

Collaborative, Distributed Enterprise Modeling



a CAISE 2007
Tutorial by
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Abstract

Collaborative, Distributed Modeling (1.5 hrs)

For too long the architecture effort in many organizations has been concentrated in the hands of a few experts, usually in a central location. This typically causes a bottleneck where architecture cannot keep pace with business change and where results are not effectively translated to action, making architecture an "ivory tower" exercise.

In other cases, where work is done by various groups (e.g. process, applications, data, technical) it is extremely difficult to integrate the outputs/models of the various groups meaningfully and to achieve a coherent "big picture". Problems include scope, notation, nomenclature, naming, timing, ownership and language.

This tutorial covers how these issues can be addressed by consistent, shared meta models, standards, education; distributing the architecture effort; and new tools which support distributed collaborative modeling.

Advantages include: higher quality input and models; acceleration of the architecture effort and higher levels of buy-in across the organization leading to higher architectural compliance and associated benefits.



Agenda

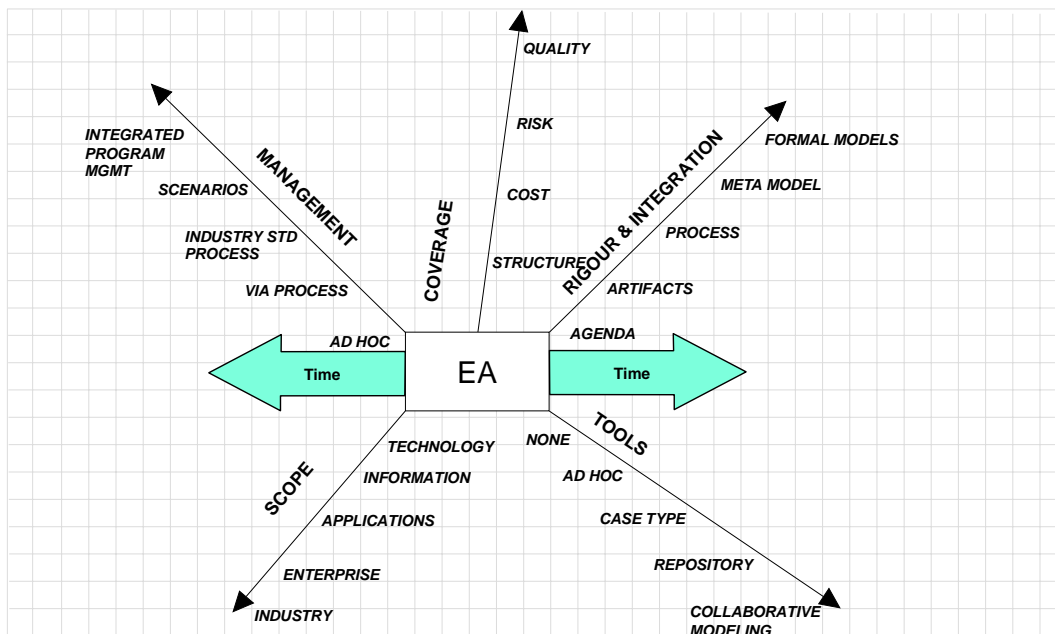


- Challenges for Architects/Architecture in the Organization
- A Vision of Collaboration
- Enabling Collaboration
 - ▶ Models
 - ▶ Methods
 - ▶ Tool Support
- Exercises and Demonstration
- Futures
- Questions

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How the EA Discipline has Evolved



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Challenges



■ The Oracle at Delphi

- ▶ All knowledge collected at a central point
- ▶ One wise person who can provide answers
- ▶ Long trek to get there and long wait before you get an "answer"
- ▶ By the time you get back home you may have forgotten it, or it may no longer be the "correct" one!
- ▶ If you *are* the "oracle" it's a major stress

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■ Rowing in Circles

- ▶ Trying to do it all yourself
- ▶ Too busy to get perspective and maintain direction
- ▶ Too much work
- ▶ Very slow progress, if any...



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Challenges..

