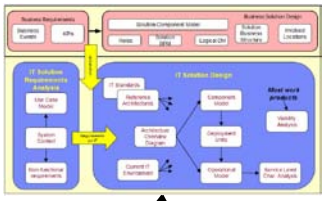
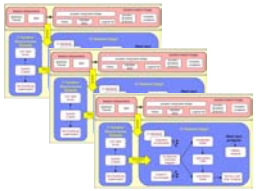
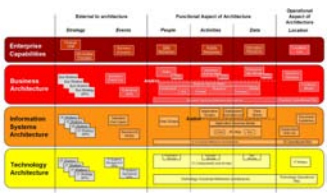
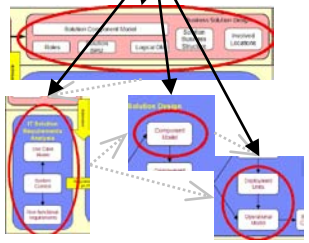
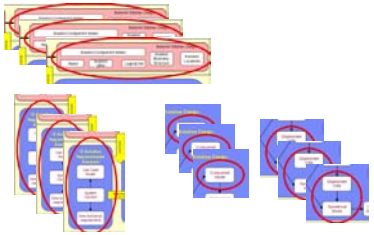
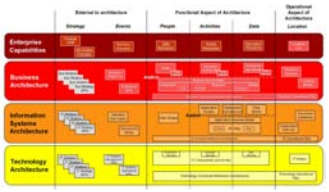
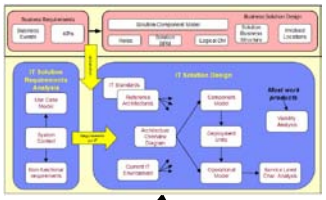
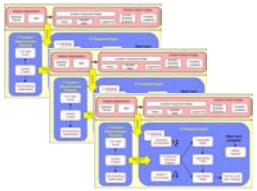
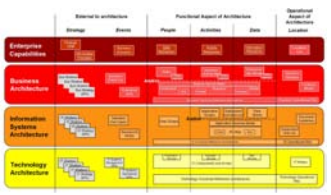
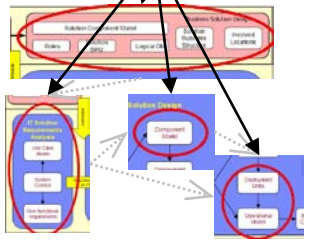
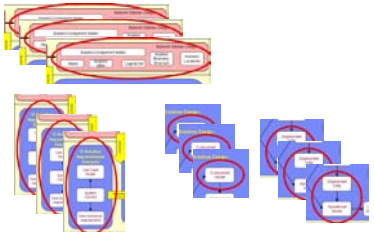
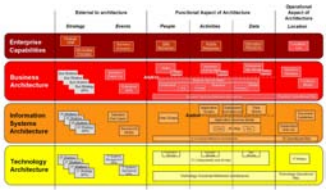
Holistic Architectural Thinking (“*something of everything*”)				
Architects				
Specialised Architectural Thinking (“*everything of something*”)				
Specialists Design, Construction & Configuration, Test, Deployment, etc…	*Views and viewpoints associated with detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations	

… and the way in which they are used (or work)

	"Design" System Models	Architectural Patterns	"Architecture" Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
Generalist Architects Holistic Architectural Thinking ("*something of everything*")				
Specialised Architectural Thinking ("*everything of something*") **Specialised Architects & Specialists** Design, Construction & Configuration, Test, Deployment, etc…				
	Views and viewpoints associated with detailing architecture BBs and their construction/configuration etc *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations	

Map our tools to this landscape in a way which reflects the working style of Architects

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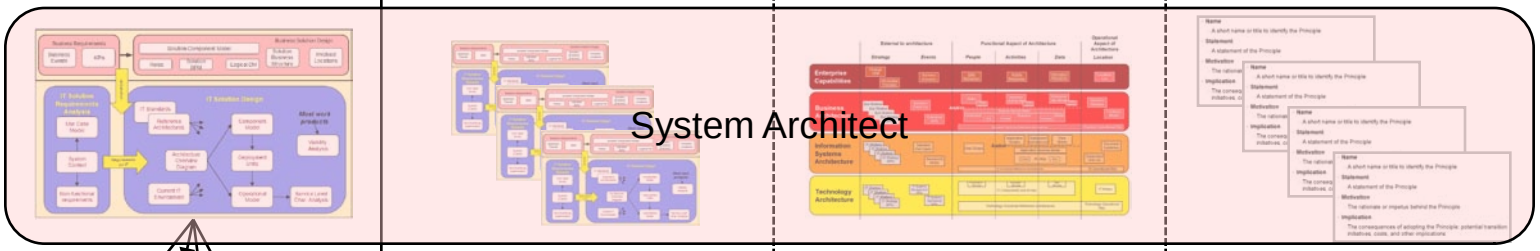
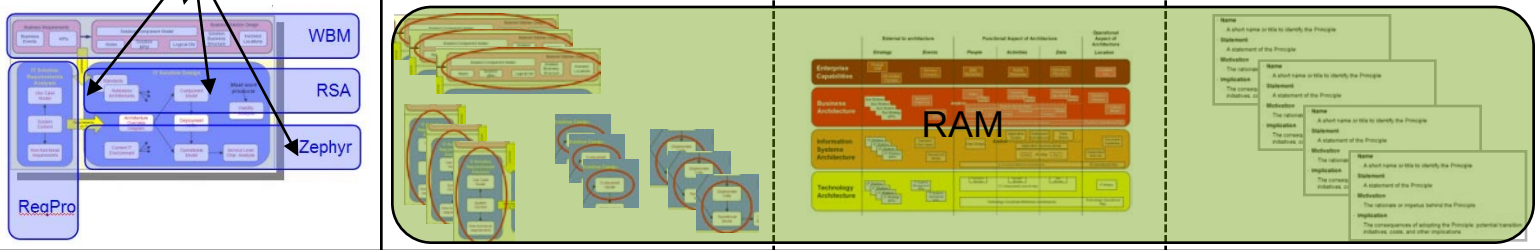
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
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.., well as recognising the need to connect “downstream”

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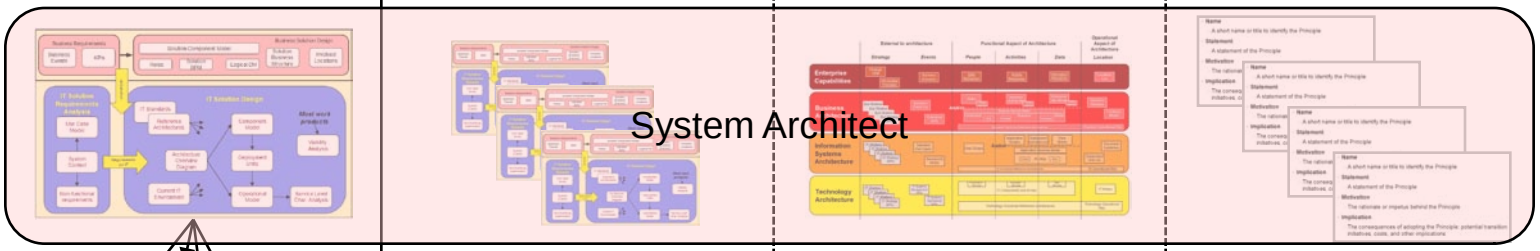
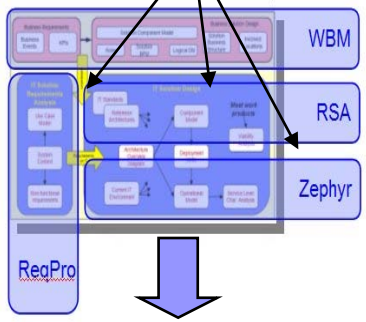
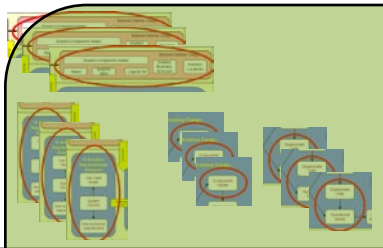
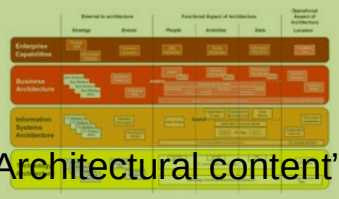
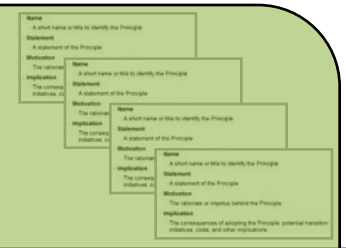
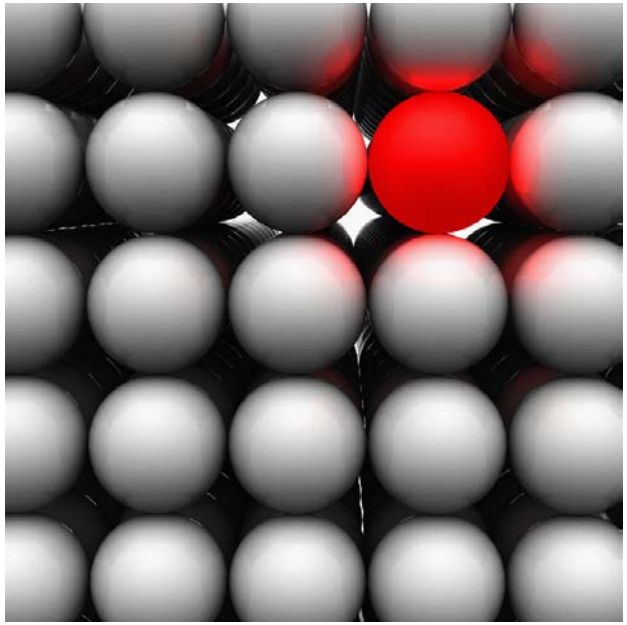
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations	

