



Architecture Skills: Critical Thinking

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- IT Architecture and Strategy
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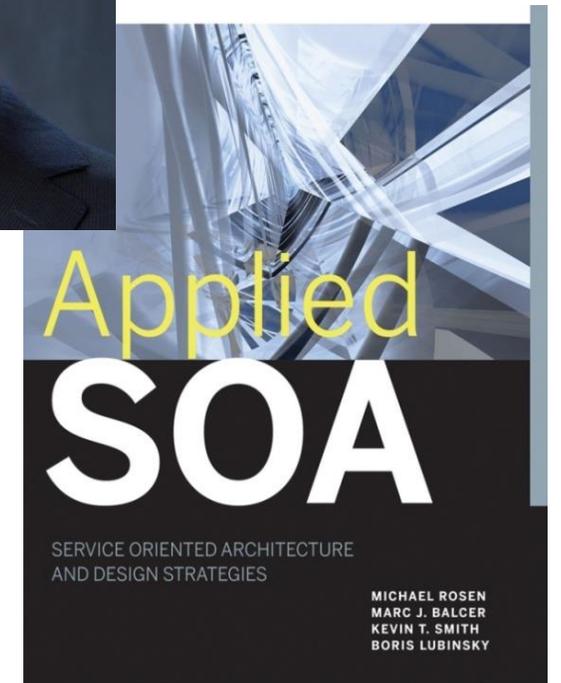
Author

- Orbus White Papers
 - *Coming in 2014*
 - Improving your Architecture Skills – Critical Thinking
 - Integrating Business Architecture and Business Process
 - Improving your Architecture Skills – Abstraction
- IDC CIO Agenda Research – EA for the 3rd Platform
- Cutter Consortium - Business and Enterprise Architecture
- Books
 - SOA Applied: Architecture and Design Strategies, 2008, Wiley
 - Developing e-Business Systems and Architecture: A Manager's Guide, 2000, Morgan-Kaufman
 - Integrating CORBA and COM Applications, 1998, Wiley

Thought Leadership

- Business Architecture Guild – VP, Founding Member, BIZBOK, EABOK, BABOK contributor
- Penn State Center for EA Education – Advisor Board; SOA Institute – Editorial Director
- Standards: OMG, The Open Group

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What does an Architect do?

- Architecture is a relatively new, and not well defined role
- Many people have an architect title, but aren't really architects
- Some are doing architecture, but don't have the title
- Few people seem to understand the role or skills of an architect
 - Architects themselves
 - Others in IT
- This presentation will illustrate architecture skills from the perspective of a project lifecycle
 - But, does not assume that all architects work in this context
 - Believes that these skills apply to all architecture domains

What is Architecture?

- Architecture is responsible for achieving commonality across the specific scope (e.g. enterprise) that is required to meet strategy and goals.
- Architecture consists of:
 - Requirements gathering
 - Determining the overall structure of the 'system'
 - Definition of what must be common for efficiency and consistency
 - Definition of what must be variable for differentiation and competition
 - Definition of how the variable parts fit within the common environment
 - Communications
 - Formal specification and documentation
 - Processes for integrating architecture into enterprise processes (strategy, portfolio management, design, development, procurement)
 - Project assistance (consulting)
 - Governance
 - Measurement, monitoring and improvements
- Architecture must achieve three primary goals:
 1. Describe a solution to a specific set of problems and requirements
 2. Effectively communicate the solution to all stakeholders
 3. Enable the creation of systems that conform to the architecture

Requirements Elicitation and Analysis

1. Inquire

- Get to the core of the problem
- Solicit both specific requirements and goals, as well as an understanding of how those requirements fit into a broader context
- Question assumptions that have been made, explicitly or implicitly