■ Multiple Lenses

- ▶ The more eyes/hands/heads & formats information passes through before it reaches us, the more inaccurate it is likely to be



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■ Geography and Time Zones

- ▶ Difficult to get information from all parts of the organization
- ▶ Difficult to get people to communicate in real time



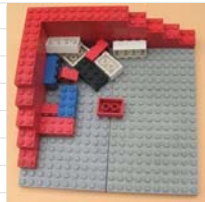
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Challenges...

■ Integrating Perspectives

- ▶ Business, process, data, application, technical, risk, cost...
- ▶ Complicated by different notations, semantics, naming, categorisation, tools, formats



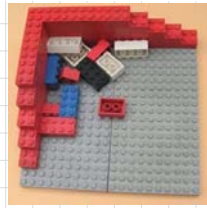
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Challenges...

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■ Identifying elements consistently

- ▶ Debtors DB vs Deb0010
- ▶ Payroll vs QPac

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Benefits of Collaboration

- ✓ Involvement of more perspectives and subject experts
- ✓ Higher quality input and models
- ✓ Distribution of effort and greater total effort applied
- ✓ Reduction of time to produce results
- ✓ Higher awareness and buy in of all relevant parts of the organization => higher architectural compliance
- ✓ Greater agility



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The Web vs The Library

■ Library

- ▶ Central Store
- ▶ One way of organizing content
 - e.g. Dewey or Author
- ▶ Specialist Personnel
- ▶ Limited Access
 - Location
 - Time
 - Assistance
- ▶ Single presentation format
- ▶ Limited search
- ▶ Dated Content
- ▶ Cool for researching the past

■ Web

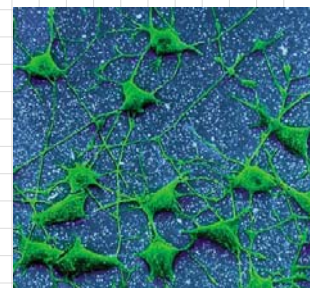
- ▶ Distributed
- ▶ n ways of organizing, indexing, linking content
- ▶ Domain expert personnel
- ▶ Very Wide Access
 - Anywhere
 - Anytime
 - Unaided
- ▶ Multiple presentation formats
- ▶ Powerful Search
- ▶ Dynamic, Current Content
- ▶ Better for building the future

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Like a Central Nervous System

- Multiple sensory organs
 - ▶ Knowledgeable people in the organization and partners
- Filtering
 - ▶ Based upon models of what we need and how it fits
- Storage & Memory
 - ▶ Elements stored with rich content in repository
- Linking
 - ▶ Rich connections make every item more meaningful
- Analysis
 - ▶ Analysis adds meaning and new information
- Recall
 - ▶ Rich query, search, reporting, formatting and output options
- Action
 - ▶ Information and insights available to all other organs to respond appropriately
- Feedback
 - ▶ Communication for how actions affect the world



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Who to Involve

- Business Goals
- Scope of Activity
 - ▶ Map onto Framework
 - Coverage: Zachman
 - Process: TOGAF
 - ▶ Map onto Meta Model
 - Inspired, C4ISR
 - ▶ Depth (Abstraction vs Detail; Type vs Instance)
 - ▶ Organization (& External)
 - Responsibility
 - Geography
 - ▶ Timeframe
 - Architecture view (current, horizon)
 - Project
 - ▶ Questions to be Answered
 - ▶ Desired Outputs/Artifacts (Viewpoints)
- Who
 - ▶ has knowledge?
 - ▶ needs to be committed to result?
 - ▶ will be affected by the result?
 - ▶ can trip us up?
 - ▶ has skills?
 - ▶ can take decisions?



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Managed Chaos

- Meta Models
- Vocabulary
- Taxonomy
(Reference Frameworks)
- Authority
- Responsibility
- Review
- Notification
- Status



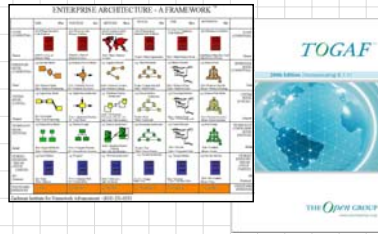
Cathedral of Saint Vitus by Josef Sudek 1928

