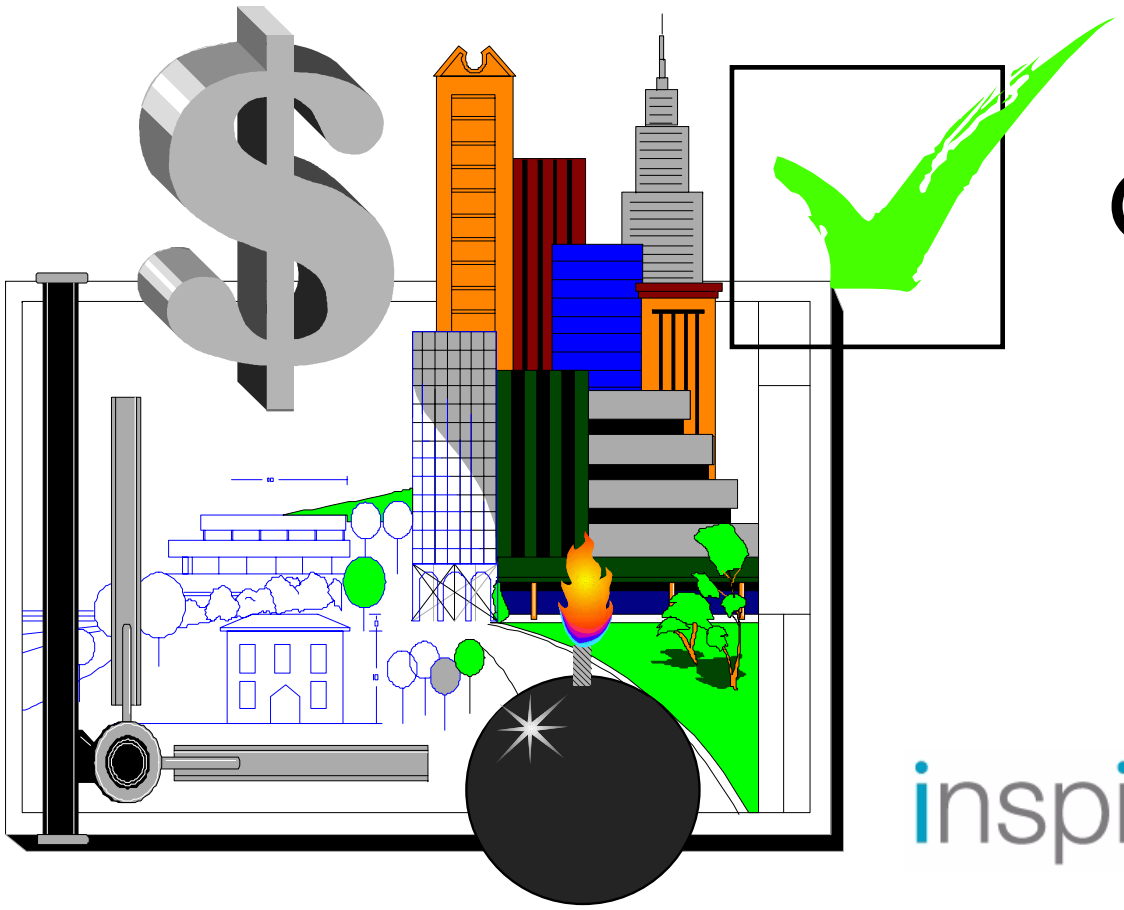
Enhancing Enterprise Architecture Models with

Cost, Quality and Risk Dimensions



Graham McLeod

June 2003

Inspired / Promis Solutions AG

at University of Cape Town

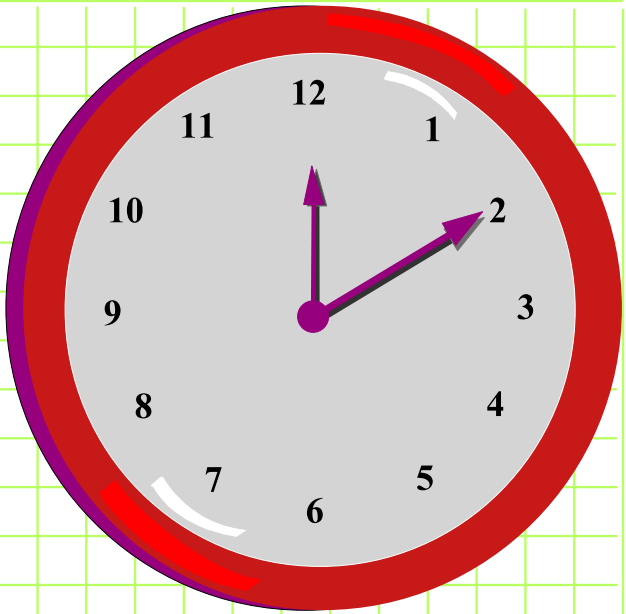
inspired!

PROMIS

We deliver Solutions!

Coverage

- Enterprise Architectures
- Traditional Models
- Inspired Model
- Operationalising the Model in a Knowledge Repository
- Challenges for Organizations post 2000
- Extending the Models
- Demonstration
- Conclusions
- Questions



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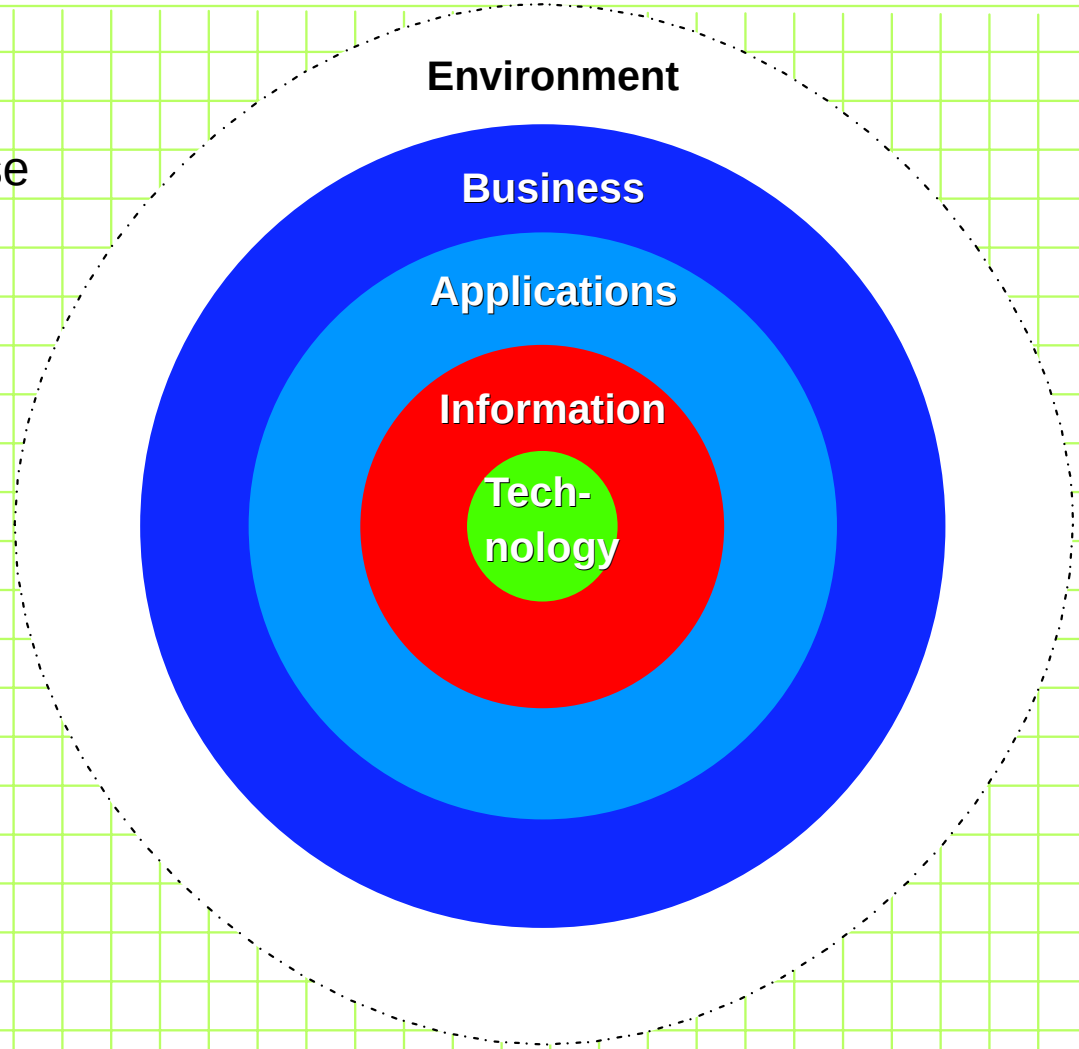
What is an Enterprise Architecture?