• Integrate

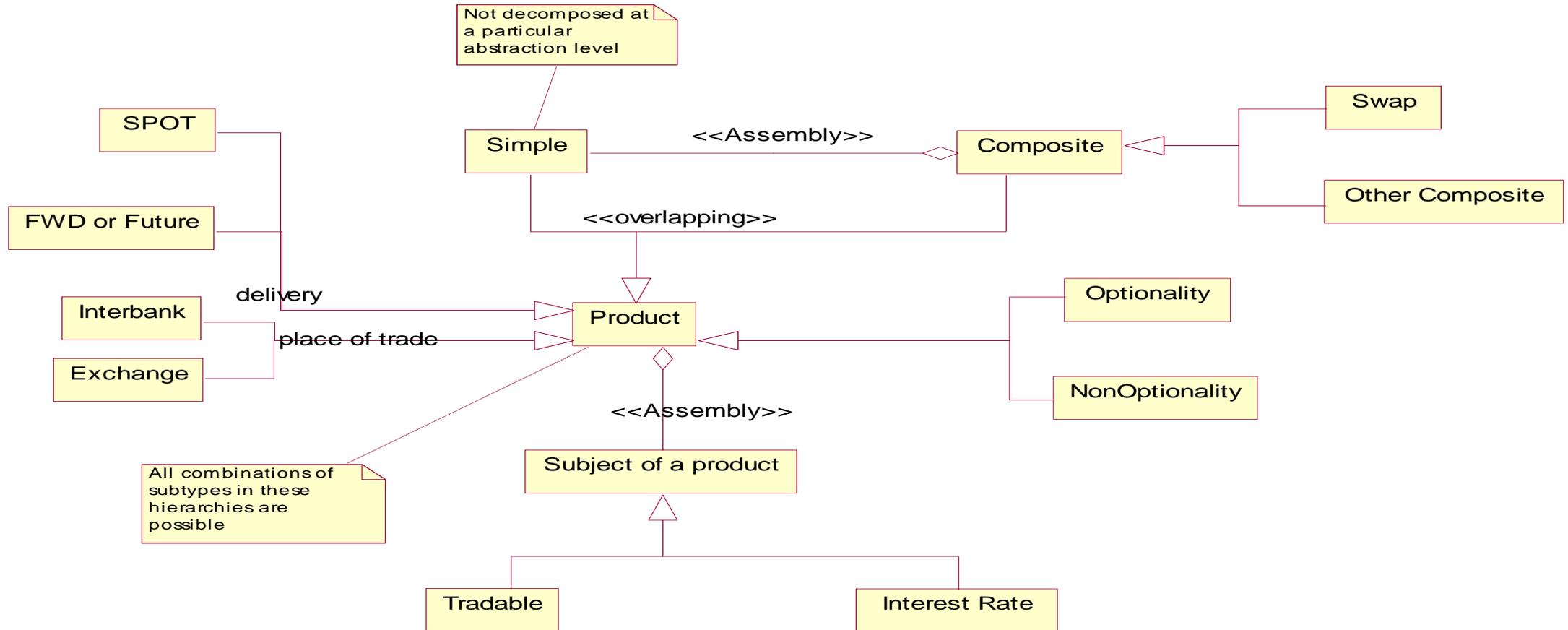
- Act as a bridge between a given project and how that project fits into the broader context
 - Business domain
 - Enterprise concerns
 - Industry standards
 - Established patterns
 - Best practices

1. Analyze

- Answers three architectural questions:
 1. What are the key elements of the problem or solution?
 2. What are the relationships between them?
 3. How do they combine together to meet requirements and provide value higher up?

Business Architecture - Concepts and Entities

Products



Solution Creation and Specification

4. Conceptualize

- Create a conceptual vision of the overall, integrated solution
- The conceptual architecture serves to communicate the overall concepts to a broad audience

5. Abstract

- Communicate the key details to specific audiences through the use of architectural viewpoints
- Abstraction can be defined as the suppression of irrelevant detail
- Within each perspective, the viewpoint will also be presented in different levels of abstraction, often referred to as “conceptual, logical and physical” architectures