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Standards

- Naming
 - ▶ Vital for consistency, searching, sorting, relating
- Minimum documentation (e.g. Description)
 - ▶ One way to discourage "new" ones when they should be re-used
- Agreed Meta Model
 - ▶ Absolutely vital to ensure:
 - Coverage of required concepts and scope
 - Agreed types and their meaning
 - Required relationships
 - Desired attributes
 - Scope of a particular effort
 - Integration of elements from diverse sources



- Agreed Process
 - ▶ E.g. TOGAF ADM
- Notation
 - ▶ E.g. Archimate; BPMN (we do not recommend UML, except for Data/Static Models)
- Only ensure a "minimal achievement level"

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VITAL Role of Meta Model

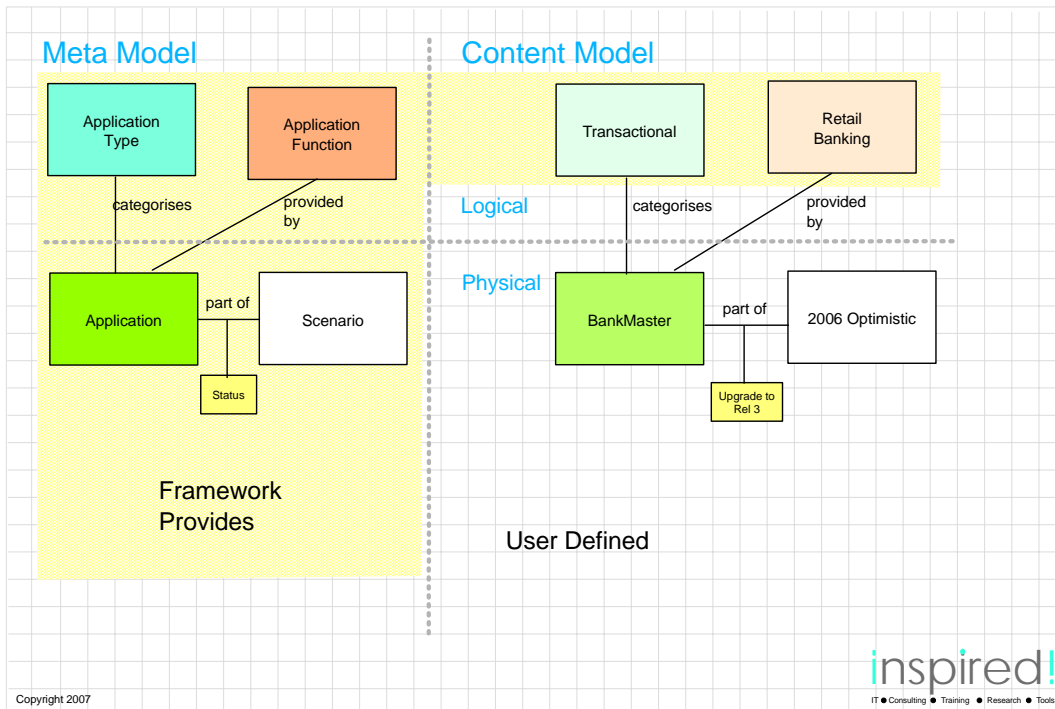


- Architect = Conductor
- Meta Modeler = Arranger

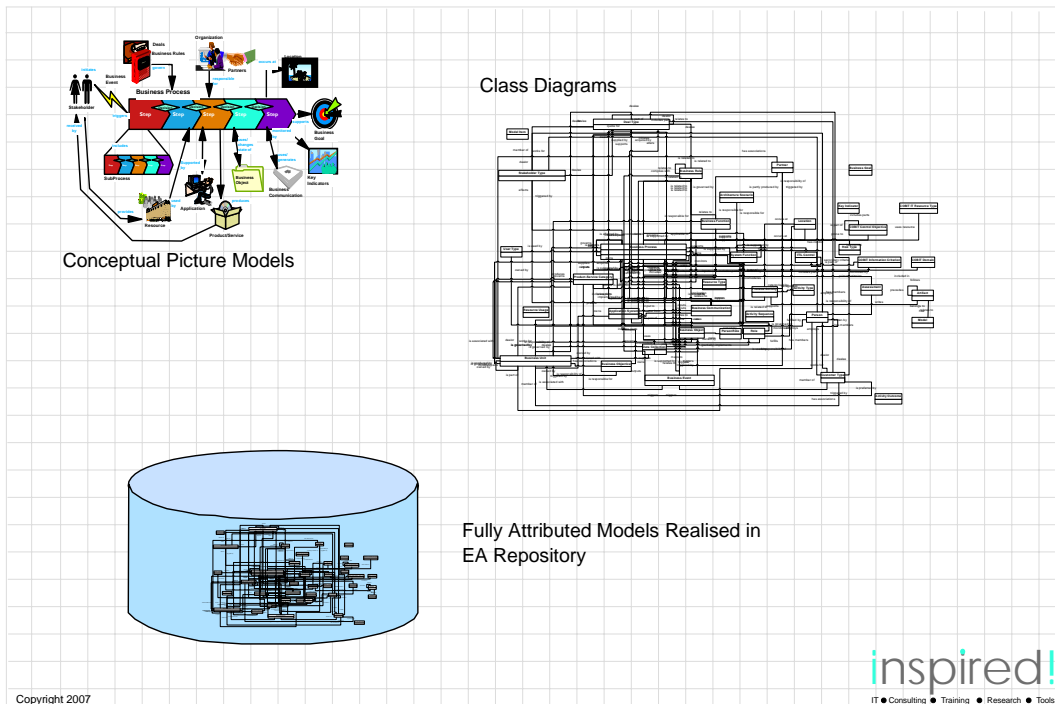
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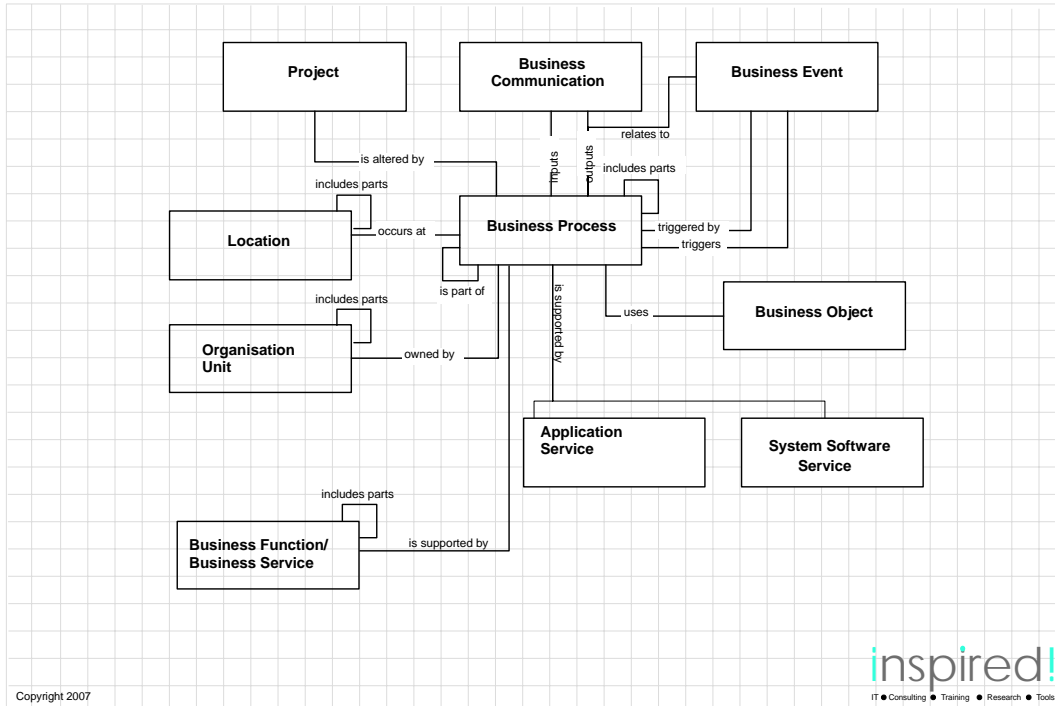
Modeling at two levels of abstraction