Tools Interoperability

- Tool interoperability NOT necessarily a sharing of artifacts for the purpose of asset reusability
- Need not involve a technical integration
  - Definitions as text
  - IBM Rational Asset Manager
  - Spreadsheets for cross reference
  - URLs
- Technical integration helps
  - Scalable
  - Manages complexity
  - Automation reduces administration burden
  - Reduces opportunities for introduction of errors
  - Separates lines of interest
    - I want to publish
    - I want to see where assets are being used



Tools Interoperability

- Is more than just a technical integration
  - Governance that sets out what are the patterns of collaboration for evolving and exchanging models; who has ownership, who uses what, why, and when.
  - Requires Model and Asset management; where and how to store models

Tools Interoperability Characteristics

- Define business constraints
  - Maybe process orientated or non process orientated
- Model Exchange
  - Bidirectional Collaboration/communication relationships
    - Publish
    - Seeding
    - Feedback
    - Harvesting
    - Change of ownership - an asset is owned by one and only one of the tools at a time
- Visibility and tracing
  - ability to make uni/bi directional reference to content across tools
  - ability to see content across tools
  - Search across integration
- Model and Asset Storage

Model Management

- Model use
  - Define what model, for which audience, and reasons why
  - Frameworks for use with dimensions that organize and categorize models
- Model sharing and collaboration
  - Collaboration styles
  - Exchange Patterns
  - Model consistency management across abstraction levels and domains
- Asset Management
  - Sharing and managing of models as assets

Model Management

- A successful model management solution requires:
  - Consistency in how the various tools support the various model artifacts
    - Use of standards, e.g. BPMN2.0
    - Use of frameworks
  - Consistency in how those tools support team modeling, asset management and model consistency management
  - Well-documented best practices
  - Consistent lifecycles across domains and levels

Patterns for Evolving and Exchanging Models

- There are 3 basic patterns for evolving and exchanging models
  - Synchronous Sharing
    - Used for direct collaboration
  - Constraint & Feedback
    - Used for the “touch points” between essentially different but correlated sets of models

    Seed, Harvest, Propagate
    - Used for controlled branching of changes on one set of models

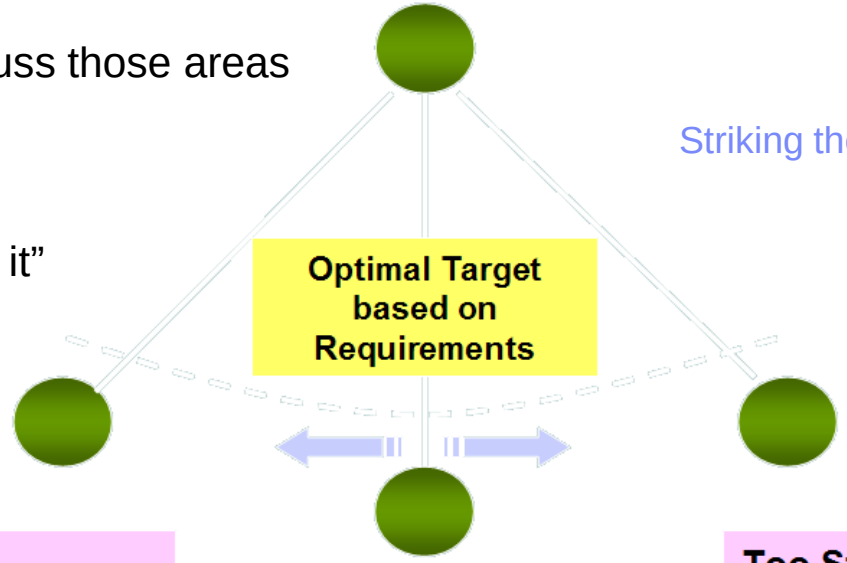
- Governance and change management
  - Governing use of and changes to models
  - Handling of model change request lifecycles (including the constraint & feedback cycle)

Governance and Change Management

Command and Control

- "Do what I say, and I will ensure that you do"

- **Guide and Govern**
  - "Use the architecture, and we'll discuss those areas where it does not make sense"
- **Publish and Trust**
  - "I know you will do your best - go do it"



Evolving and Excha…ample…

2

6a

The ABBs featuring in these specialist architect models (ie for each viewpoint) may have been found in the Enterprise Architecture

(example = Component ABBs)

3

A Business Analyst (or Application Architect) develops a deeper, more accurate definition of the IT part of the solution's requirements…

And an Infrastructure Architect better operational model

5

…as well as patterns appropriate to the level of detail required (e.g. "web services" Component Model, Level 6)

6b

System Mode…

…of ABBs …Catalogues)

Principles & Guidelines, Estimating data Usage metrics

Specialised Architectural Thinking ("*everything of … something …*

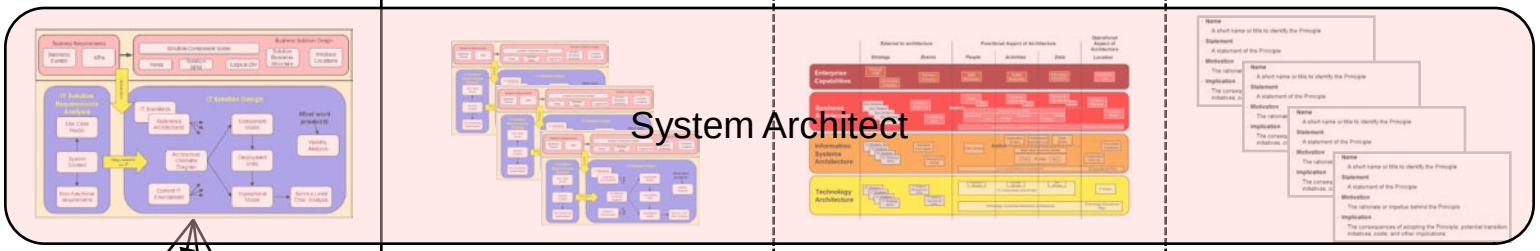
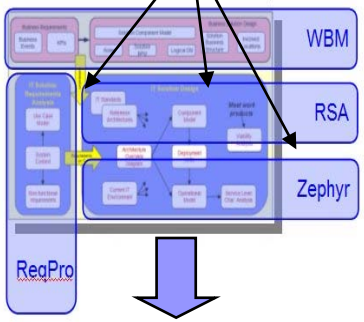
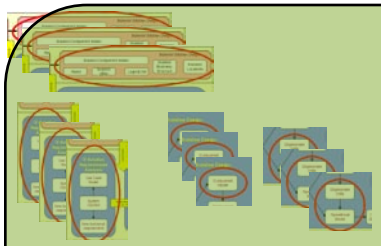
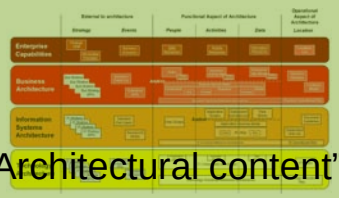
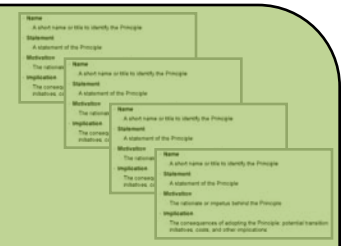
…ociated with … and their … etc

…d attributes …ldresses …gements

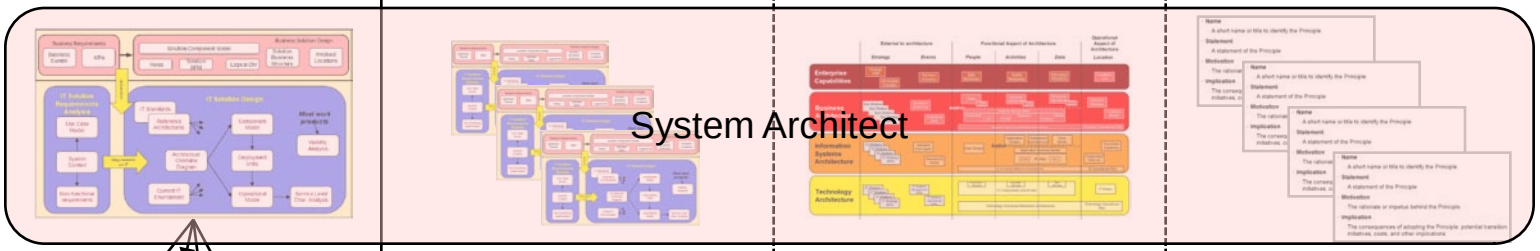
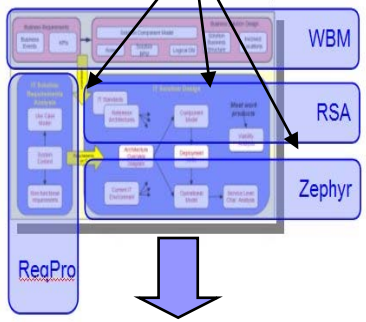
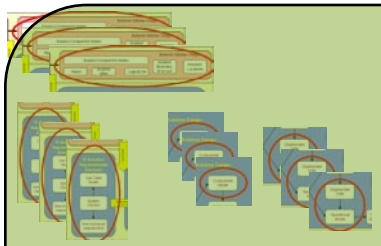
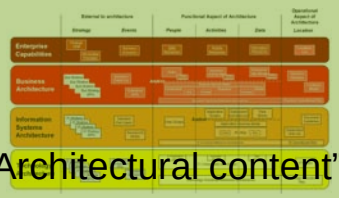
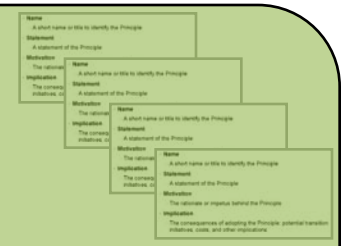
Detailed patterns…