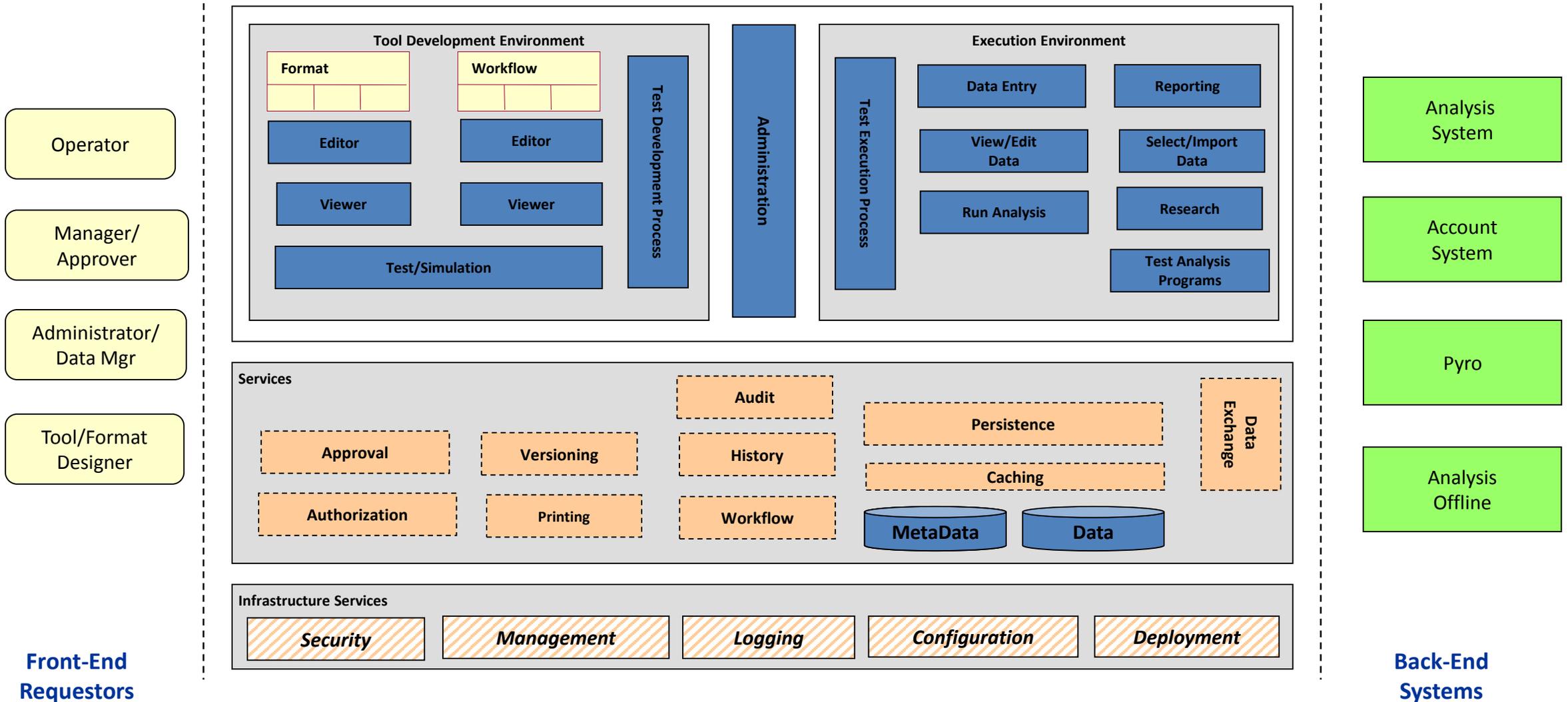
6. Visualize

- Create visual renditions of the different abstractions and viewpoints
- Drawings and Models