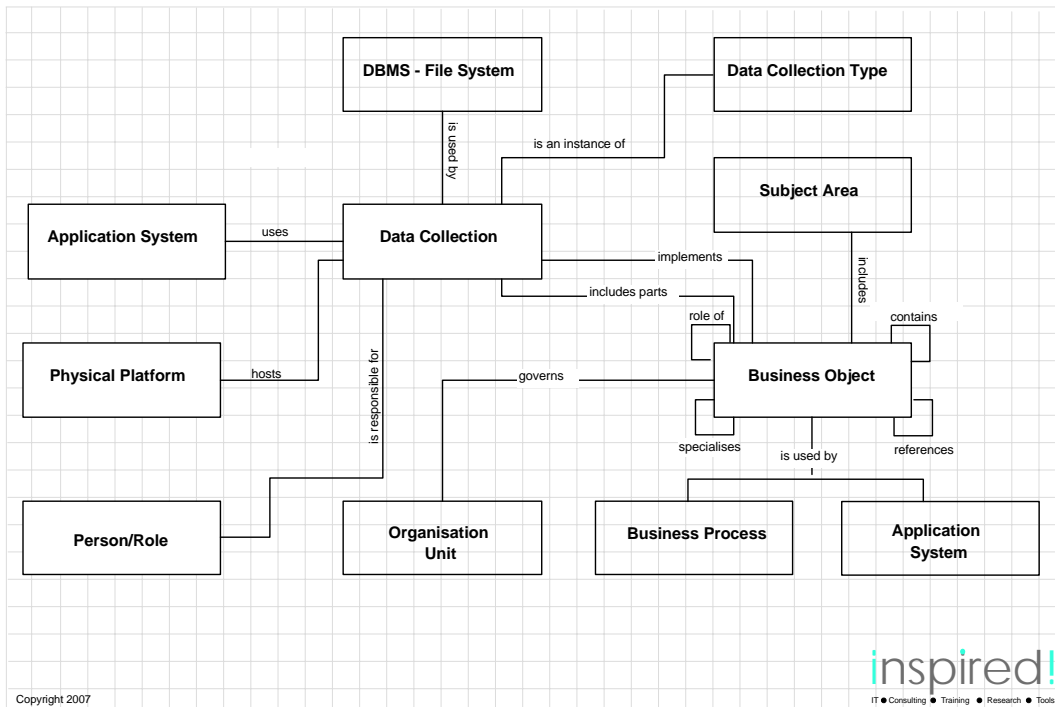
Meta Models Exist at Several Levels



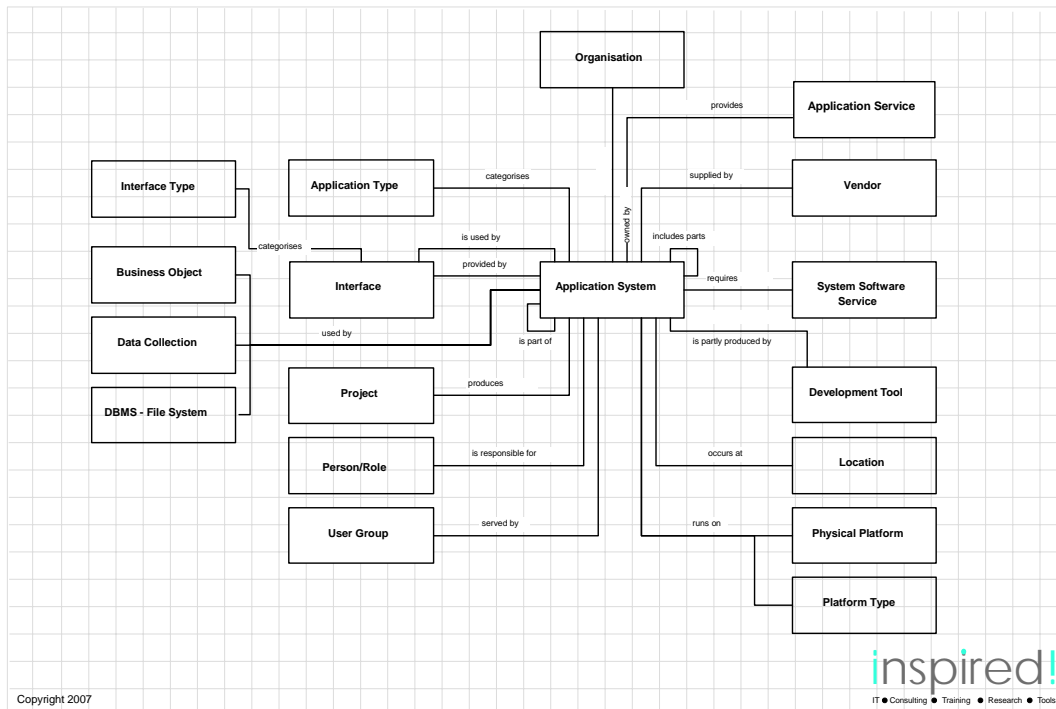
Business Architecture Excerpt



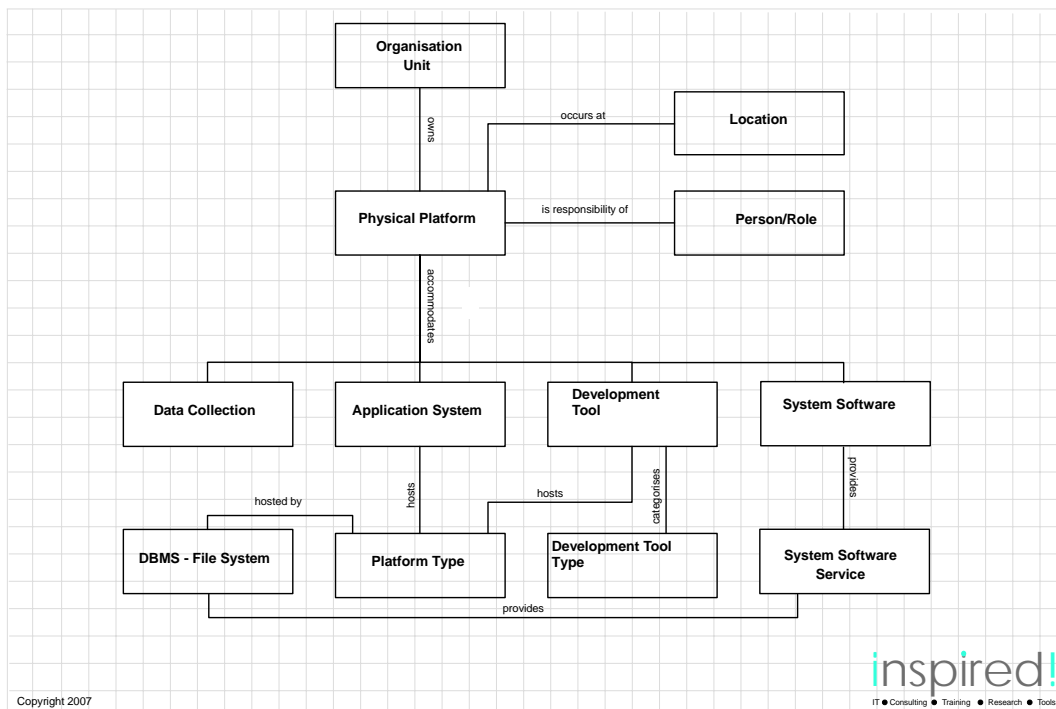
Information Architecture Excerpt



Applications Architecture Excerpt

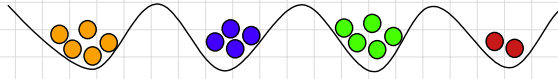


Technical Architecture Excerpt



Role of Ontologies and Reference Models

- **Ontology**
 - ▶ ..seeks to describe or posit the basic categories and relationships of being or existence to define entities and types of entities within its framework
[Wikipedia](#)
- **Reference Models (e.g. TOGAF TAM)**
 - ▶ Provide basic categories and interrelationships for organizing architecture knowledge
 - ▶ e.g. Kinds of application systems; kinds of system software; kinds of data
- **Extremely useful in**
 - ▶ Providing (a relatively small number of) logical or abstract categories
 - ▶ to help us understand the (relatively large numbers of) architecture elements
 - ▶ ALSO to act as a check list when we are looking for architecture elements
 - e.g. What applications do we have for Supplier Management: What Multimedia data do we store: What Security Related system software do we have...
 - ▶ Can provide a language independent reference system
 - Very important in multi nationals with multiple language communities