Permitted
Package customisations
h/w configurations

To do this, our tools have to…

	System Models	Architectural Patterns	Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations	

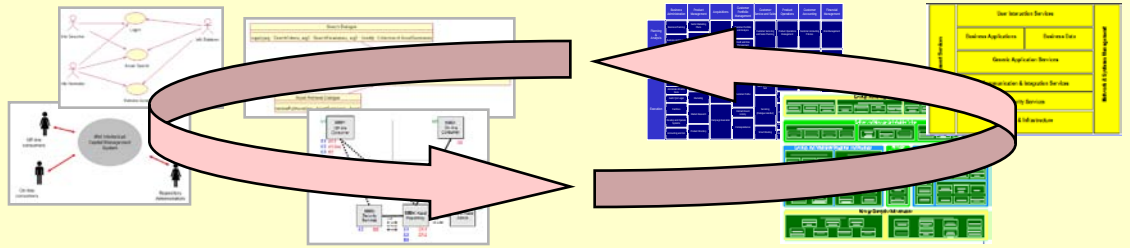
Work together but integration is not mandatory

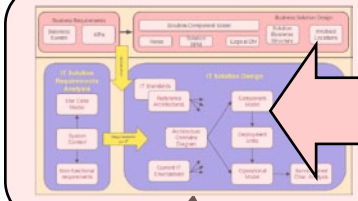
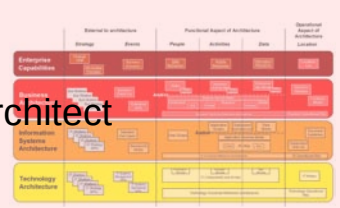
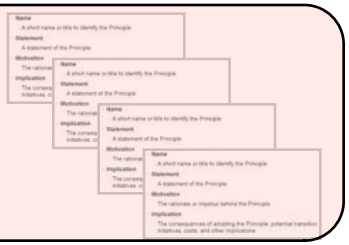
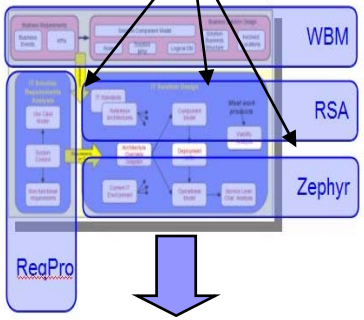
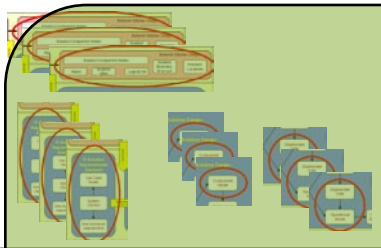
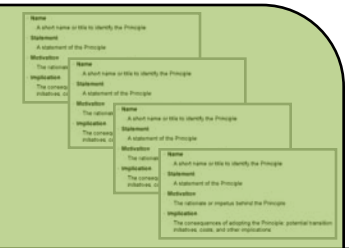
	System Models	Architectural Patterns	Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations	

Allow the holistic creation of High level models and ABBs

1

Support the integrated creation, management and use of system/model and ABB/catalogue views and viewpoints

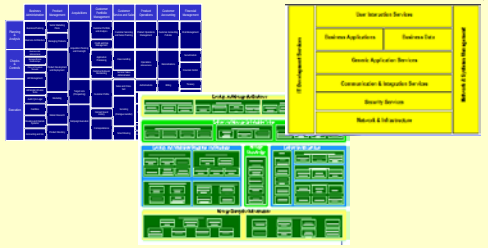


	System Models		Usage metrics
Holistic Architectural Thinking (“*something of everything*”)		System Architect	 
Specialised Architectural Thinking (“*everything of something*”)		 “Architectural content” RAM “D, C&C, T and D content”	
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations

Support the publication of patterns & ABBs

This would also include the structure, but no content of lower levels

Publication high level ABBs and patterns from SA into RAM

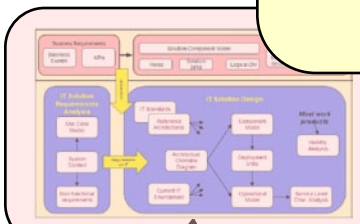


System M… 2

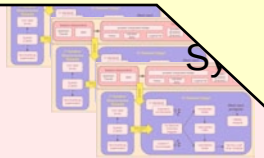
Sets of ABBs
(a.k.a ABB Catalogues)

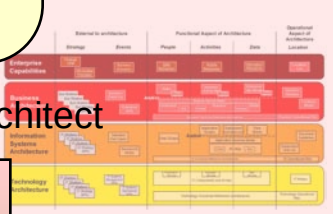
Principles & Guidelines,
Estimating data
Usage metrics

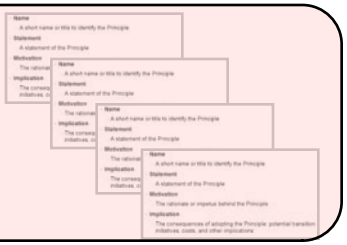
Holistic Architectural Thinking
(“*something of everything*”)



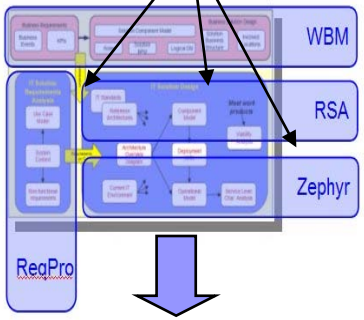
S… Architect

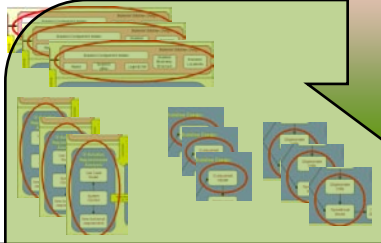






Specialised Architectural Thinking
(“*everything of something*”)

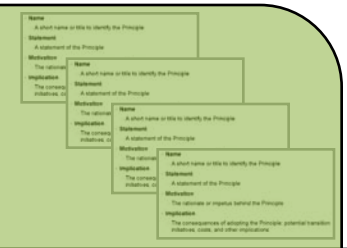




“Architectural content”

RAM

“D, C&C, T and D content”



Design, Construction & Configuration, Test, Deployment, etc…

detailing architecture BBs and their construction/configuration etc

Eg:
Compenent – methods and attributes
Node – disk layouts, IP addresses
Location – furniture arrangements

Detailed patterns…

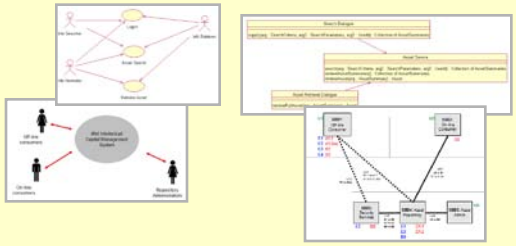
Permitted
Package customisations
h/w configurations

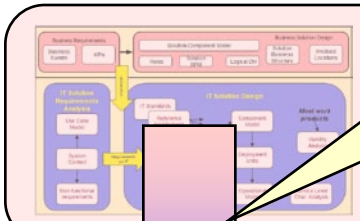
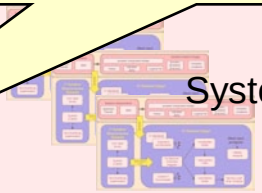
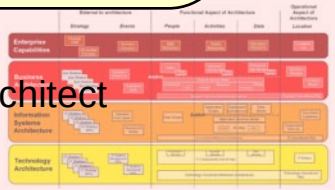
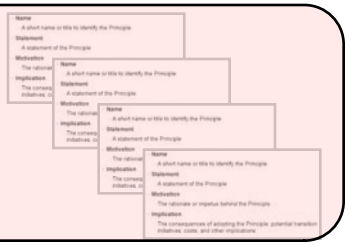
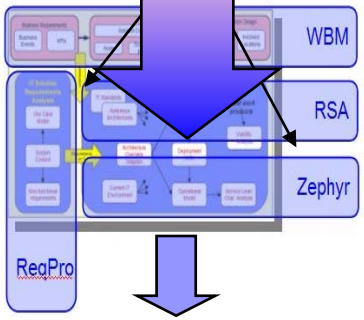
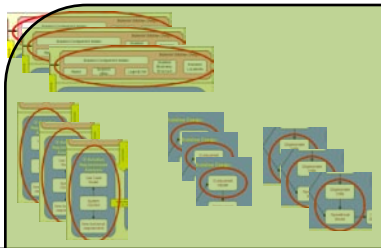
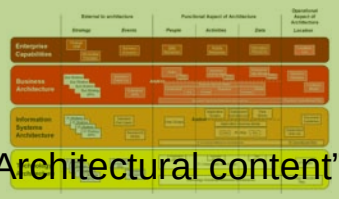
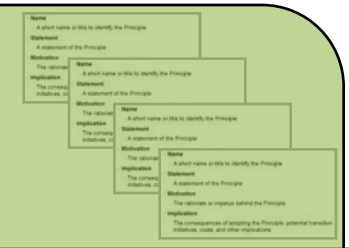
Support the transfer of high level models to specialist architects