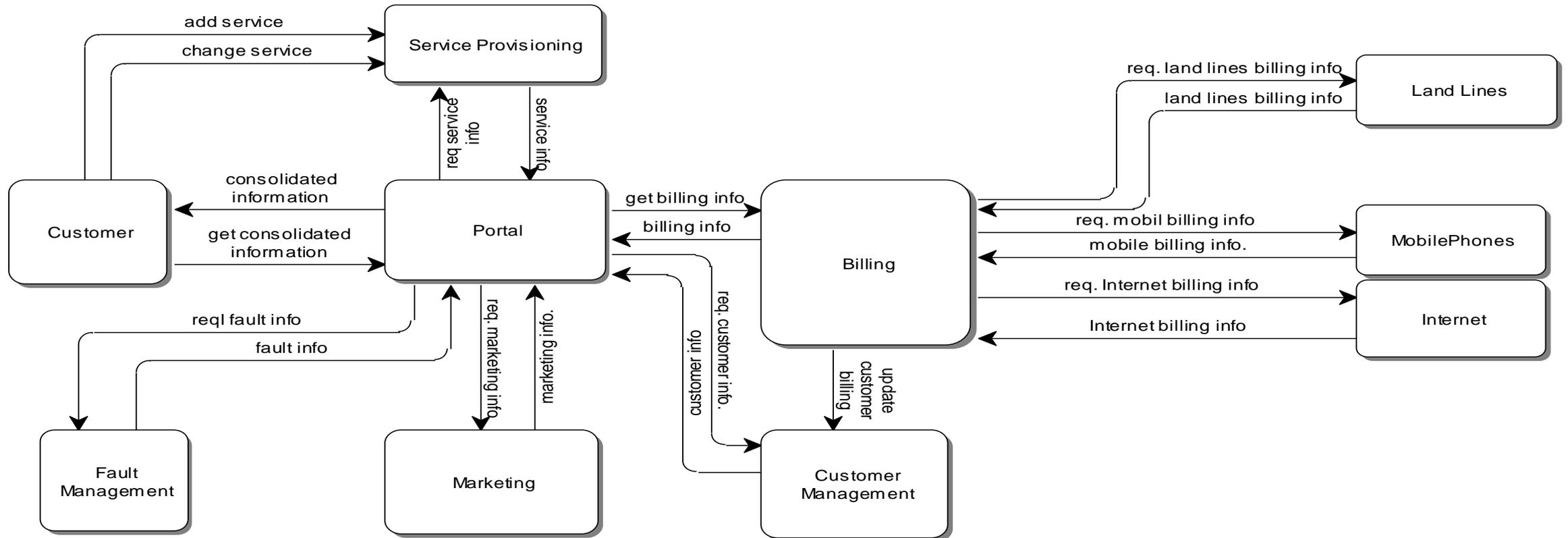
7. Formalize

- Unambiguously communicate the details of the architecture specification
- A complete and precise model, expressed in industry standard notation, may often be preferred to a document because a formal model can be implemented and enforced within a modeling tool or design framework