1. Blue Print
   - ▶ High Level Conceptual Design
   - ▶ Covers whole business/ enterprise
   - ▶ A current "best plan"
   - ▶ Guides acquisition and implementation choices
2. An inventory
   - ● What have we got?
   - ● How good is it?
   - ● Redundancies
   - ● Gaps



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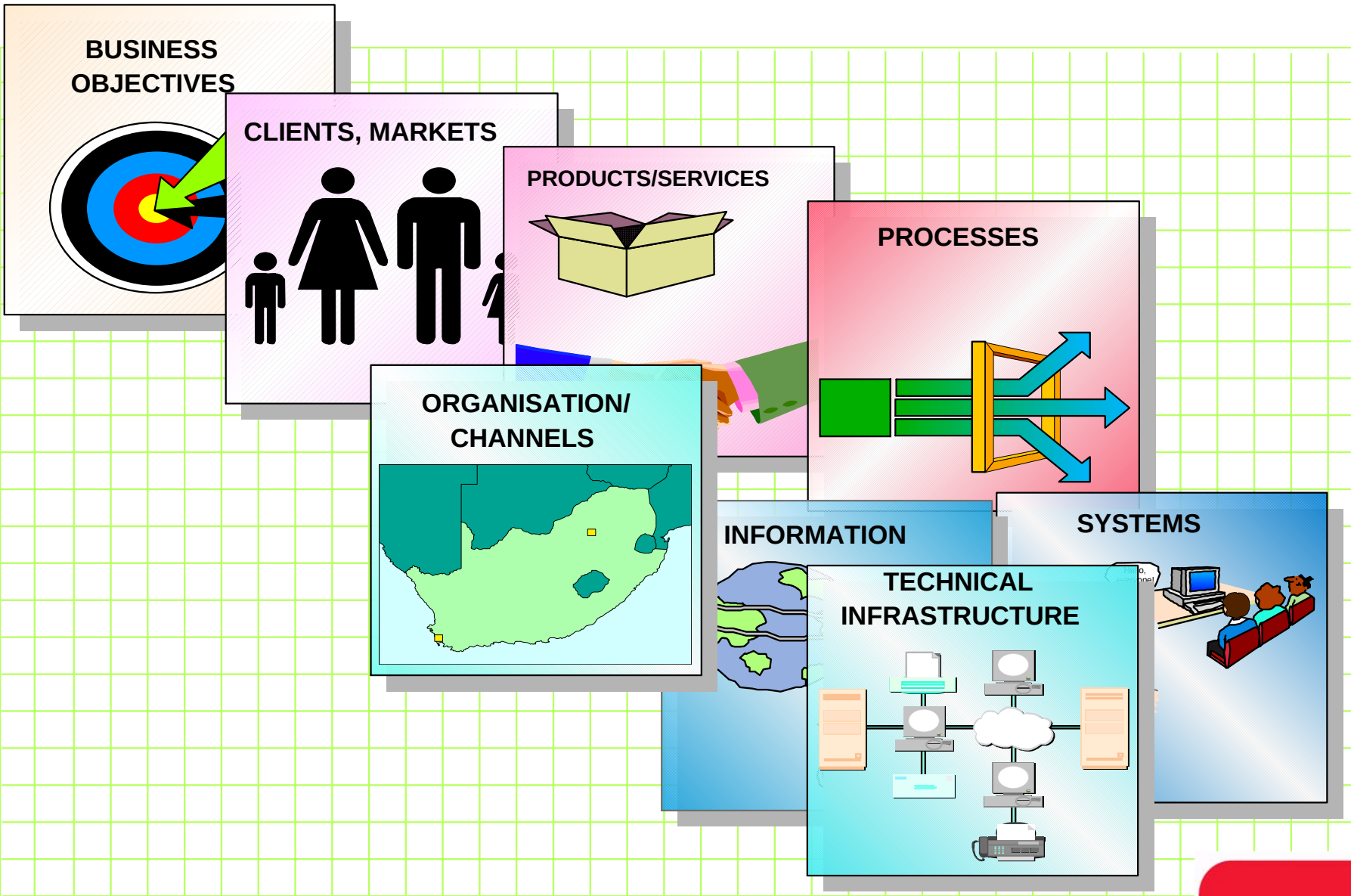
Facets of a Business



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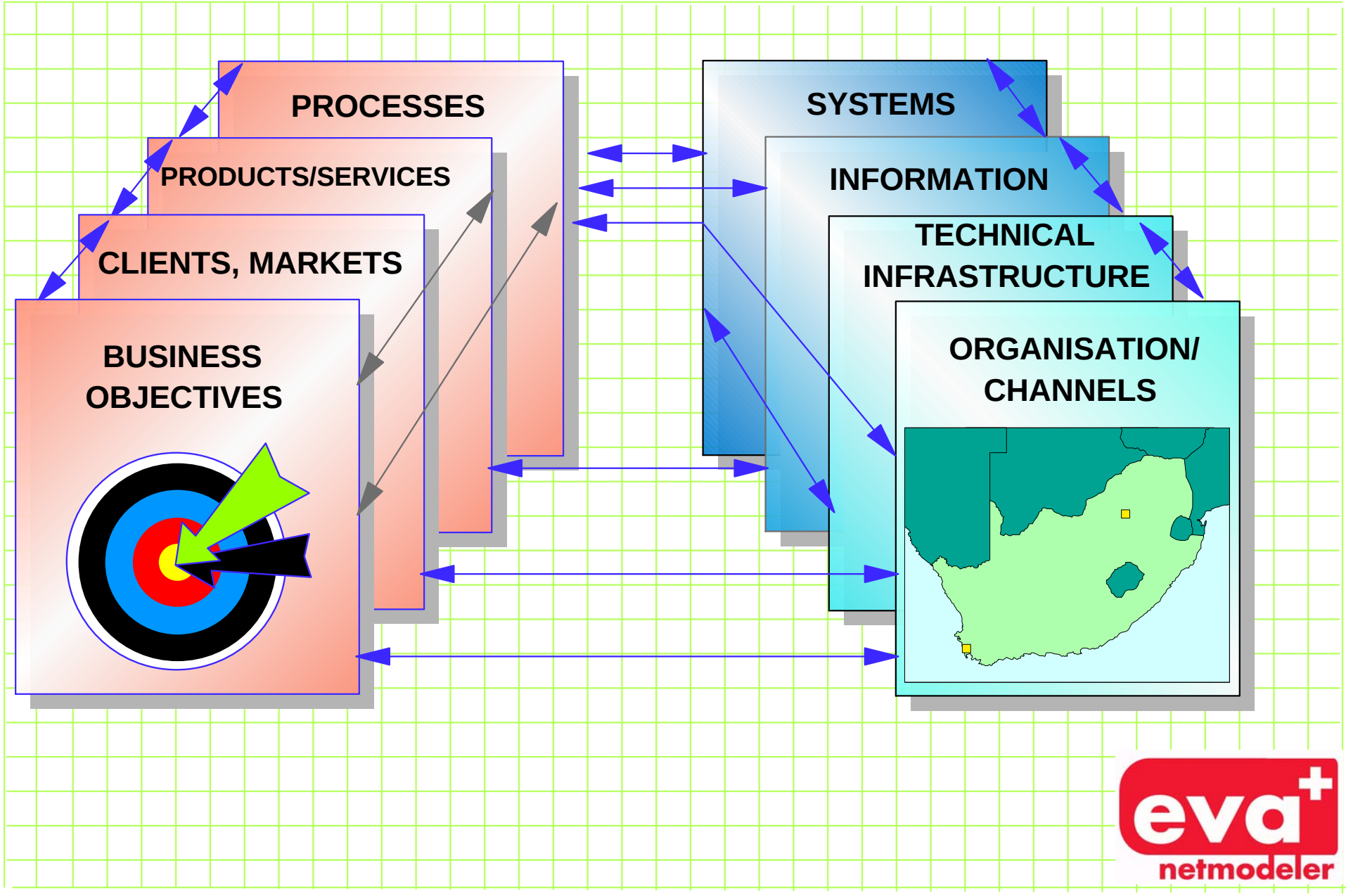
Facets of a Business - Relationships



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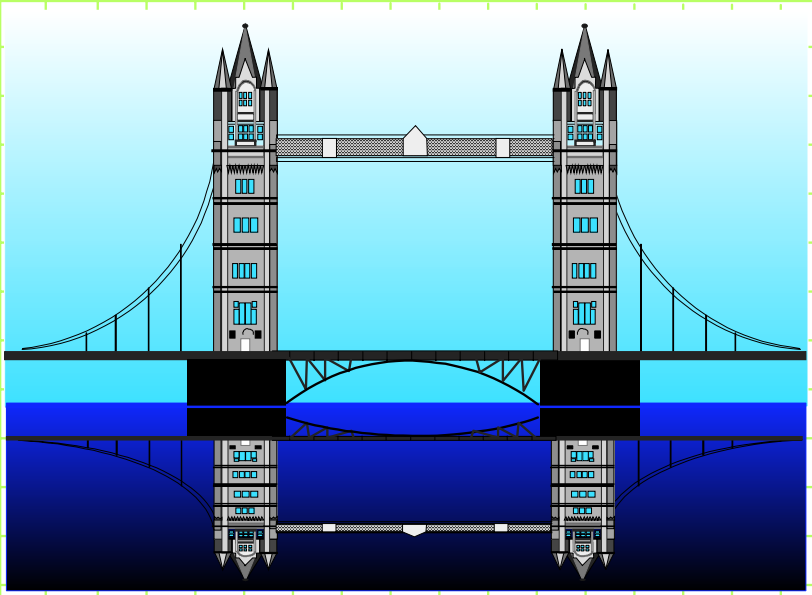
Why We Need Enterprise Architecture



- Improve business benefit derived from I.T.
- Reduce costs associated with I.T.
- Reduce risk in adopting and exploiting I.T.
- Enable desirable business changes, pursuit of opportunities.
- Shorten lead times to realizing benefits.
- Exploit emerging technologies which can provide strategic advantage.
- Provide framework for decision making and practice within development, technology purchase and operations.