Via RAM as an asset repository or direct integration

Publication of high level system models from SA to specialist Architect tools

3

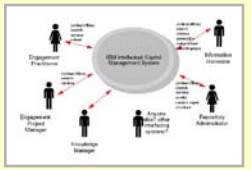


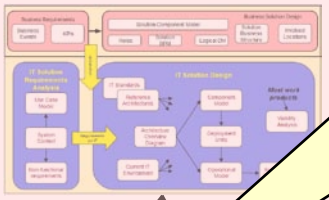
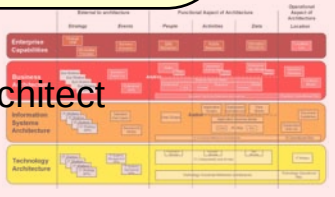
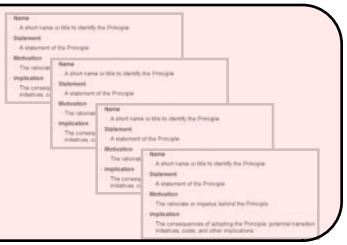
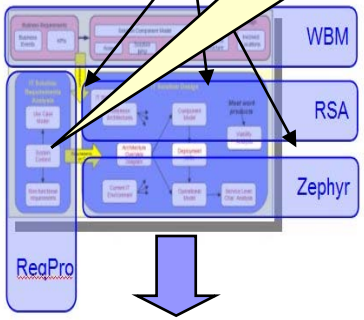
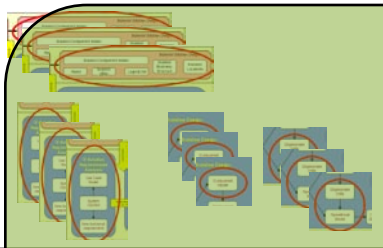
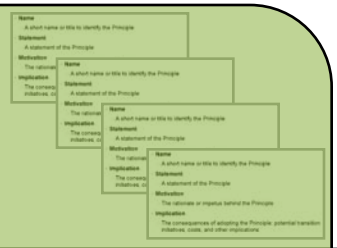
	System Models		Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)		System Architect  	
Specialised Architectural Thinking (“*everything of something*”)		 “Architectural content”  RAM “D, C&C, T and D content”	
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns… Permitted Package customisations h/w configurations	

Support specialist architects in detailing and sharing models

The use of these specialist architect tools to develop detailed models

4



	System Models	Bs ogues)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)	 System Architect		
Specialised Architectural Thinking (“*everything of something*”)		 “Architectural content” RAM “D, C&C, T and D content”	
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	Permitted Package customisations h/w configurations

Allow the harvesting, hardening & abstracting of system models into patterns and Building Blocks

The Harvesting of low level models (**including manual intervention**) for the identification of patterns and ABBs

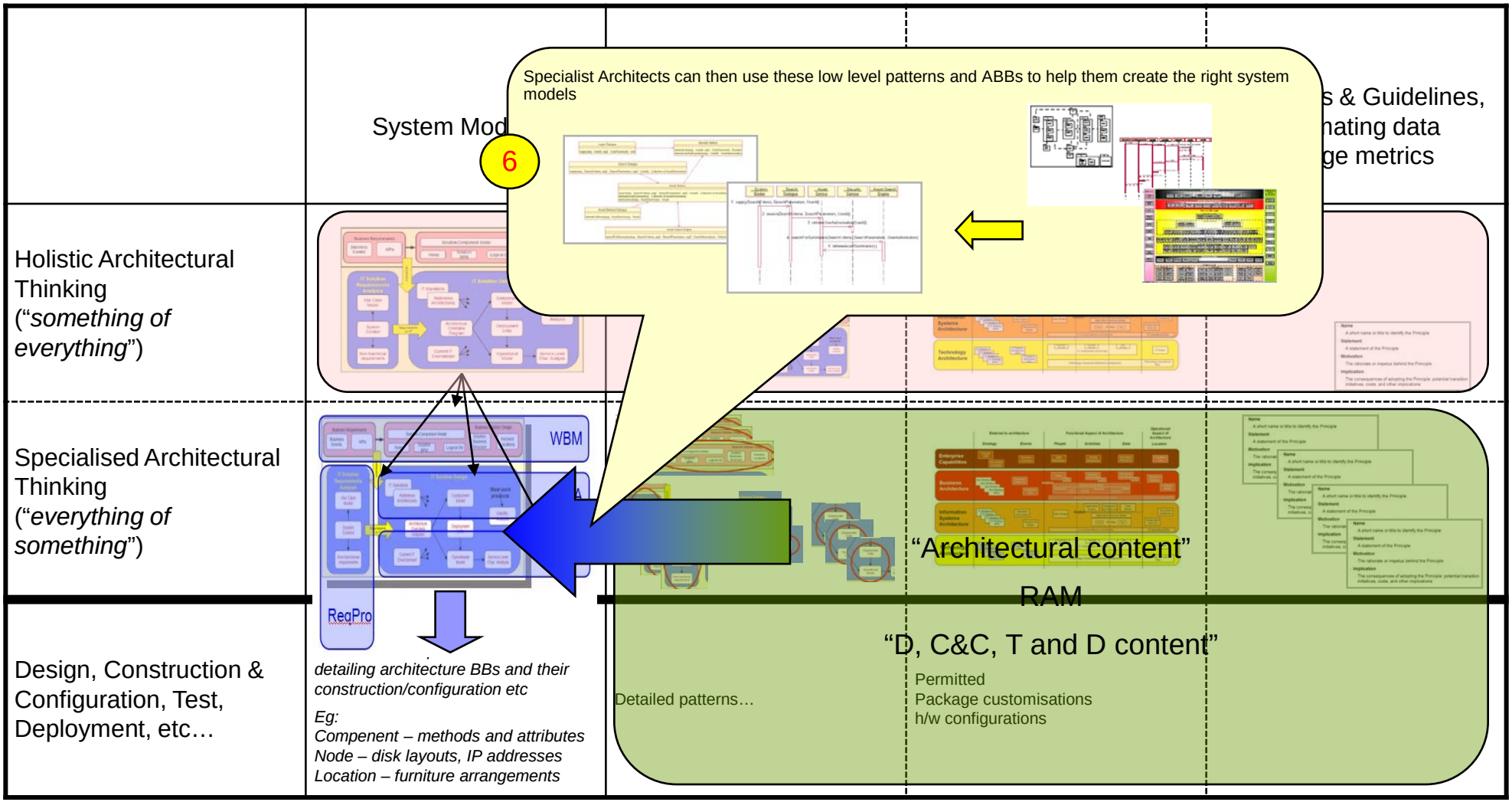
5

	System Models	Architectural Patterns	(ak
Holistic Architectural Thinking (“*something of everything*”)			
Specialised Architectural Thinking (“*everything of something*”)	WBM RSA Zephyr ReqPro		
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detailed patterns…	“D, C&C, T and D content” Permitted Package customisations h/w configurations

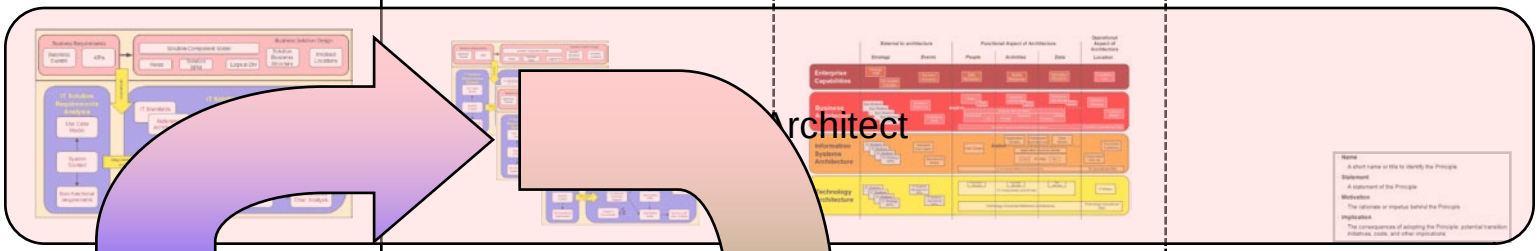
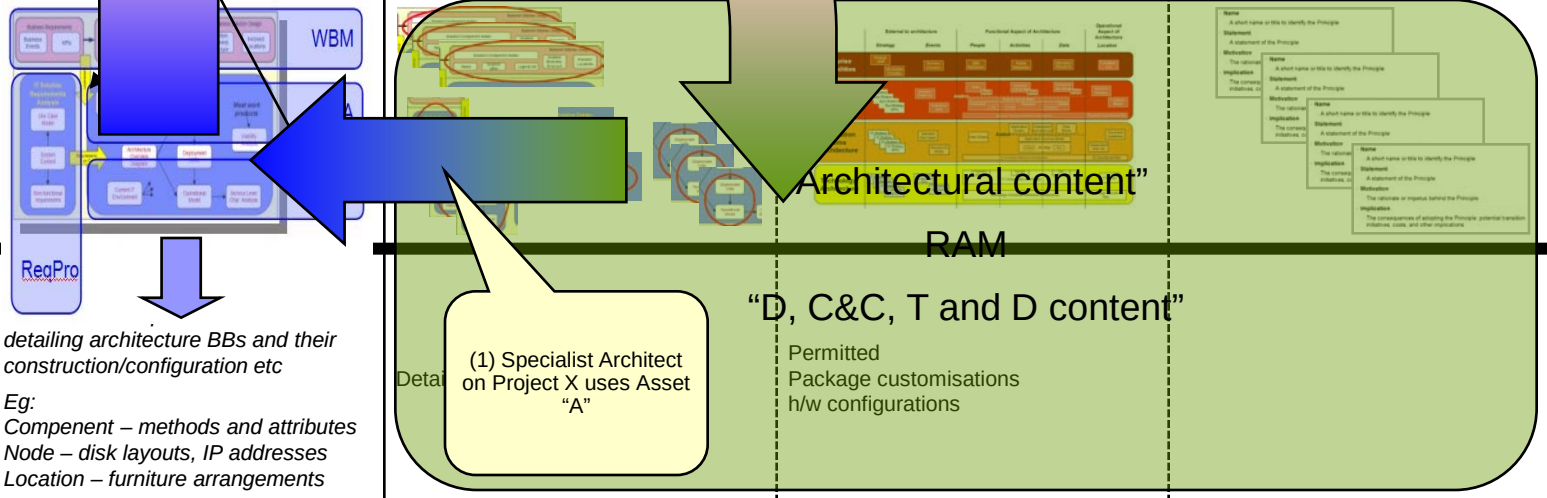
Architectural content”