Pharma Conceptual Architecture

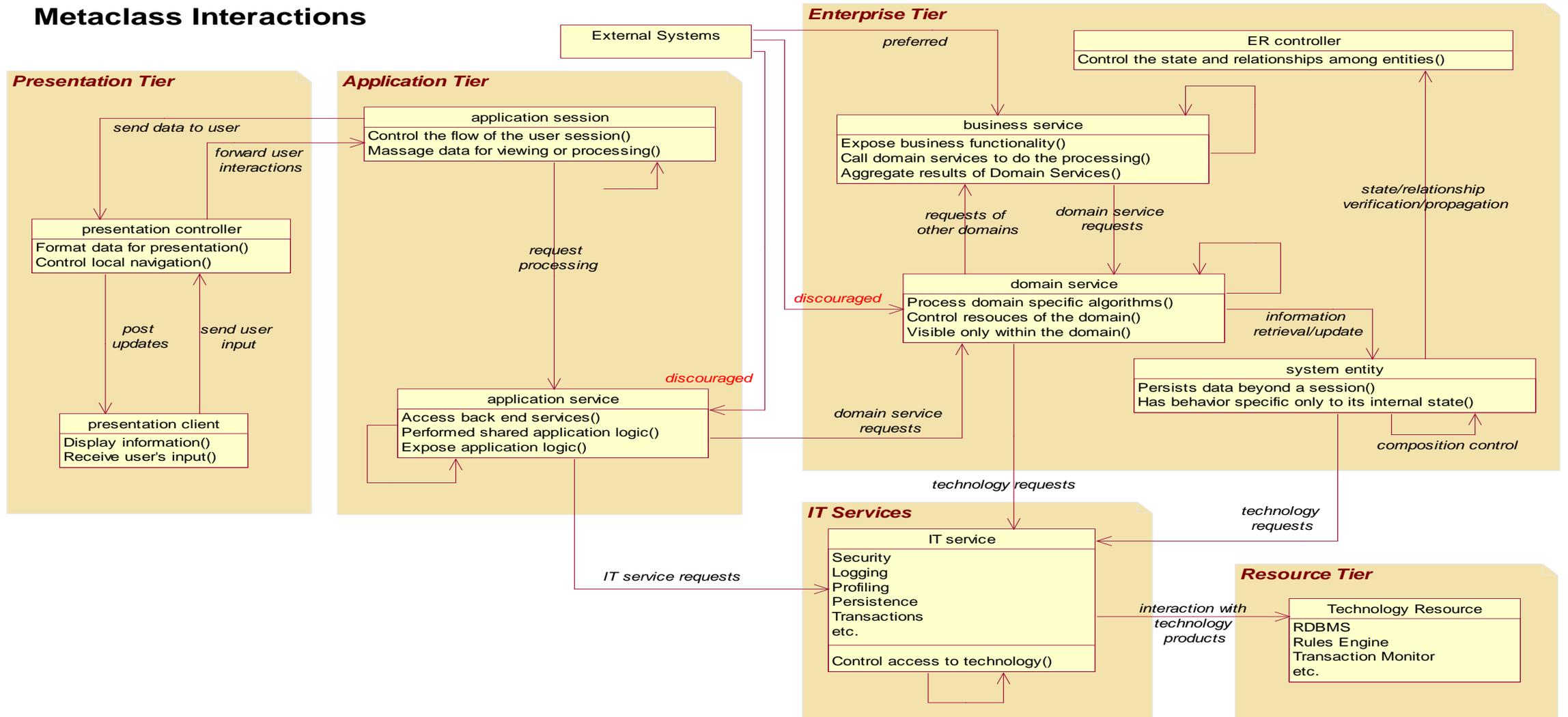


Abstraction -- Business Context Diagram



Formal Reference Architecture

Metaclass Interactions



Architectural Influence

8. Communicate

- The most important aspect of an architect's job
- After establishing and formalizing a solution, architects communicate that solution and value throughout the organization

9. Enable

- The equation for architecture value is actually pretty straightforward
 - If using architecture will make someone's job easier, they'll use it
 - If it adds extra steps without adding extra value, it will be ignored
- The key to architectural influence depends on the extent to which architects enable the target audience to easily use the architecture

10. Assist

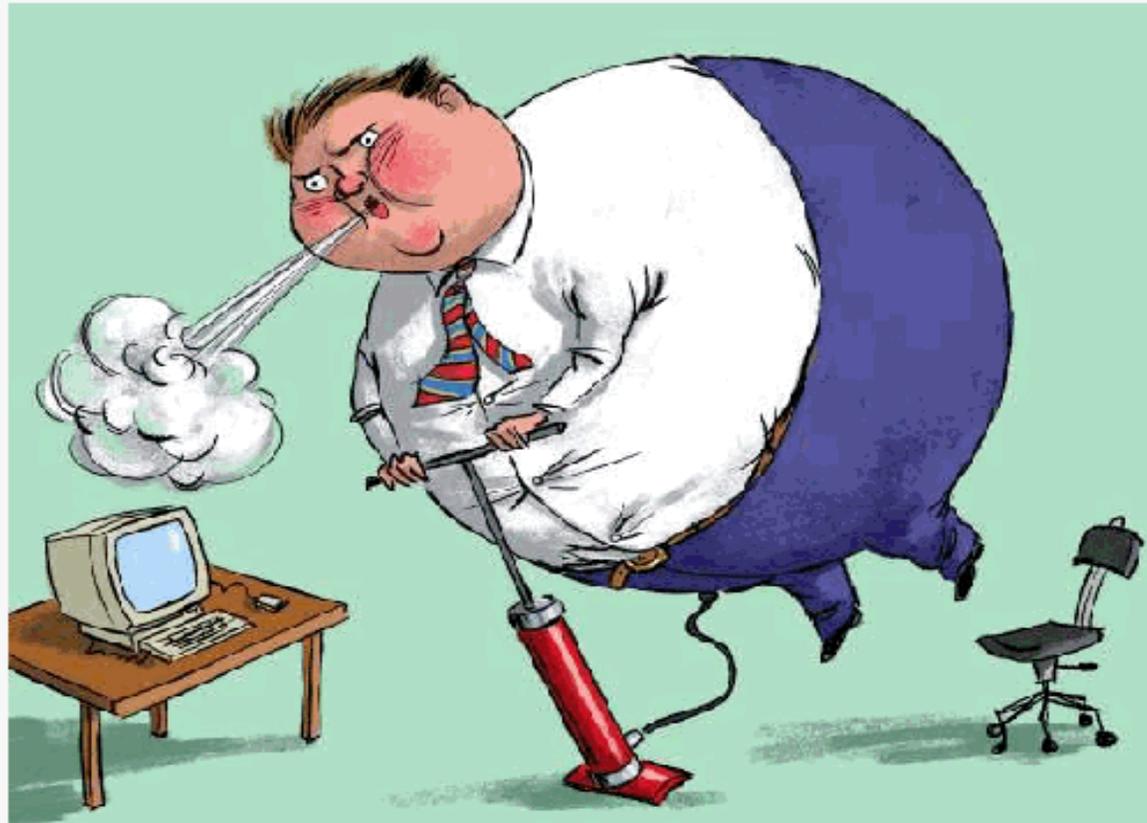
- The single most important activity an architect can do to make their architecture real
- Actively assist projects in using it
- But, remember your role is to *assist*