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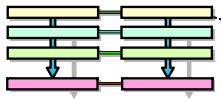
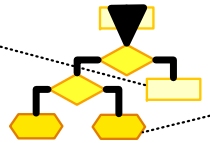
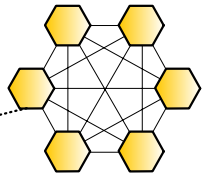
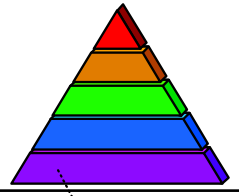
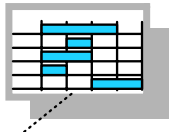
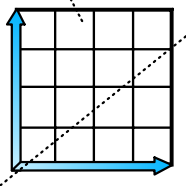
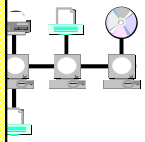
Coverage of an Enterprise Architecture - Zachman

	DATA	FUNCTION	NETWORK	PEOPLE	TIME	MOTIVA-TION
SCOPE	Identify Entities	Identify Business Processes	Map of Business Locations	Identify External & Internal Agents	List Significant Events	Business Goals and Strategy
ENTER-PRISE MODEL	Entity Relati onship Model	High Level Process Flow Diagram	Logistics Network	Organization Chart	Master Schedule	Business Plan
SYSTEM MODEL	Attributed Data Model	Data Flow Diagram	Distributed System Architecture	Human Interface Architecture Function<=> Person Role	Processing Structure	Knowledge Architec-ture
TECH-NOLOGY MODEL	Relational Model	Module Structure Chart	System Architecture	Human Technology Interface	Control Structure	Knowledge Design
COM-PONENTS	Database Schema	Program Source	Network Architecture	Security Architecture	Timing Definition	Knowledge Definition
FUNCTION-ING SYSTEM	Database	Program Object	Network	Organization	Schedule	Strategy

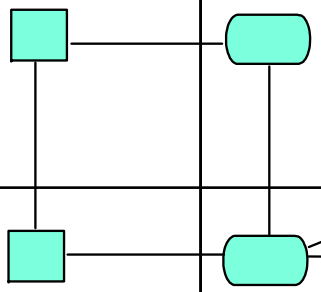
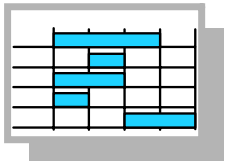
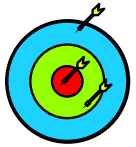
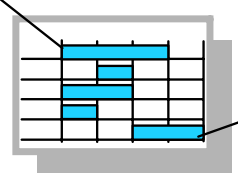
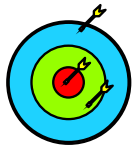
Models in the Zachman framework

	DATA	FUNCTION	NETWORK	PEOPLE	TIME	MOTIVA-TION
SCOPE						
ENTER-PRISE MODEL						
SYSTEM MODEL						
TECH-NOLOGY MODEL						
COM-PONENTS						
FUNCTION-ING SYSTEM						

Models are tightly coupled within a cell, but loosely / informally integrated across cells.

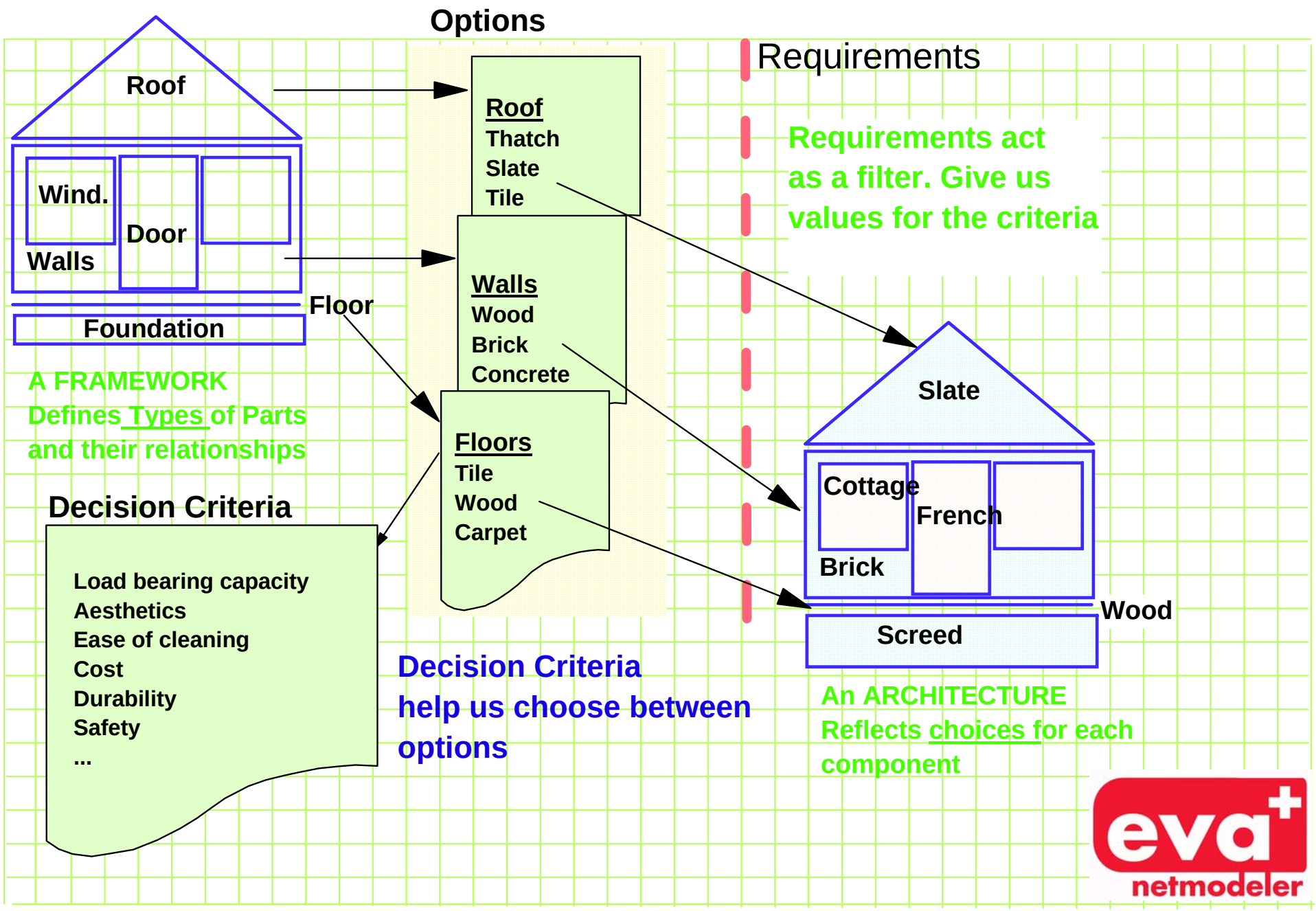
Semantics are not resolved or normalised.

Models in the Inspired Framework

	DATA	FUNCTION	NETWORK	PEOPLE	TIME	MOTIVA-TION
SCOPE						
ENTER-PRISE MODEL						
SYSTEM MODEL						
TECH-NOLOGY MODEL						
COM-PONENTS						
FUNCTION-ING SYSTEM						

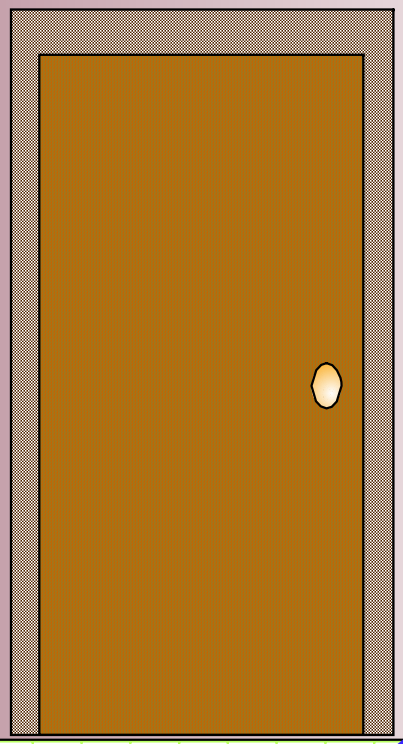
Integrated model spans all areas of concern/interest. Semantics are resolved and unified. Relationships defined across all dimensions.

Framework and Architecture



Components, Standards, Interfaces

Standards are vital to enable parts to fit and work together, even if provided by multiple suppliers



A frame may be chosen to fit a "standard door", for example

There can be flexibility in the actual components chosen, provided that they meet the requirements and interoperate correctly

Wall sockets will take a standard plug

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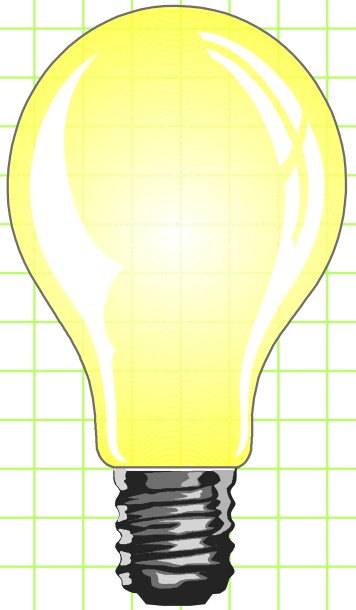
Key Concepts

- Framework
  - Zachman - what should be addressed, suggested models
  - Inspired - what elements are there, how are they interrelated, what state are they in, how should they evolve, how do we manage this?
- Components
- Interfaces, boundaries, responsibilities
- Per Component and Interface
  - Requirements
  - Criteria
  - Choices
  - Standards



Application (1 of 4)

	CRITERION	COMMENTS	REFERENCE
1	Consistent with Business Objectives		Business Architecture
2	Data Resides in a formal database compatible with Technical Architecture	Typically relational with ODBC or SQL 2 access. DRDA also acceptable. Object DB OQL, ODMG 2.0	Application Delivery Architecture, Technical Architecture, Platforms
3	Data Model is available and expressed in a standard form	Normally Entity Relationship Diagram or UML Class Diagram. Meta Data online	
4	Runtime environment is compatible with Technical Architecture	Relates to processor family, DBMS, operating system, etc.	Technical Architecture, Platforms, Application Programming Interfaces
5	Supplier is approved, stable and has sound strategy	Local support capability preferred	
6	Meets functional requirements		Business Architecture, Processes
7	Application will scale to anticipated volumes (5 years)	Check file (batch), transaction and number of users limits	Business Architecture, Products and Services