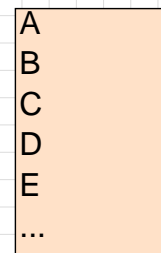


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Process

- **Identify Participants & Roles**
- **Educate Participants**
- **Deploy Mechanism/Tools**
- **Collect Lists**
 - ▶ Use prepopulated taxonomies to accelerate
 - ▶ Use pre-existing lists, models and documents
 - ▶ Possible use of automated collection (but beware glut of meaningless data)

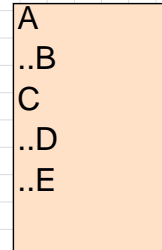


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- Organize into Hierarchies
 - ▶ Describe

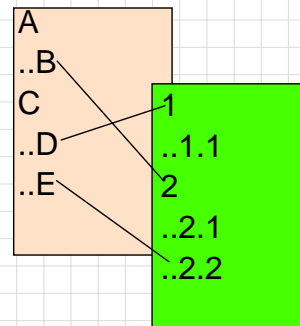


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- Link Across Types

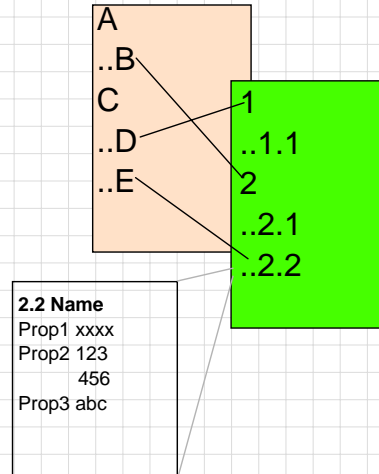


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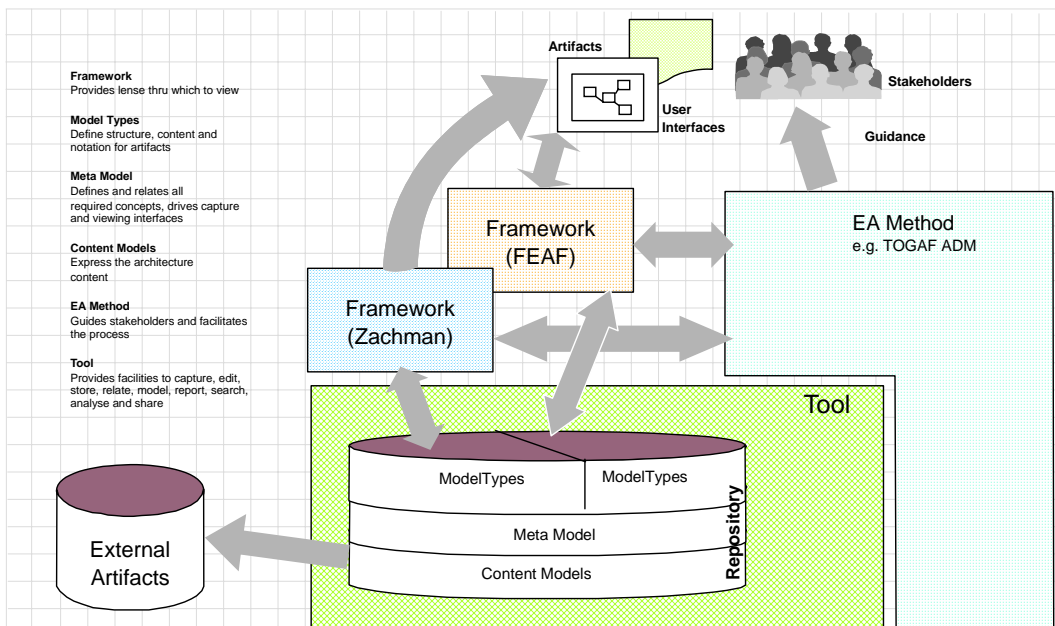
Process

- Identify Participants & Roles
- Educate
- Deploy Mechanism
- Collect Lists
- Organize into Hierarchies
 - ▶ Describe
- Link Across Types
- Verify
- Enhance Detail
 - ▶ Expand Attributes
 - ▶ Decompose
- Enhance Abstraction
- Plan Forward