RAM

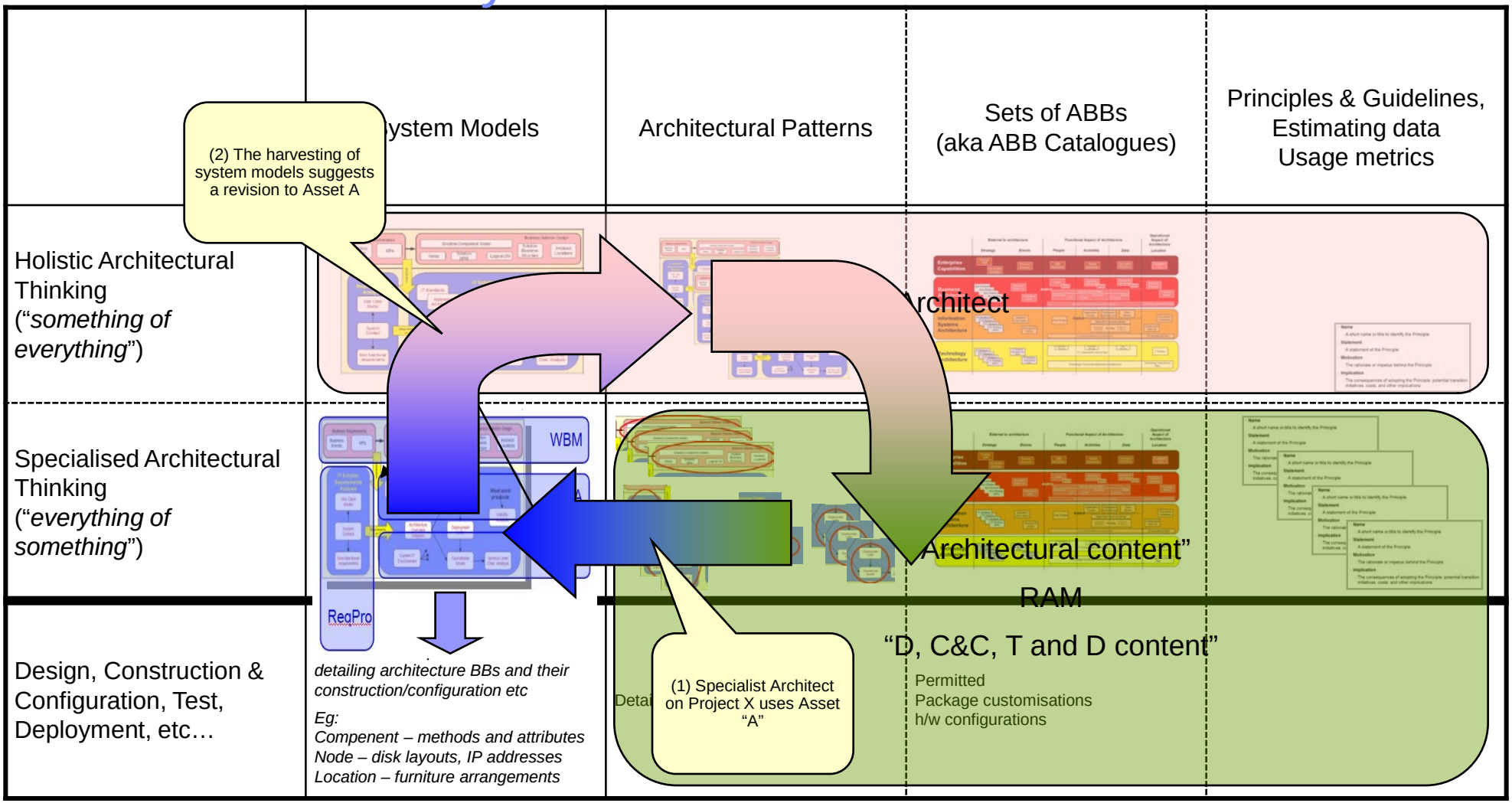
Allow the interrogation, and direct exploitation of low level assets by specialist architects



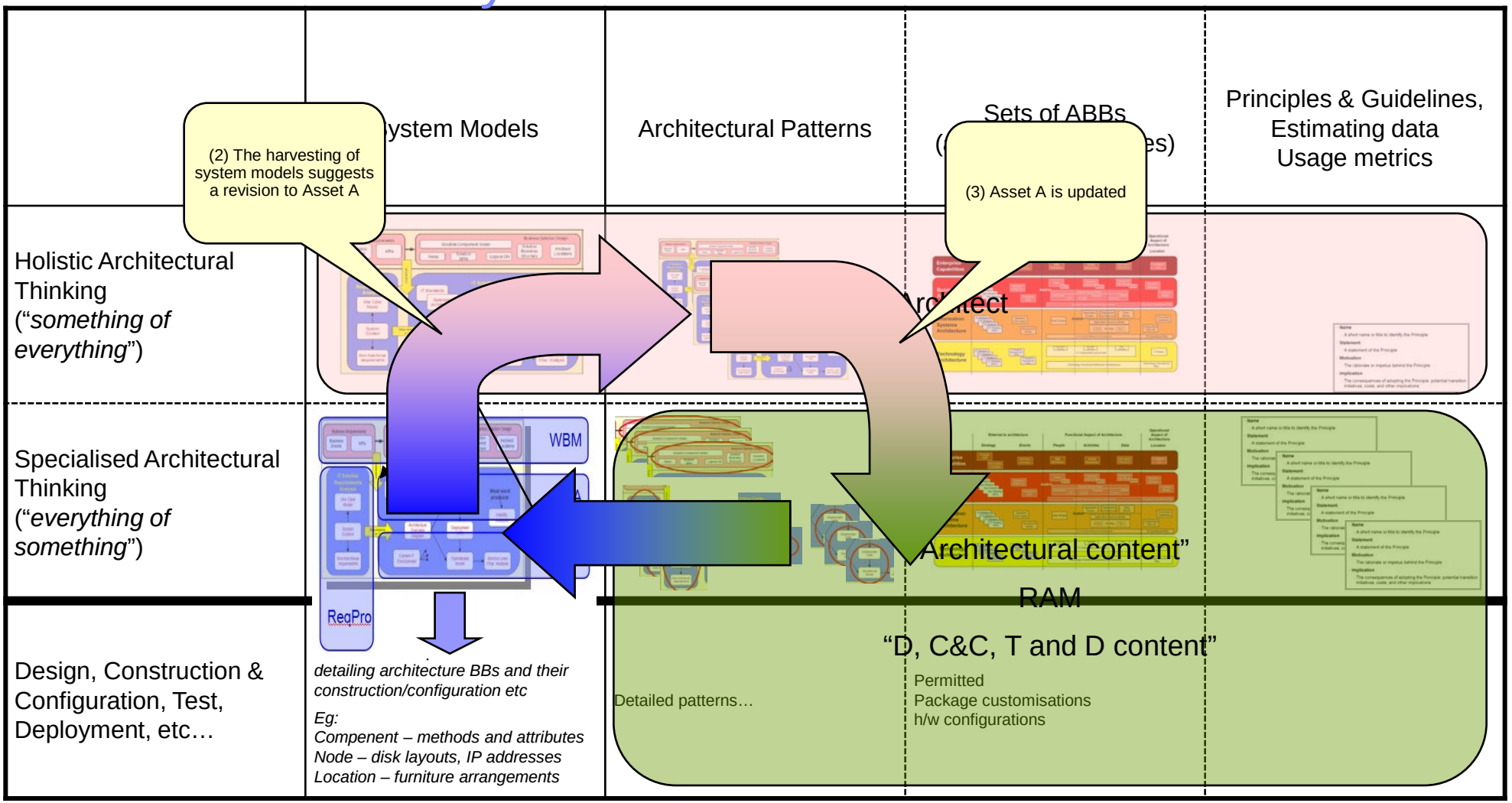
As well as the lifecycle of assets

	System Models	Architectural Patterns	Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*			