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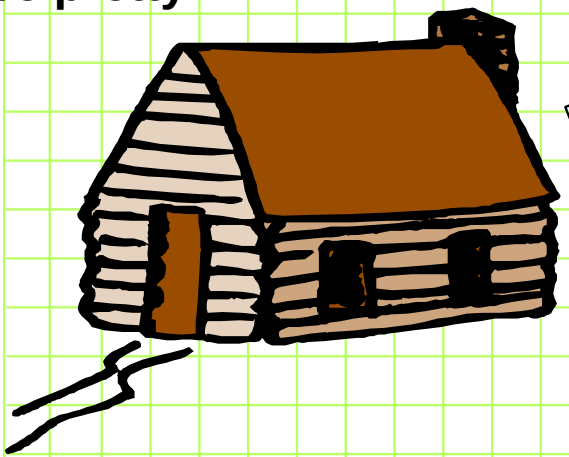
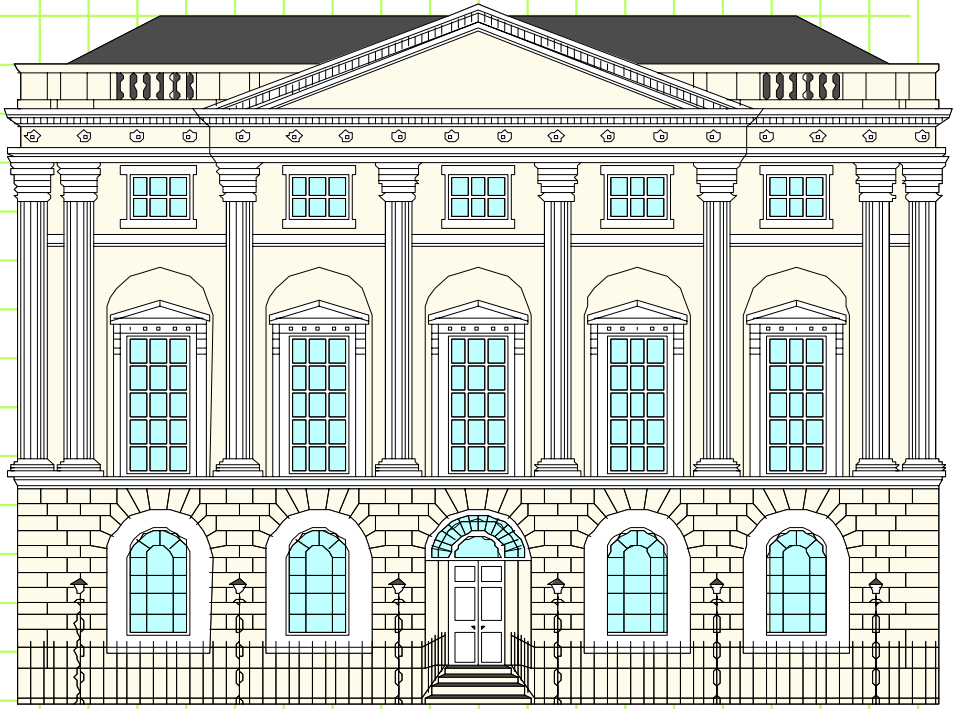
Current and Future Architecture

Strategy is about moving from one to the other with minimal disruption, risk, effort and cost

The current organization, systems, data, networks and infrastructure has an architecture too. It may not be pretty...