This Isn't You...

Sunday, December 03, 2006

Architects who don't code...

How can someone who never writes a line of code be responsible for how that code will be written?...



Critical Thinking

- Active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends.

**John Dewey, 1909*

- Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do.

**Norris and Ennis, 1989*

- “The intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action”.

**The National Council for Excellence in Critical Thinking*

**<http://www.criticalthinking.org/pages/defining-critical-thinking/766>*

Critical Thinking

- An individual or group engaged in critical thinking considers:
 - Evidence through observation
 - Context
 - Relevant criteria for making the judgment
 - Applicable methods or techniques for forming the judgment
 - Applicable theoretical constructs for understanding the problem and the question at hand

Critical Thinking Requires the Ability to...

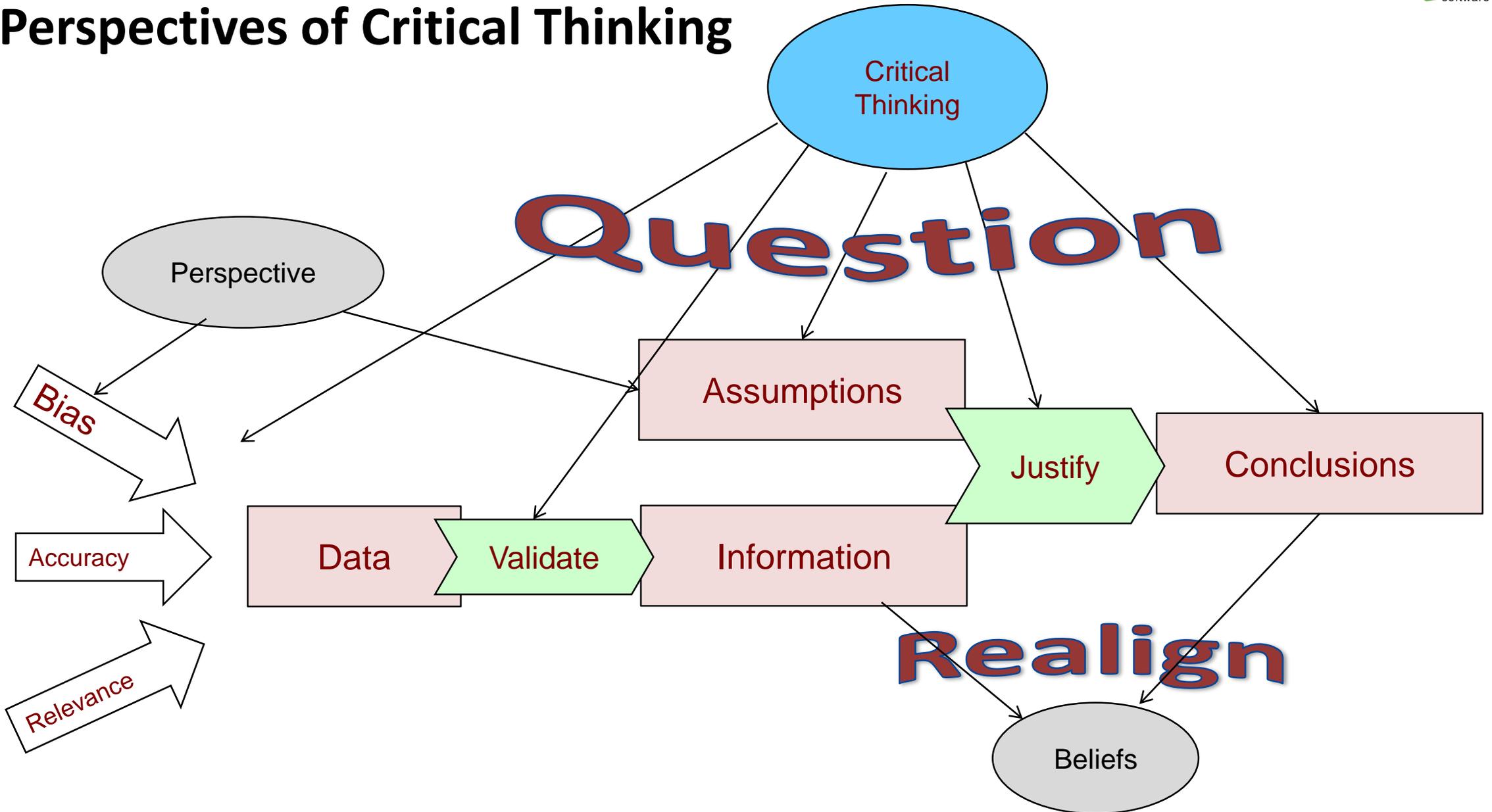
- Recognize problems
- Understand the importance of prioritization and order of precedence in problem solving
- Gather relevant information
- Recognize and question unstated assumptions and values
- Comprehend and use language with accuracy and clarity
- Interpret data to appraise evidence and evaluate arguments
- Recognize the existence (or non-existence) of logical relationships between propositions
- Draw warranted conclusions and generalizations
- Put to test the conclusions
- Adjust one's beliefs on the basis of wider experience