As well as the lifecycle of assets

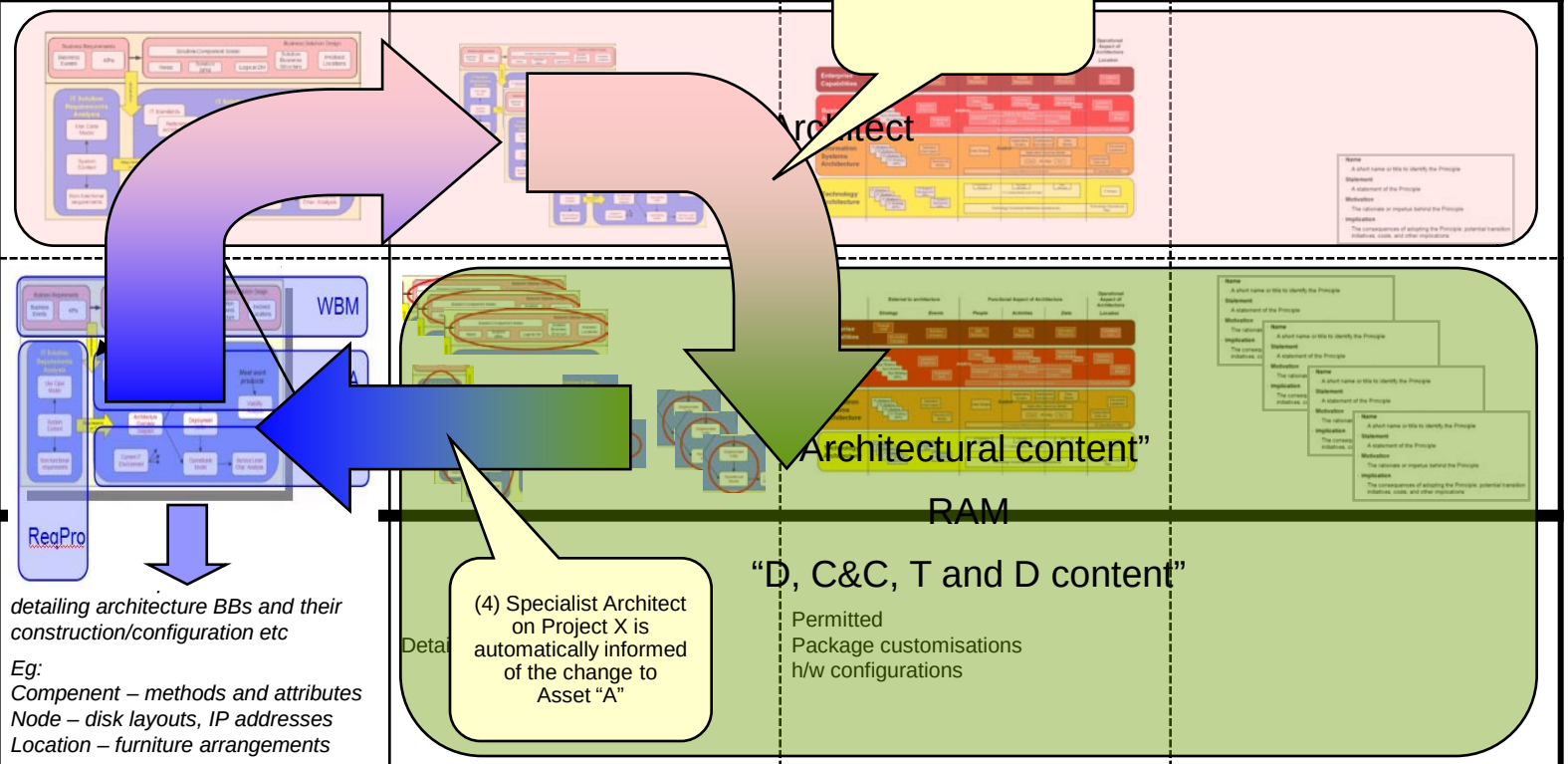


As well as the lifecycle of assets



As well as the lifecycle of assets

	System Models	Architectural Patterns	Sets of ABBs (…es)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
Design, Construction & Configuration, Test, Deployment, etc…	*detailing architecture BBs and their construction/configuration etc* *Eg:* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*			



As well as the lifecycle of assets

	System Models	Architectural Patterns	Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
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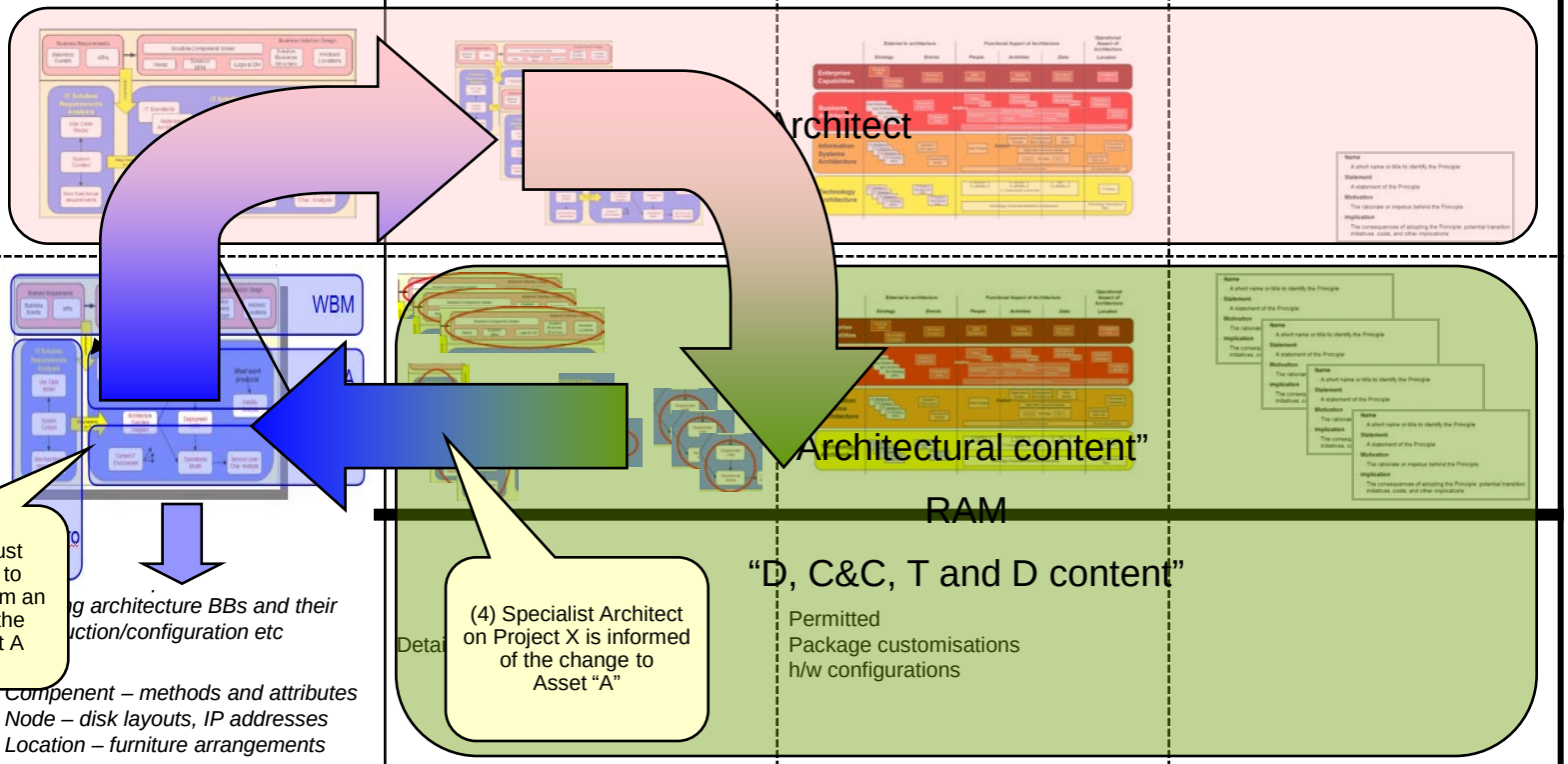
Specialised Architectural Thinking (“*everything of something*”)				
Design, Cons… Configuration… Deployment, et…	*…g architecture BBs and their …uction/configuration etc* *Compenent – methods and attributes* *Node – disk layouts, IP addresses* *Location – furniture arrangements*	Detai…	“D, C&C, T and D content” Permitted Package customisations h/w configurations	