The desired goal may not be attained in full, but it is a target to aim for..

It can change over time to reflect new priorities, realities or needs

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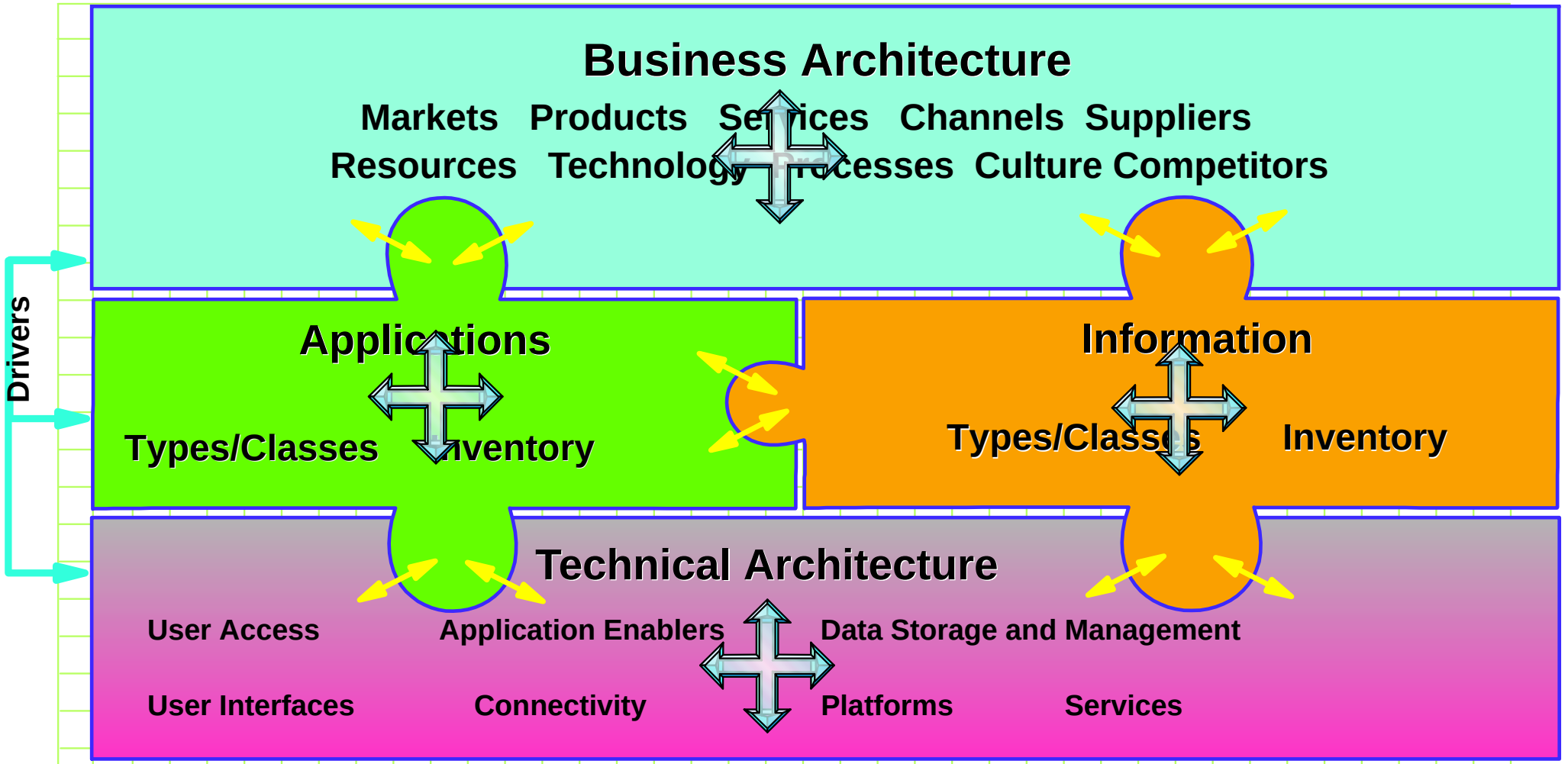
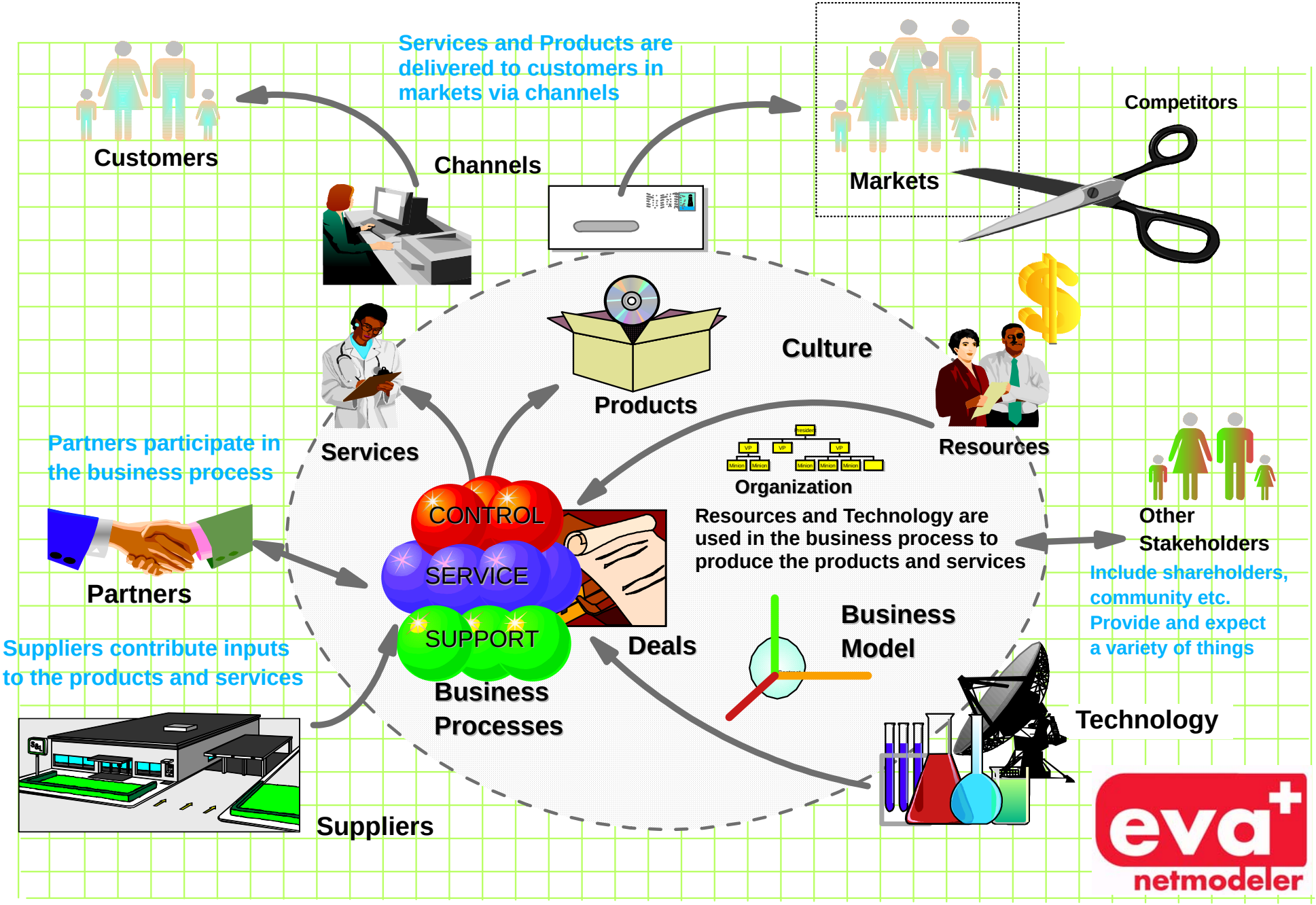
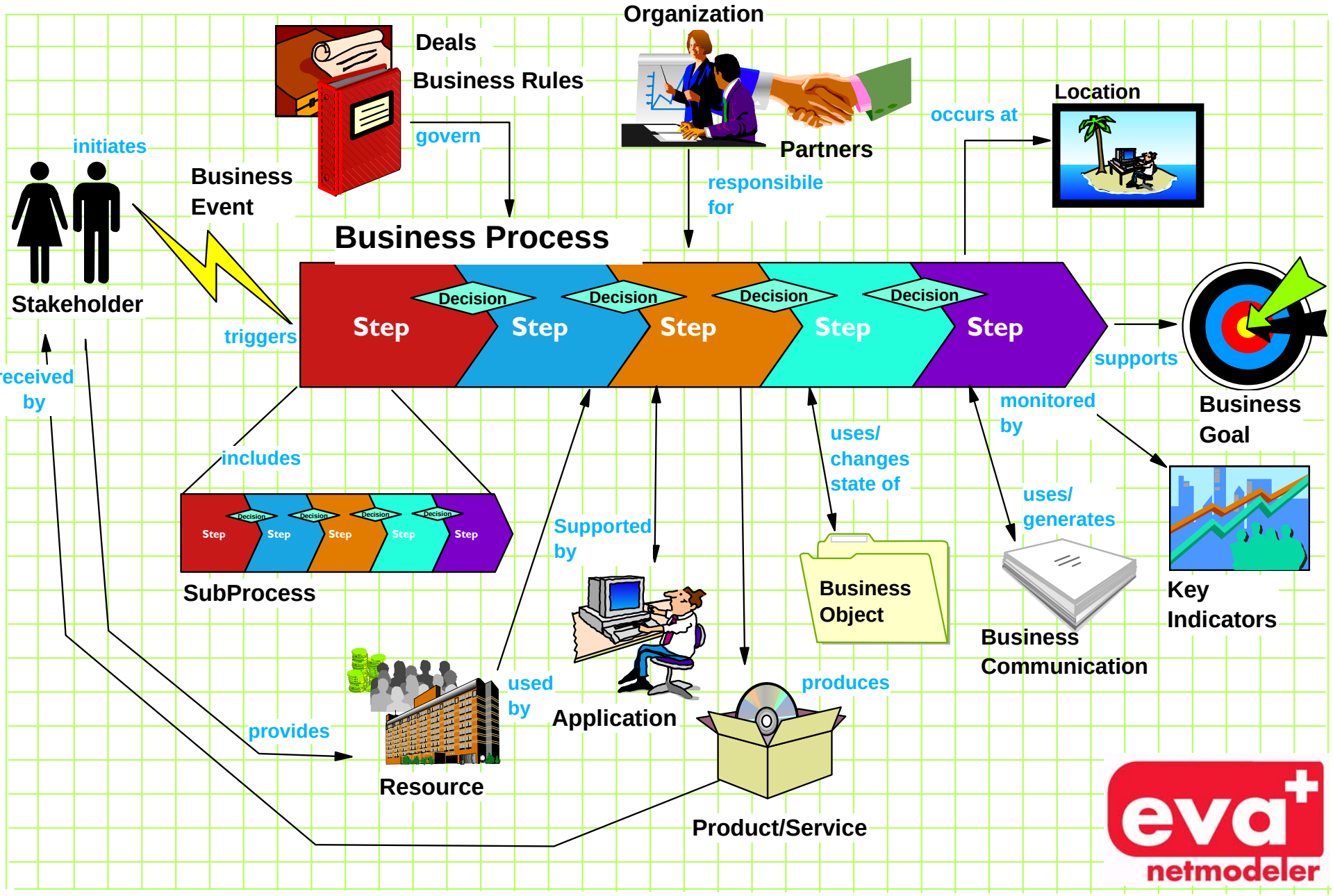
The Inspired Frameworks