* *Glaser, 1941*

Critical Thinking Should Question

- Goals, purpose, objectives – to make sure that discussions are relevant to meeting them
- The way in which questions are framed, problems posed, issues expressed – to expose underlying beliefs
- Information and sources of information – to ascertain accuracy, providence, and impartiality
- Assumptions being made – to understand both implicit and explicit perspectives and requirements
- Concepts being used – to determine acceptability and applicability
- Perspectives or points of view – to understand semantics and biases
- Implications of assumptions, concepts, and perspectives – to identify dependencies and priorities
- Interpretations and conclusions – to validate against the evidence

Perspectives of Critical Thinking



Critical Thinking Example

- Problem Scenario:
 - An organization provides business services to a variety of public entities (city, county, state, etc.)
 - Currently each customer has their own set of processes and data.
 - Sub-units within a customer also have their own processes and data.
- Problem Statement:
 - The organization is modernizing and re-engineering the business services into a product set.
 - The product set needs to support flexibility for customers.
- Question:
 - What are the requirements for flexibility?
 - What assumptions should be questioned?

Realigns One's Own Beliefs

- A key aspect of critical thinking is to draw conclusions based on the evidence
- These conclusions and beliefs are based on the evidence available at the time
- As new evidence is discovered, or a wider experience or broader context is applied, or as previous assumptions and beliefs are challenged, we have to be able to adjust our own preconceived beliefs
- This is what we are asking of our stakeholders, so we better be able to do it for ourselves
- I consider this one of the key characteristics of a good architect
- It takes a combination of open mindedness, fact based reasoning, and self confidence to evolve one's belief systems

A Well-Skilled Architect ...

- Raises important questions and problems, formulating them clearly and precisely.
- Questions assumptions.
- Gathers and assesses relevant information, using abstraction to consolidate and interpret
- Comes to well-reasoned conclusions and solutions, testing them against relevant criteria, requirements, standards, and best practices
- Thinks open-mindedly, recognizing and assessing their assumptions, implications, and consequences
- Communicates effectively with others in arriving at solutions to complex problems, without being unduly influenced by preconceived notions or other's opinions

Food for Thought

- Does the 'Well Skilled Architect' describe how you'd like to be described? Your aspirations for performance?
- Can you see where the concepts and skills discussed here would be a useful foundation?

Any Questions?



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Download this presentation and accompanying white paper from:
www.orbussoftware.com/downloads