In all of this, there is NO model ROUND TRIPPING

	System Models	Architectural Patterns	Sets of ABBs (aka ABB Catalogues)	Principles & Guidelines, Estimating data Usage metrics
Holistic Architectural Thinking (“*something of everything*”)				
Specialised Architectural Thinking (“*everything of something*”)				
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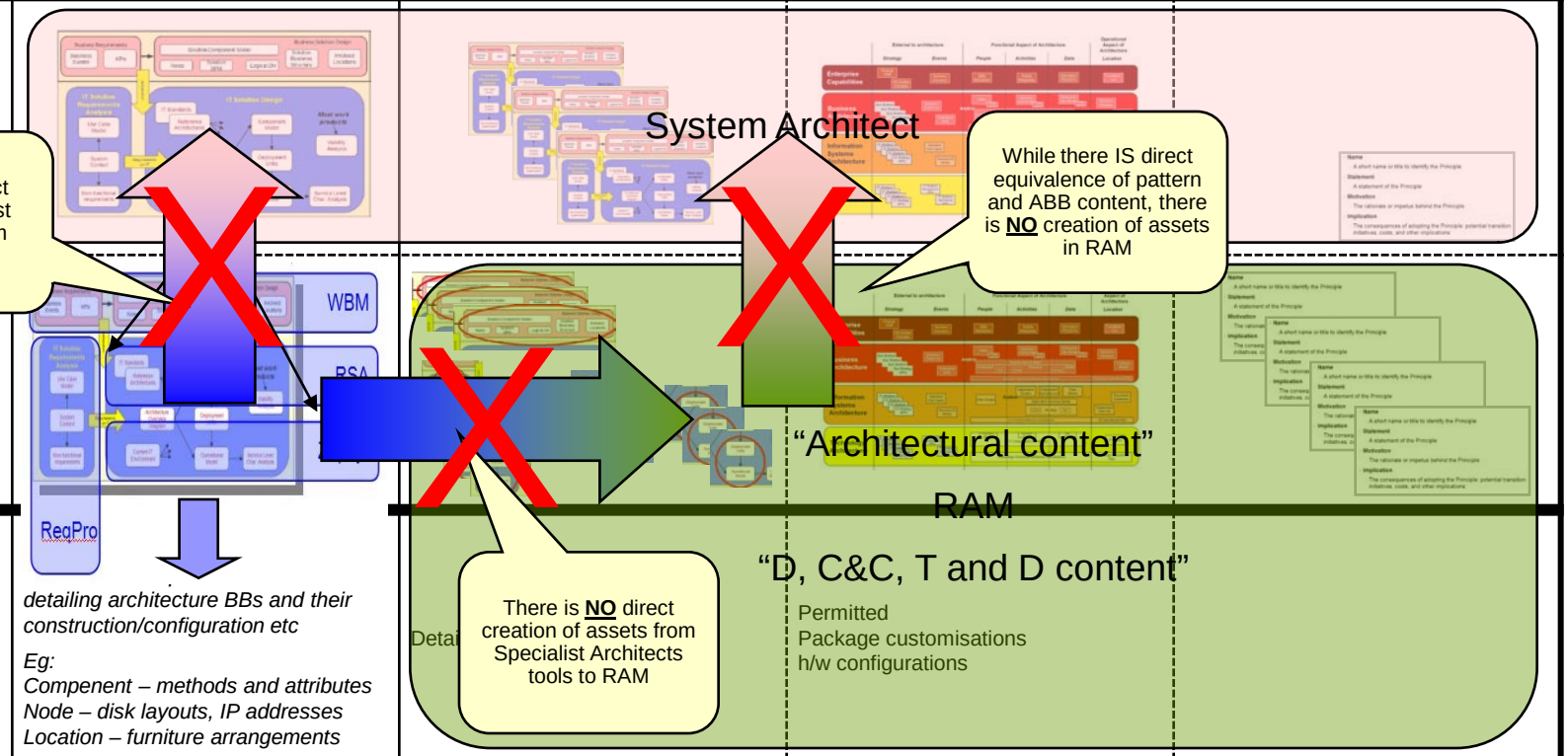
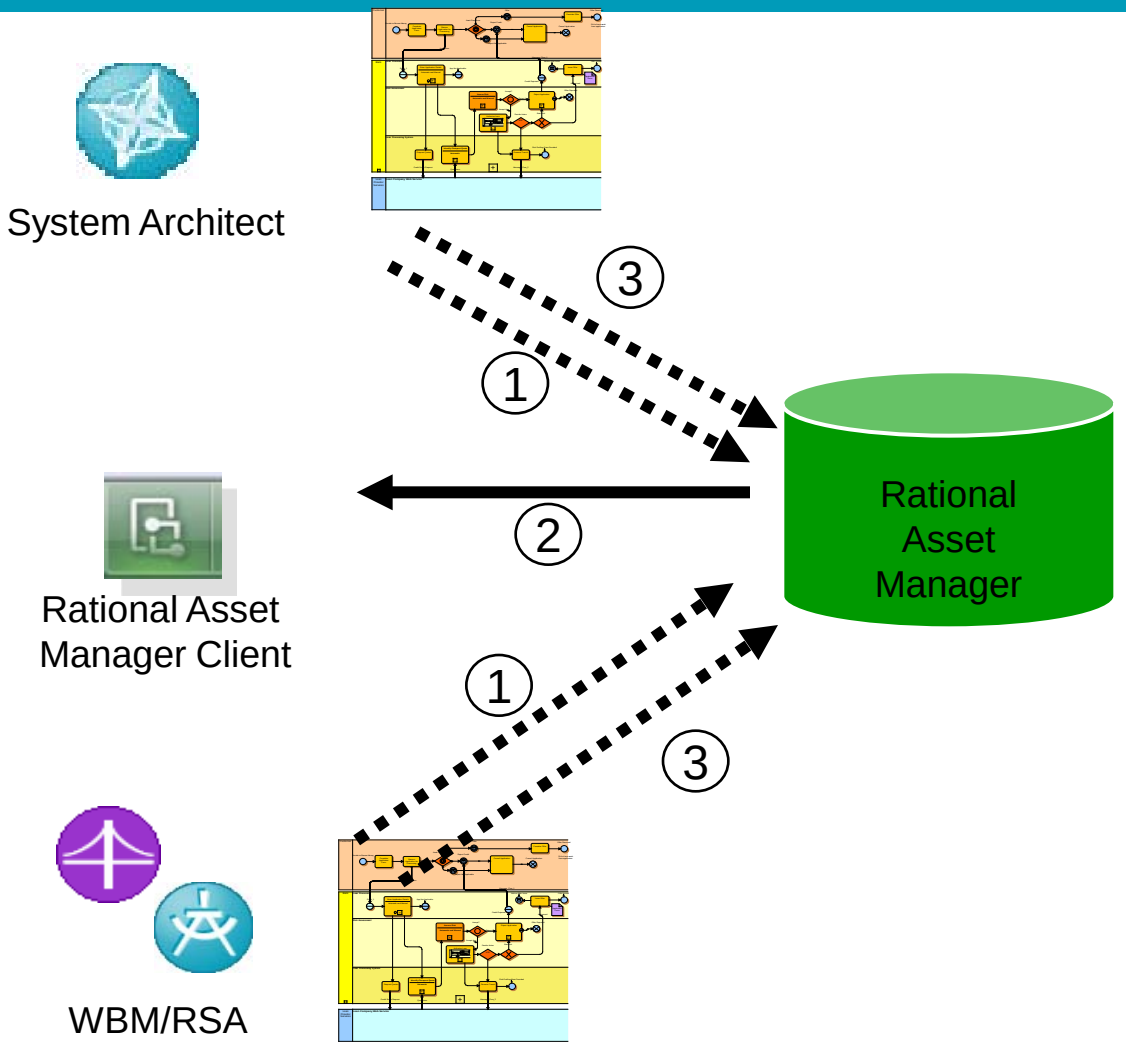


Exemplar

1. Asset changes in RAM
(From SD or EA)

2. Subscribed users are informed of asset update

3. Solution Delivery projects must either conform to or raise an exception to the asset modification



Synchronous Sharing
Example scenario for Enterprise Architecture Asset Collaboration

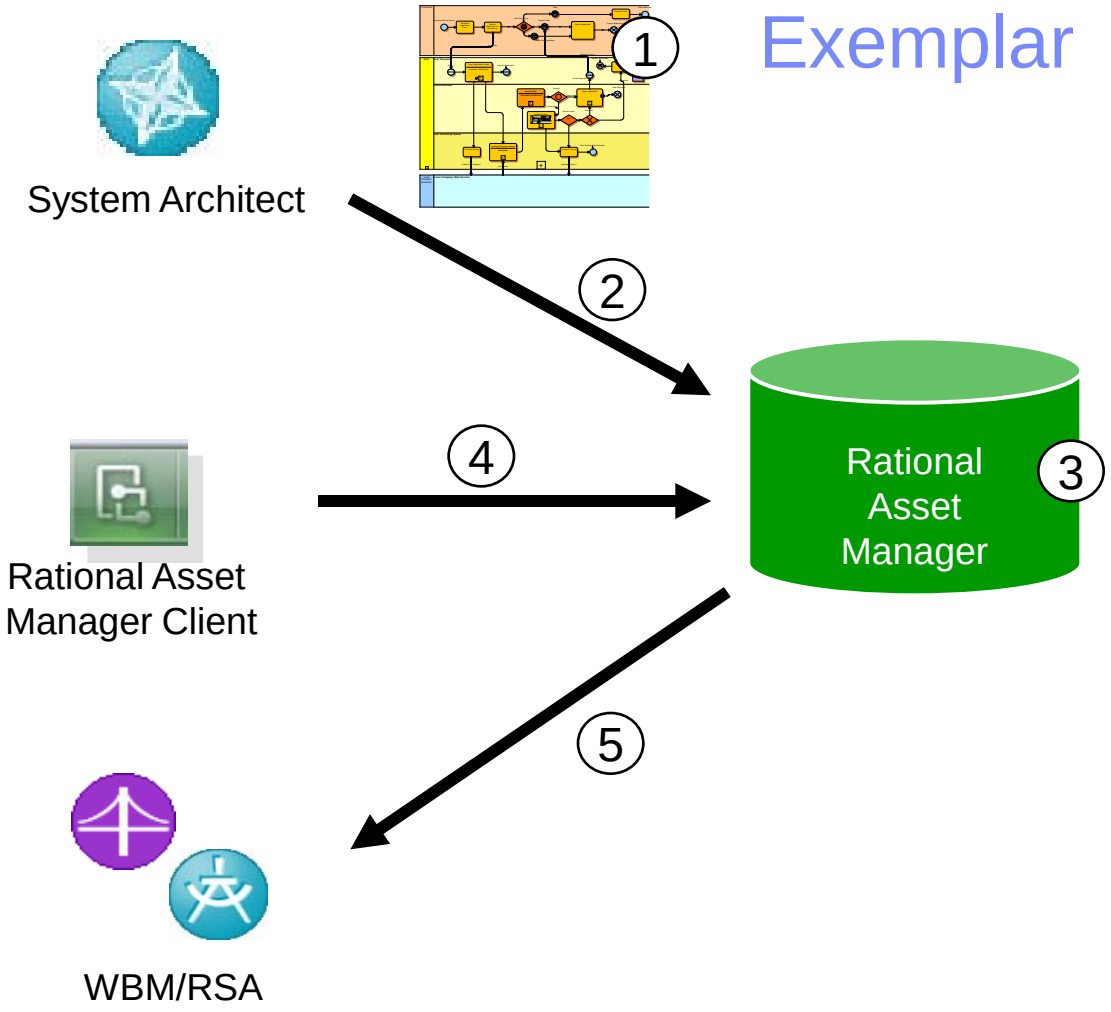
1. Enterprise Architect creates models and definitions in System Architect or SA XT or SA Process Integrator