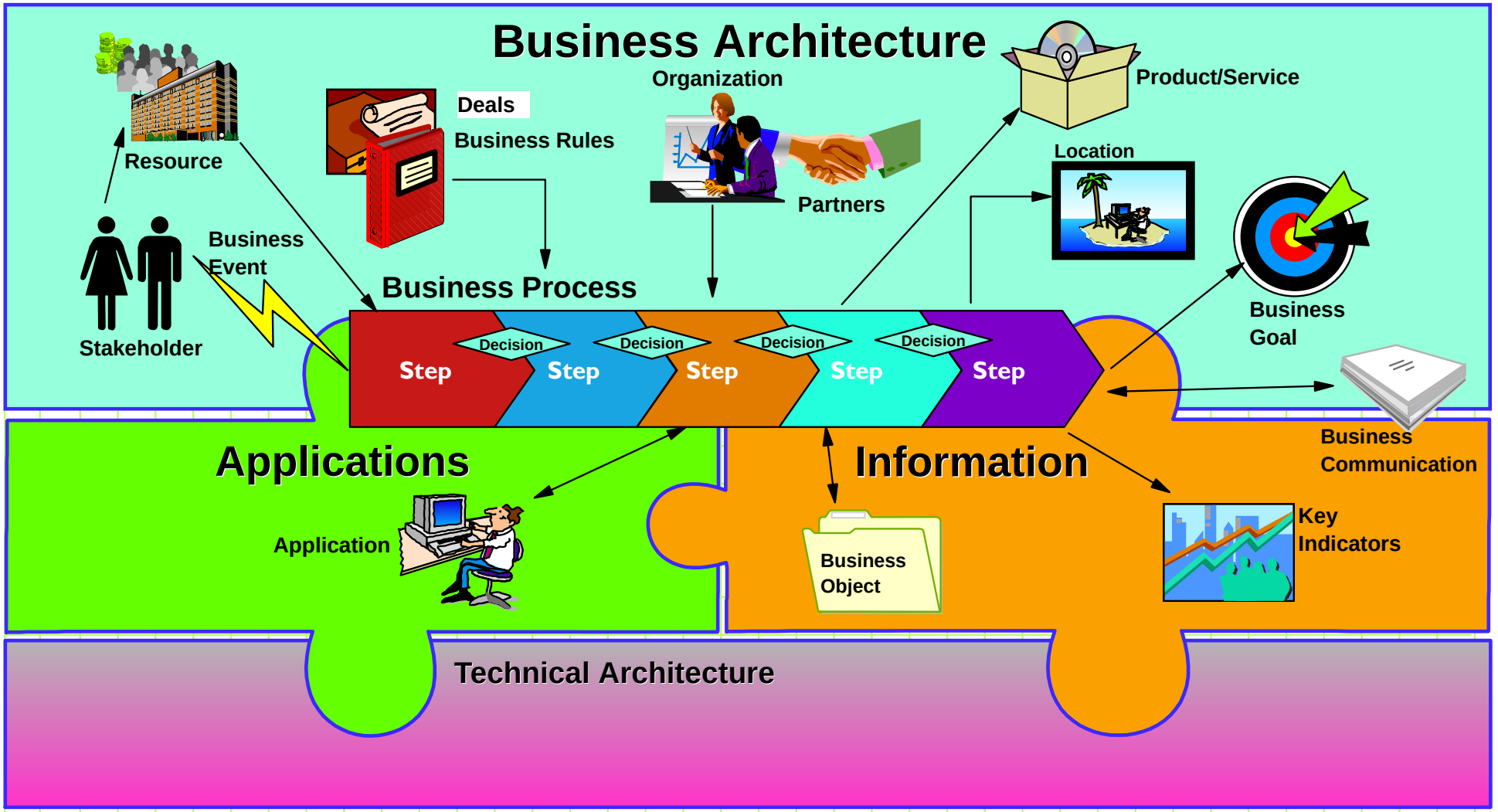
Business Architecture



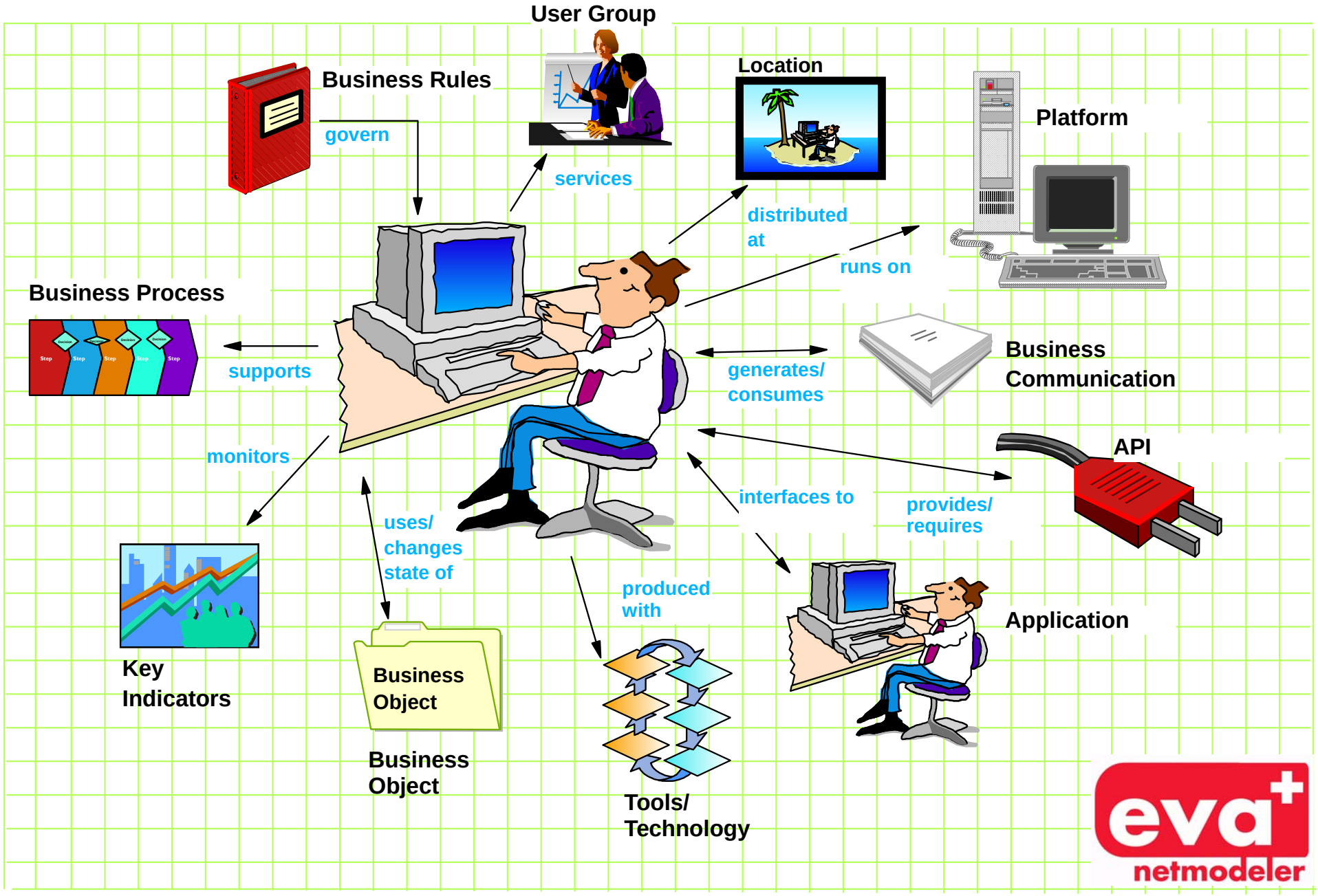
Business Process Architecture



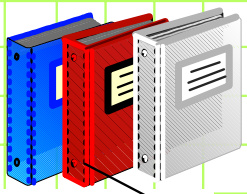
Focusing on an Element



Application Architecture



Information Architecture



Subject Area

includes

Describes:
- Products
- Services
- Customers
- Staff
- Processes
- Activities...

Business Object

Attributes

name	
balance	
date	
location	

Related Business Object

uses/ changes state of via

Computer System

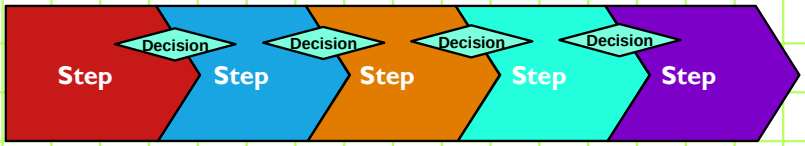
requires

stored in/ retrieved from

Information Types

Database

Business Process



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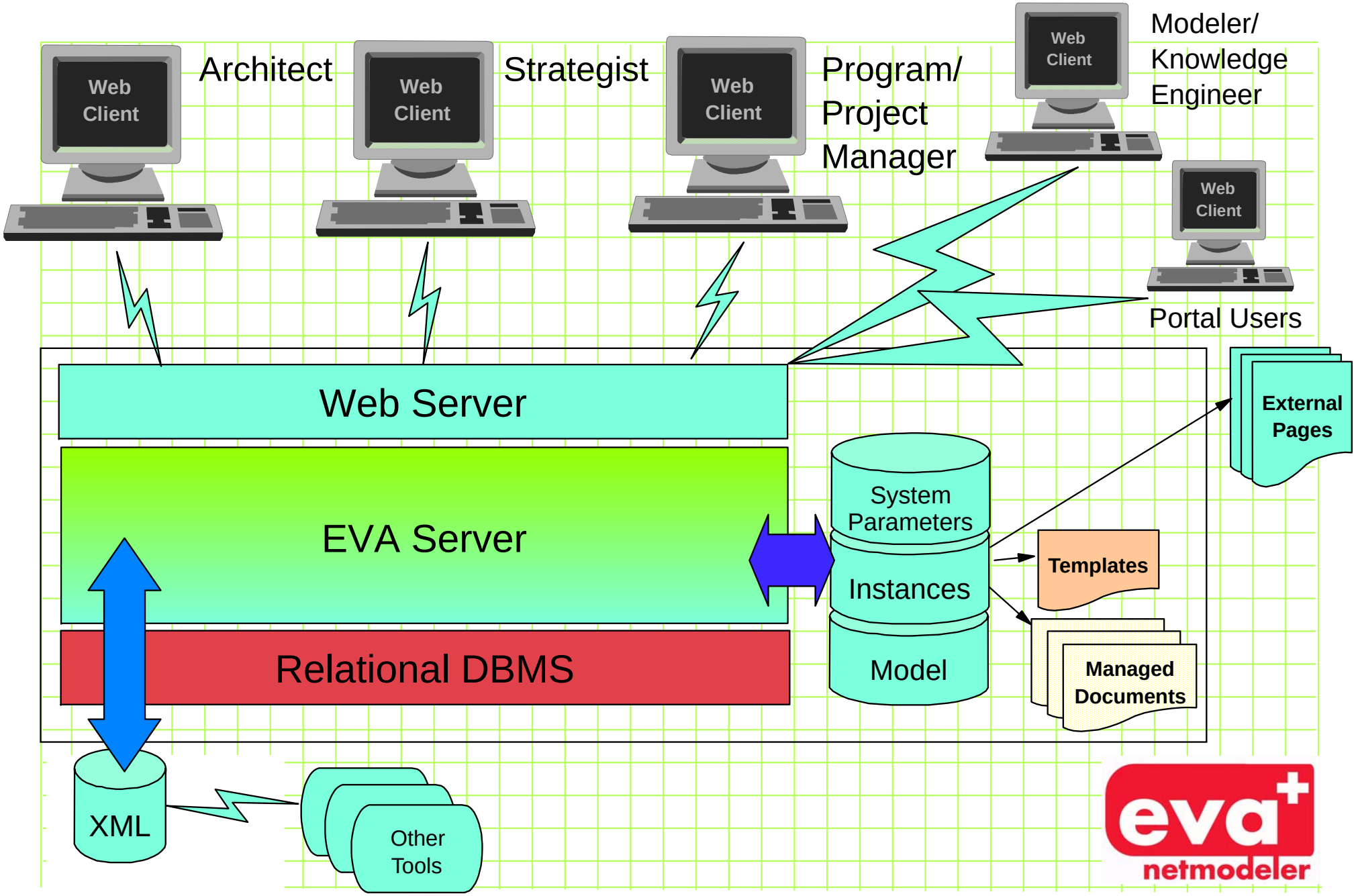
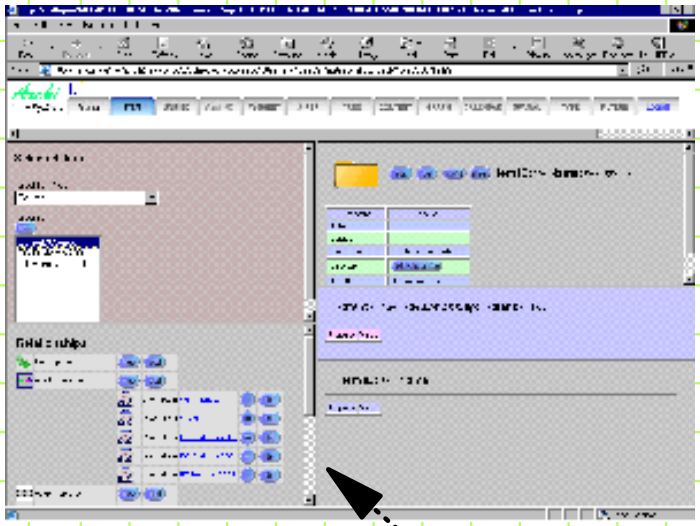
EVA Architecture