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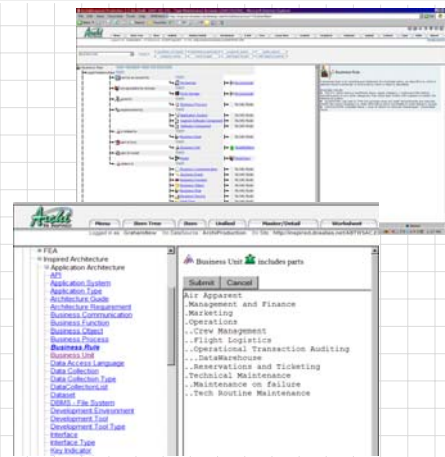
Role of Repository and Tooling



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Tool Support

- Adapt Meta Model
 - ▶ Standard
 - ✦ Enhance for Goals
 - Reduce for Scope
- Assign Responsibilities
 - ▶ Person vs Model Fragment vs Role
- Capture Lists
 - ▶ What have we got
 - ▶ Naming Standards
- Organize Hierarchies
 - ▶ Natural e.g. Organization; Geography
 - ▶ Abstraction e.g. Process Hierarchy; Service Hierarchy; Application Types
 - ▶ Could be multiple for a type

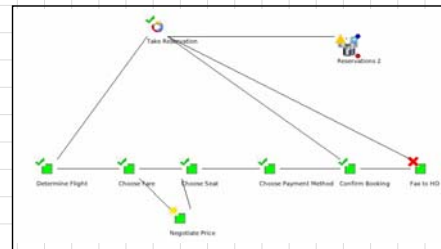
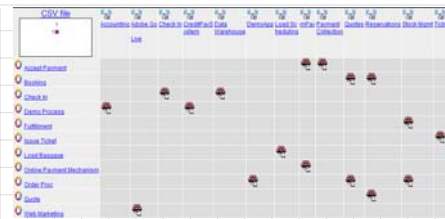


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Tool Support...

- Link Across Types
 - ▶ Relate, Cross Reference
 - ▶ Search/filter and link
 - ▶ May be data about relationship too..
 - ▶ Build Graphical Model
- Enhance Detail
 - ▶ Populate required attributes per type
 - ▶ Decompose
- Event Notification
 - ▶ Who has done something of interest to me?
 - ▶ What data has arrived?
- Communication
 - ▶ News Threads
 - ▶ Wiki Features
- Difference Identification
 - ▶ Across Time (Delta Browser)
 - ▶ Between Models (Difference Models in GM)

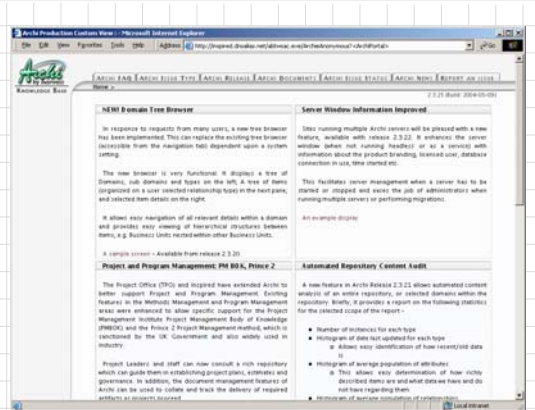


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Tool Support...

- Sharing outputs
 - ▶ Browsing the "knowledge space"
 - ▶ Reports, Generated Documents
 - ▶ Anonymous Access, Portal, Web Sites
 - ▶ Feed to other tools e.g. CSV to Excel, XML to analysis tools
 - ▶ Star Schema to DSS tools
- Web
 - + Repository
 - + Meta Model
 - + View Points
 - Capture Templates/Forms
 - Reports
 - Matrices
 - Graphical Models
 - + Security
 - + Open Exchange



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Futures

- Virtual Whiteboarding
- Video Conferencing
- 3D Spaces
 - ▶ geoDec
 - ▶ Miramar
 - ▶ Croquet
- Research
 - ▶ Advanced meta modeling techniques
 - ▶ Collaborative modeling in virtual spaces
- What we can learn from online games
 - ▶ e.g. Spore from Will Wright
- Emergence
 - ▶ Where architectures connect themselves from elements endowed with behaviour and rules



"The best way to predict the future is to invent it"

Alan Kay

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References

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