2. Architect decides to publish content as a EA Re-usable asset

3. SA XML, HTML Model and Tagged description of model is stored in RAM

4. Software Architect searches RAM for Re-usable EA asset (or is informed if subscribed to asset)

5. Software Architect may see the model (in HTML) and asset is transformed by Solution Delivery Tool



Example scenario for Enterprise Architecture Model Re-use

1. Software Architect creates models and definitions in RSA, WBM or other SD tool

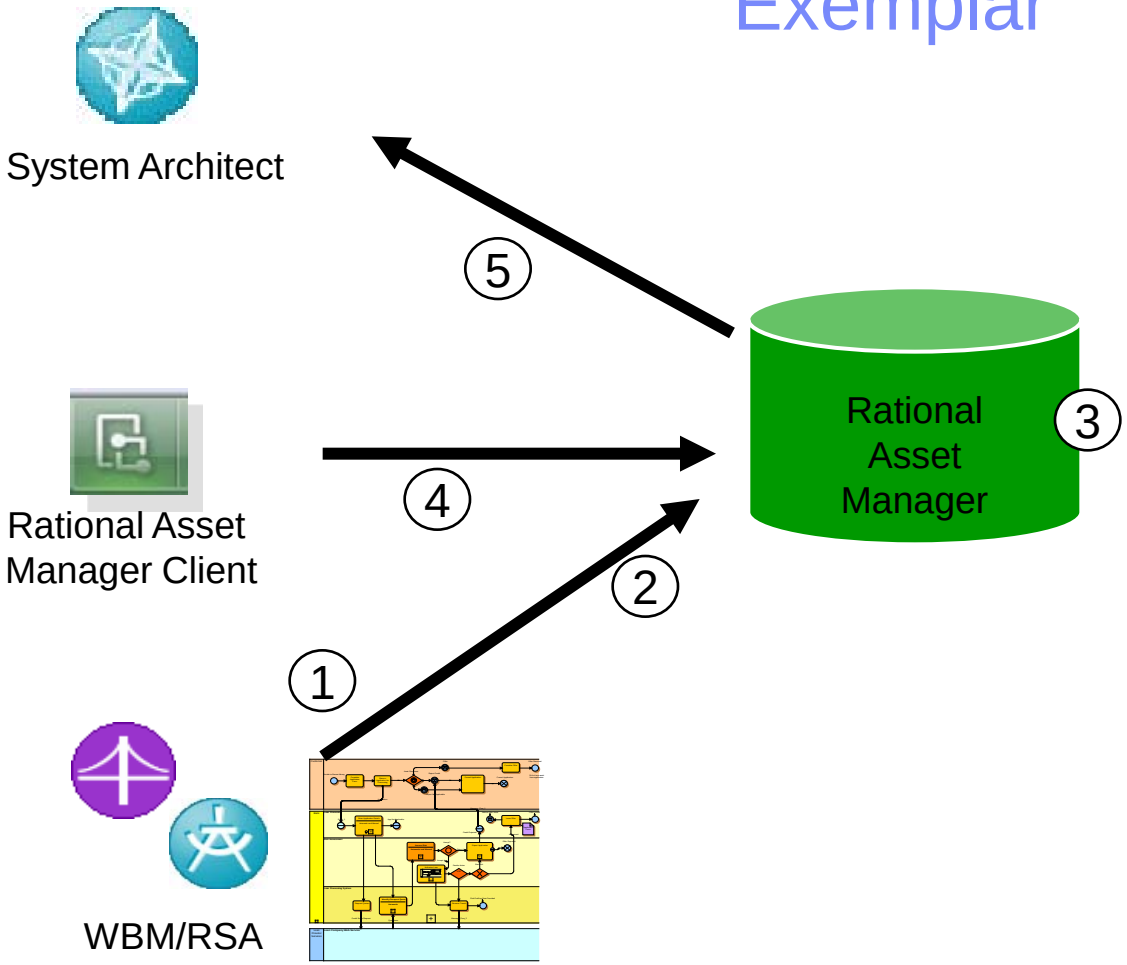
2. Architect decides to publish content as a EA Re-usable asset

3. SD Tool XML, HTML Model and Tagged description of model is exported to RAM

4. Enterprise Architect searches RAM for Re-usable EA asset (or is informed if subscribed to asset)

5. Enterprise Architect may see the pattern (in HTML), reference it via URI and/or transform it

Exemplar



Harvest or Feedback
Example scenario for Enterprise Architecture Pattern Governance

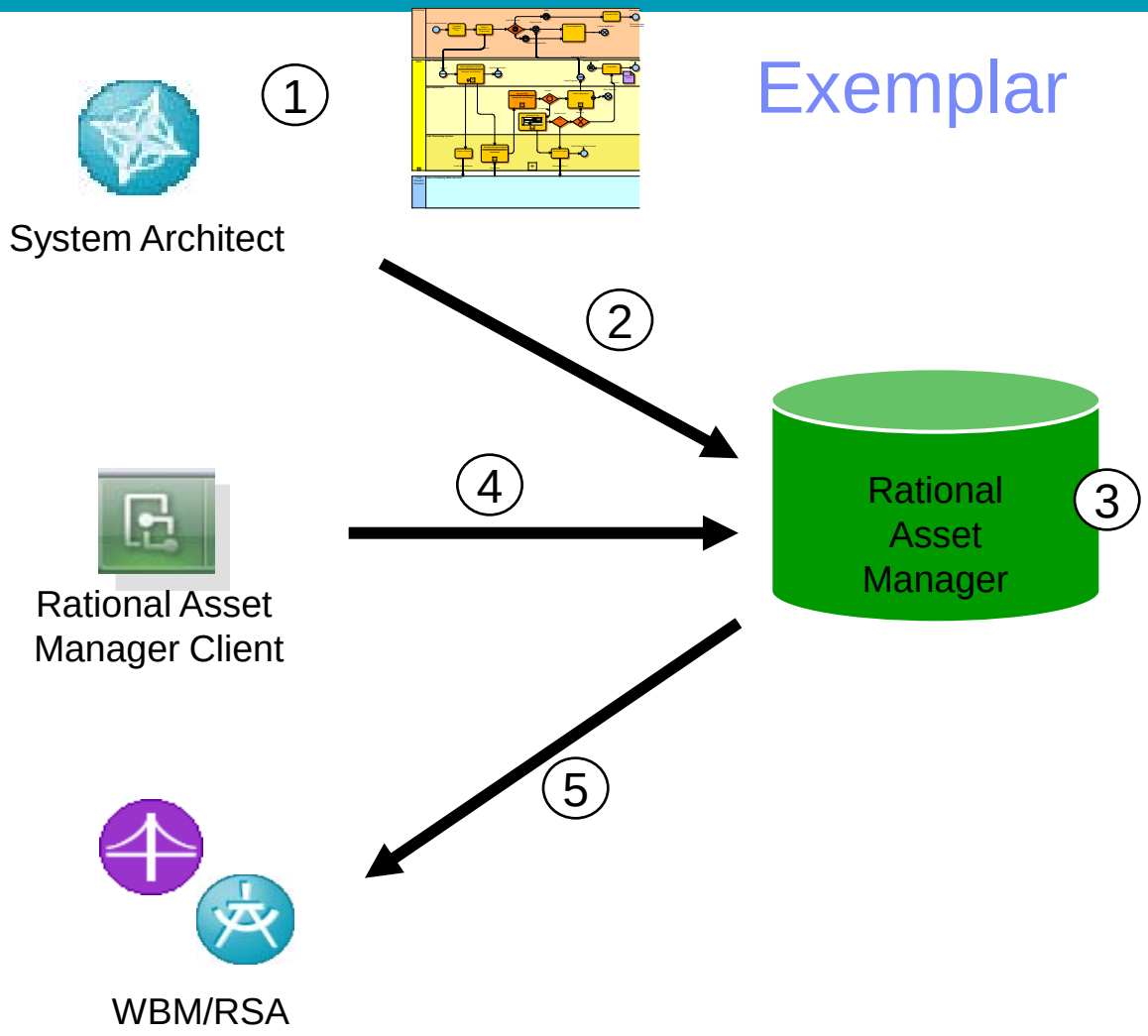
1. Enterprise Architect creates models and definitions as patterns in System Architect or SA XT

2. Architect decides to publish content as a EA Pattern to RAM

3. SA XML, HTML Model and Tagged description of model is exported to RAM (with identifier as Pattern)

4. Software Architect searches RAM for EA Pattern (or is informed if subscribed to pattern)

5. Software Architect may see the pattern (in HTML) and may reference it via URI in Solution Delivery tool



Seed or Constraint
Example scenario for Enterprise Architecture Pattern Governance

Example for Model Evolution and Exchange Patterns using WBM

- Synchronous Sharing 
  - Process Analysts working on the TO-BE process portfolio in WBM
- Seed & Harvest 
  - Establishing a project that works on service models in an RSA branch
  - Seeding RSA with a WBM model whose IT support needs to be realized
- Constraint & Feedback 
  - SA establishing a standard role/activity building block, setting a constraint on the process portfolio and getting feedback on which processes can and will be adapted
  - SA establishing a standard process pattern, setting a constraint on the process portfolio and getting feedback on what is though to be a more optimal pattern for part of the process flow based on experience with modeling the operational processes
  - SA getting feedback from WBM on process models added to the portfolio (no initial constraint action)

Summary

"I need something of everything"

so that I can

"do the right things"

Enterprise Architect / Business Architect

"I need everything of something"

so that I can

"do the things right"

IT Executive, IT Manager

Provide information on the basis of
"the need to know"
to those that are aware of
"to know the need"

Conclusion

We need to stage continuous improvement on a solid integrated framework, based on good models, understanding of model use, and model management across the different lifecycles and users involved

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Questions