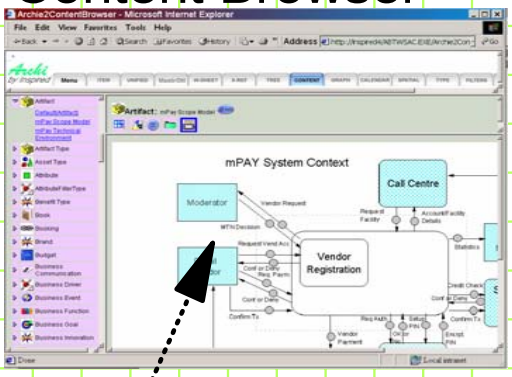


Different Views of the same Data

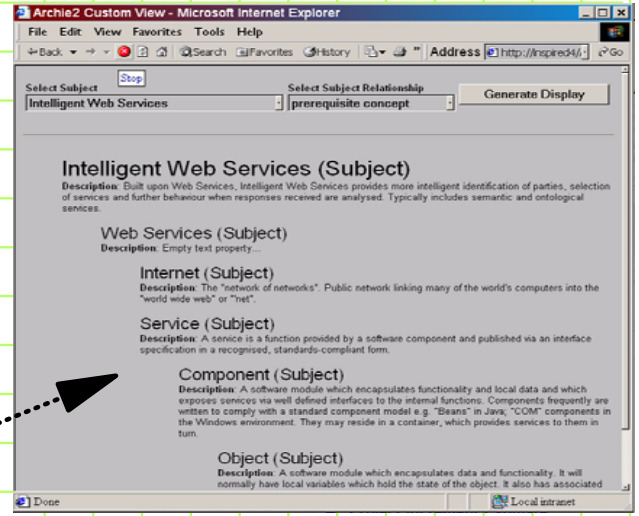
Item Browser

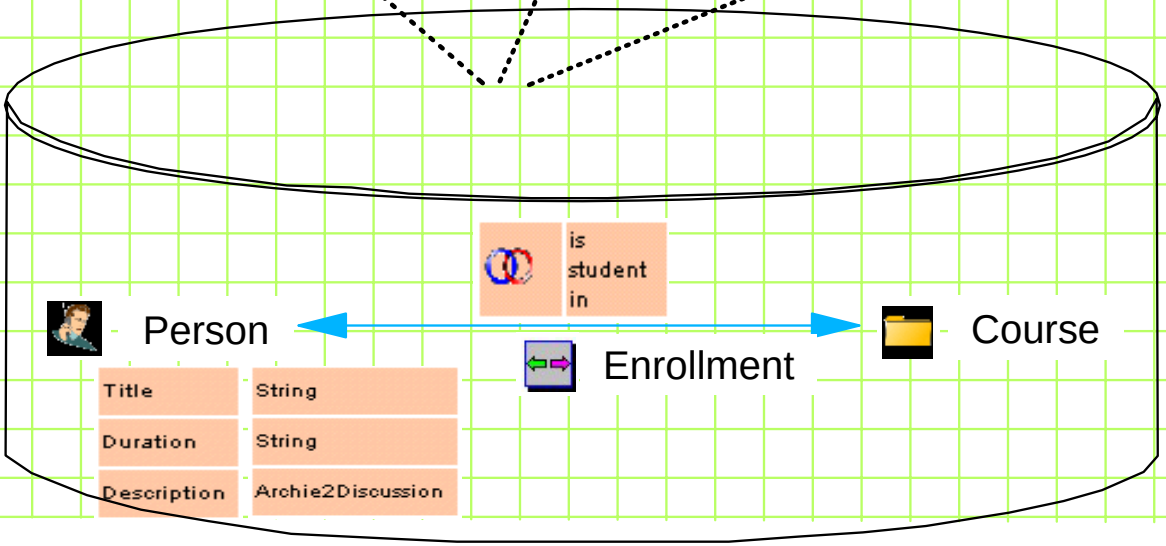


Content Browser



Custom View





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Demonstration

Show Architecture Meta Model
Knowledge Management
and Navigation in EVA

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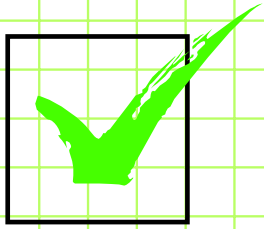
Challenges for Organizations post 2000

- Costs
  - Imperative to have low cost base to survive and be competitive
- Quality
  - Necessary to have sustained market acceptance
  - Required to contain costs
  - Focus for continuous improvement
  - Key way to achieve higher levels of productivity (especially in IT critical organisations)
  - Requires metrics, baseline, monitoring
- Process Management
  - Allows focus on end to end chain of events leading to customer / stakeholder value
  - Cuts across traditional organizational/functional boundaries
  - Needs a holistic view, since it can be risky to reengineer what we don't understand
- Risk
  - Sept 11 and other events made people acutely aware of need to manage risk



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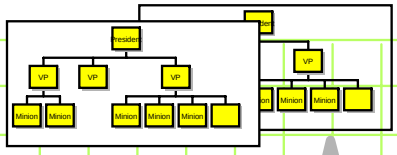
Enhancing the Models - Cost Perspective



Business Unit

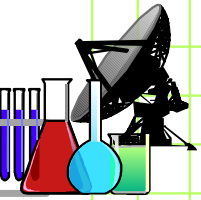
Deals

Channel

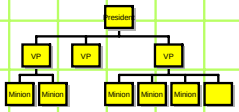
Application

Cost Centre

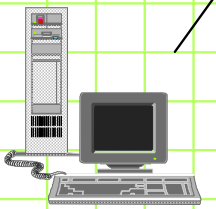
Resource



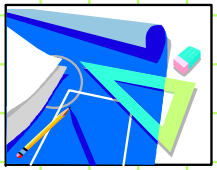
Technology



Business Unit



Platform



Project

DBMS

Turns out that most of the cost elements are already in the architecture models!

We need to add attributes to individual items to record the various relevant costs; then implement a mechanism to accumulate them. This adds a model element for Cost Centre. Costs accumulated there can, in turn, be apportioned across business units.

This is a flexible approach that allows various cost categories to be monitored - various models can be simultaneously implemented

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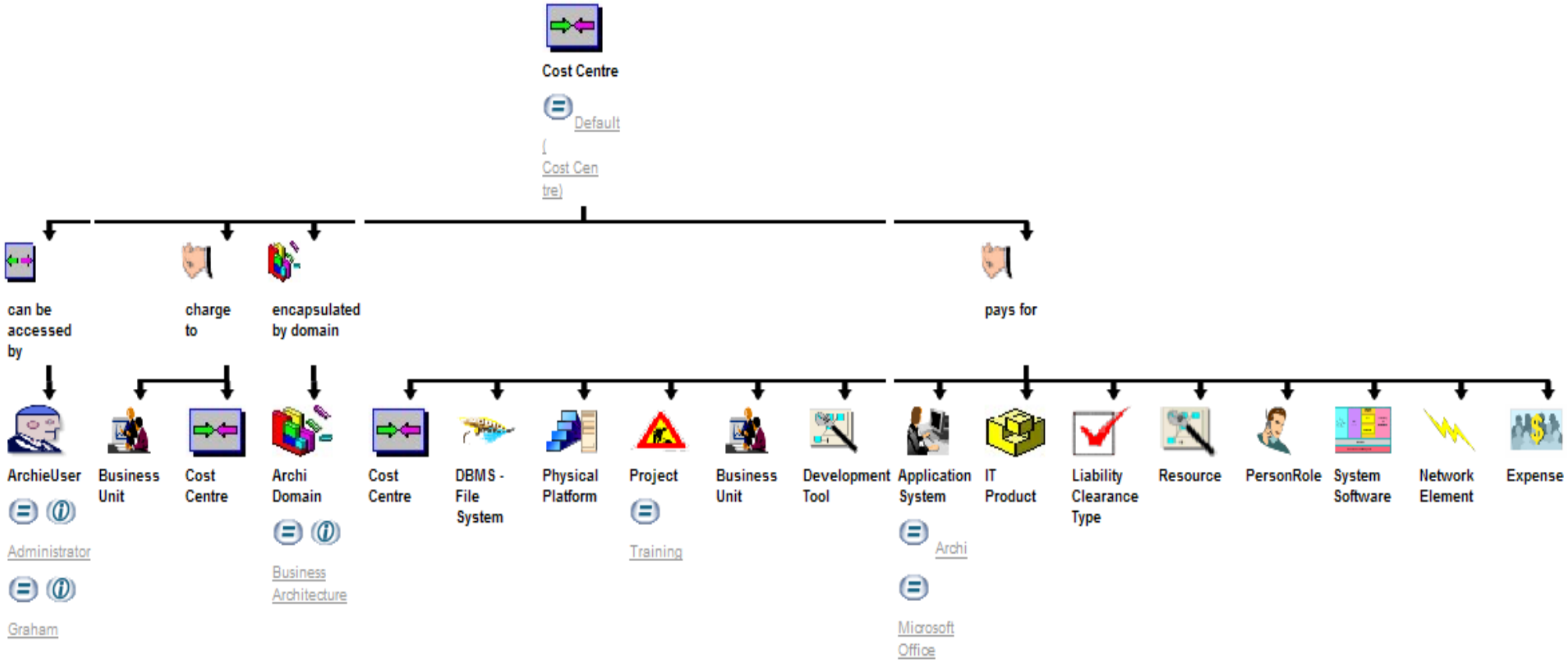
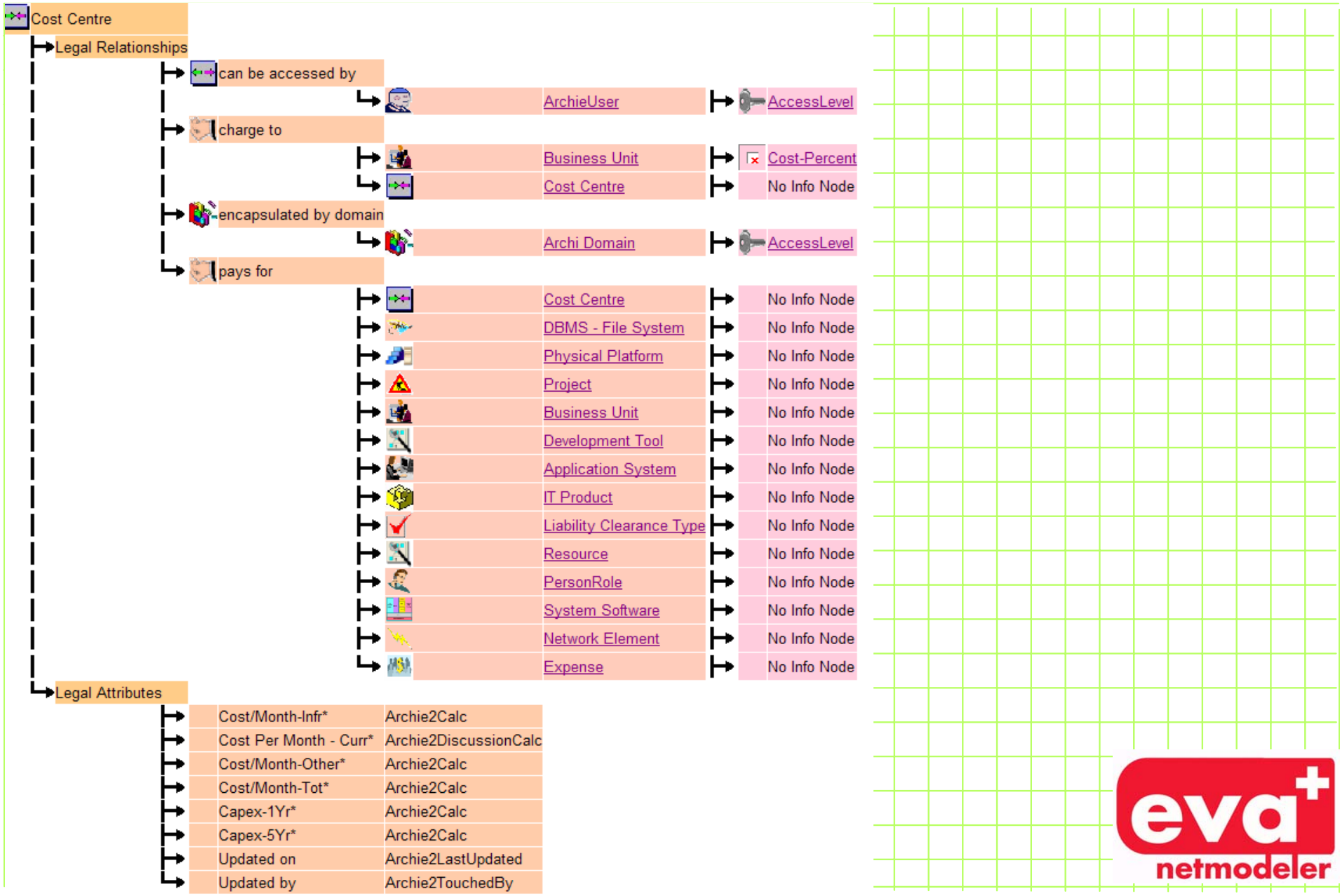
Cost Centre Model in EVA



Cost Centre Type Definition



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Derivation of Values

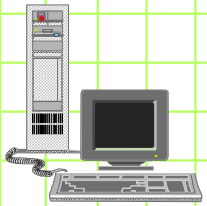
Declarative formulas are created in "Calculated Property" Fields

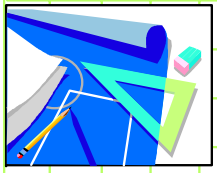
These are similar to the concept of a spreadsheet formula, but can reference

- Attributes of item on which the formula is defined
- Attributes of related items
- Other items (e.g. a global rate) elsewhere in the repository via type/name/attribute name

Formula on Cost Centre pulls details together and computes summary

Formulas on Business Units pick up their proportion of expenses





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'Cost Per Month - Curr') +
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(aAttrValue tNodeType: 'Project' propVal:
'Cost Per Month - Curr') +
(aAttrValue tNodeType: 'Application System' propVal:
'Cost Per Month - Curr').

Cost Centre

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Demonstration

Show Model Extensions
Links to Cost Centre
Derivation of Values
in EVA

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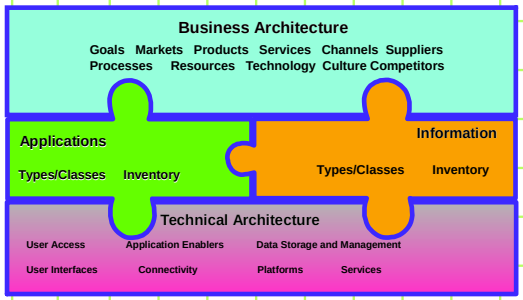
Architectures and Process Management Enable Quality Improvement



Profit
Quality of Deliv.

Product

Process

Thruput
Error Rate

Uptime
User Satisfaction

Applicat'n

Database

Data Quality
Availability

MTBF
MTTR

Platform

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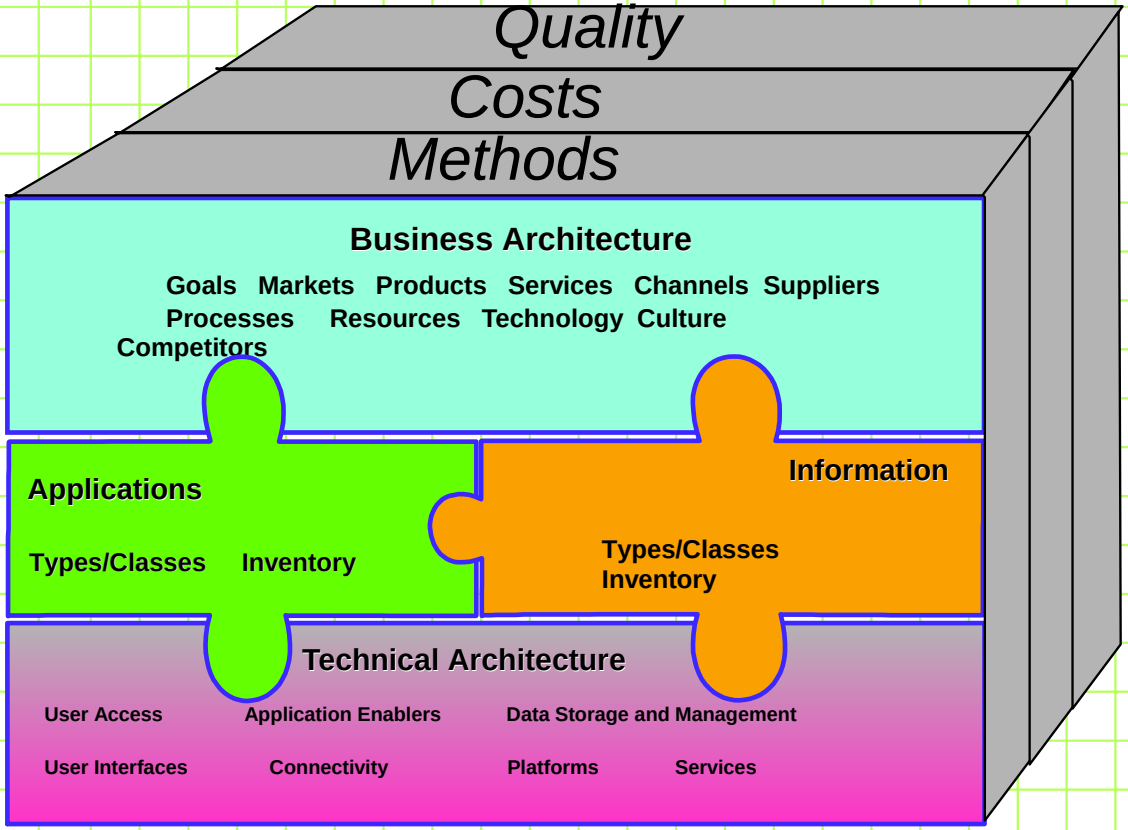
Third Dimension



Models can be enhanced with additional dimensions of

- Methods, Process, Deliverables
- Costs
- Metrics and Quality

The above can reflect both

- Current Position
- Benchmarks from Industry/ Competitors
- Goals

TIMING and RISK can also be brought into the picture..

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Conclusions

- Enterprise Architecture Models
  - Form an excellent foundation for integrated modeling of extra dimensions including
    - Cost
    - Quality
    - Risk
  - Allow strategic planners, architects and business managers to view
    - Current Picture
    - Future Scenarios

    with proper appreciation for implications of decisions
- Potential for future integration of architecture models
  - with ERP systems for integrated planning and management
- Challenges
  - Keeping models updated and in synch with planning, ideas, shifting realities
    - Possible solutions: time triggered reminders; distributed responsibility; feeds from / to other systems (XML based)

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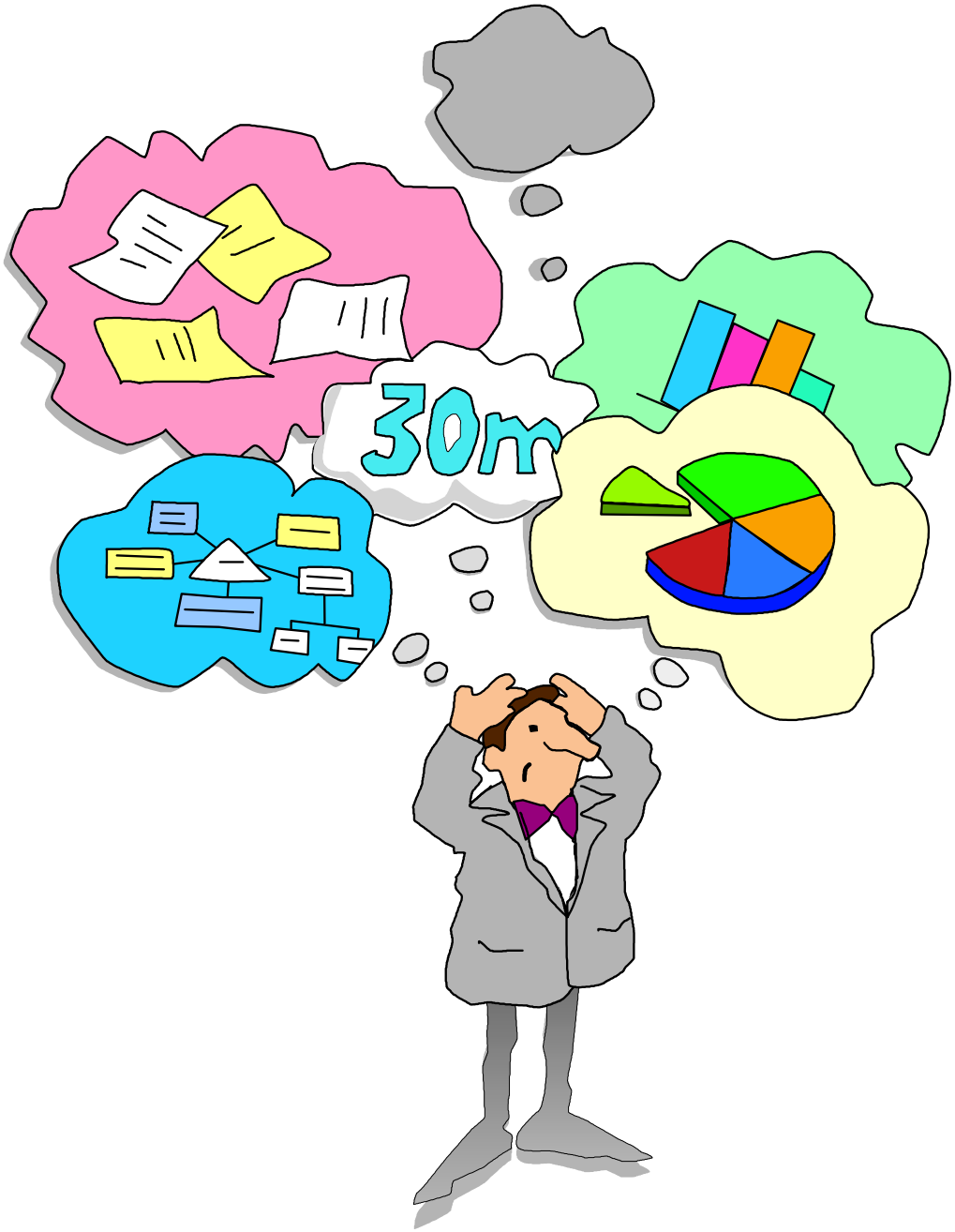
Questions?