

A large, 3D-rendered globe made of interlocking puzzle pieces. The globe is the central focus of the slide, with a soft glow around it. The puzzle pieces are a light tan color with dark outlines. The globe is set against a light blue background with a subtle grid pattern.

IT Architect Regional Conference 2007

Good Architecture Descriptions Are Explosive

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Presentation Outline

1. The Case for Communication
2. C4 is Explosive
3. Views of the Architecture Description
4. Summary



The Case For Communication

- ❑ Communication is one of the most important skills for the Software Architect

- ❑ Essential competencies:
 - ❑ Understand stakeholder needs
 - ❑ Ensure the stakeholders understand the capabilities and limitations of the architecture
 - ❑ Gain consensus on approach through diplomacy, compromise, and mediation

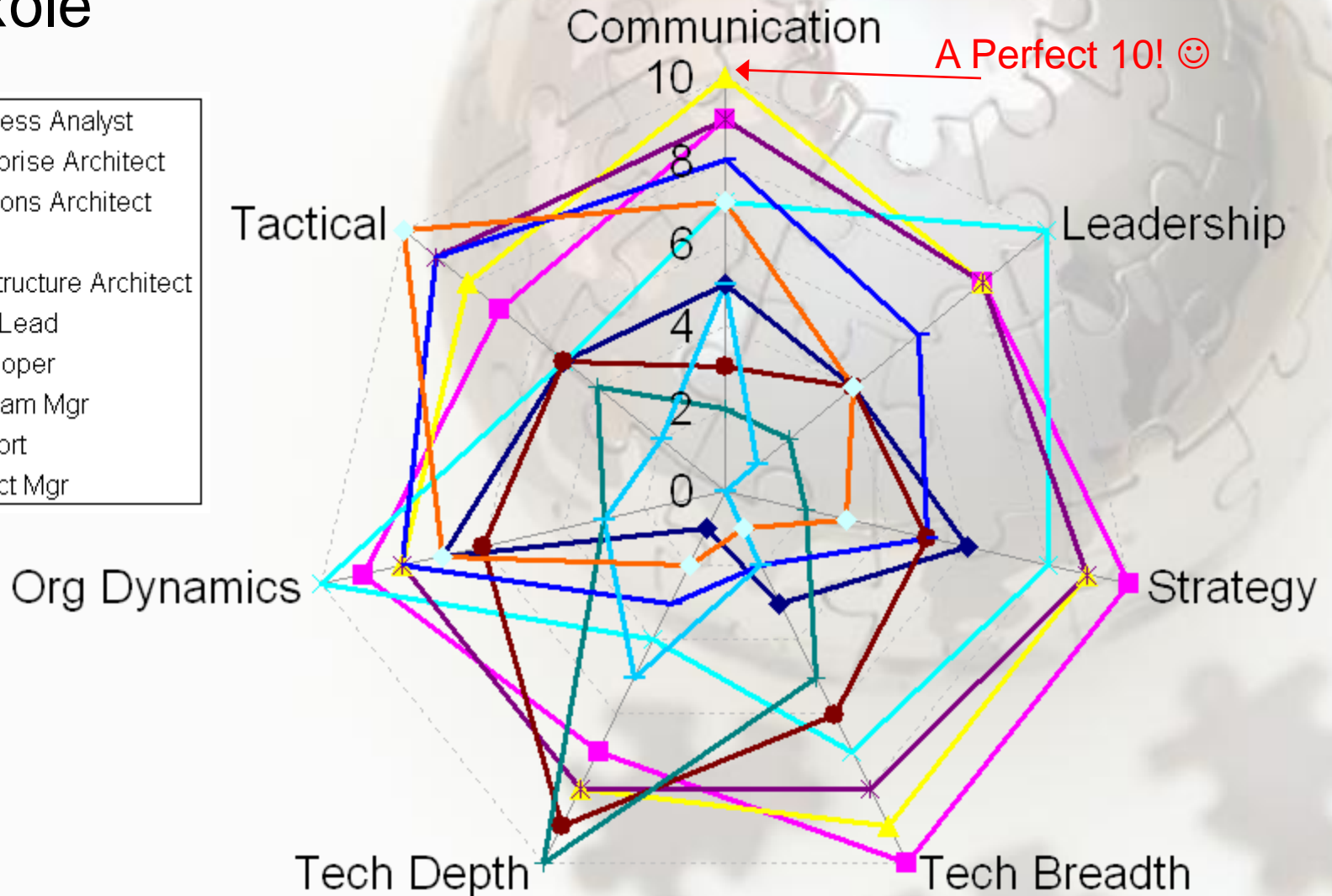
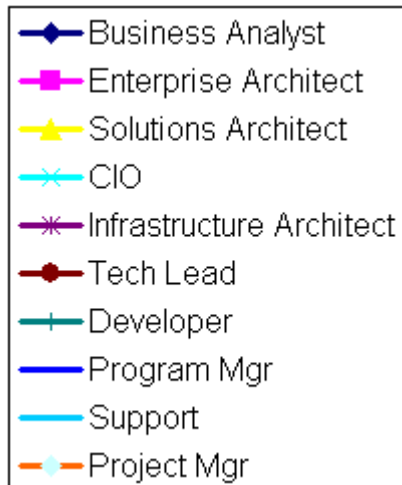
MCA Communication Competency

Candidates demonstrate that they maintain well-written and accurate project documentation, and that they can present information about a technical subject in a concise and measured manner. Candidates are able to influence others, they manage conflict effectively, and they customize their communication to the needs of the target audience.

MCA Communication Competency Skills

- ❑ Effective listener and astute observer
- ❑ Communicate effectively and persuasively to different audiences (for example, executive or technical)
- ❑ Effectively mediate and manage conflict
- ❑ Document designs and specifications that follow company practices
- ❑ Communicate infrastructure constraints as well as security audit and compliance requirements to solutions architects
- ❑ Communicate needs as well as deployment and operations standards to infrastructure architects
- ❑ Effectively facilitate meetings
- ❑ Possess good presentation skills

MCA Competencies By Role



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The 4 C's - Explosive

- ❑ **Correct**

 - Accurate content describing the right architecture

- ❑ **Clear**

 - Easily understood and meaningful to the stakeholders

- ❑ **Concise**

 - Includes only the architecturally significant content

- ❑ **Comprehensive**

 - Addresses the true breadth of architectural concerns

C4 - Correct

- ❑ Accurate content describing the right architecture
- ❑ “Right Architecture” includes making sure we’re solving the right problems – the problems that need to be solved.

C4 - Correct

- ❑ Create effective models that illustrate:
 - ❑ Needs and concerns of the stakeholders
 - ❑ Mapping into the solution space



Get Feedback

- ❑ "Models are not right or wrong, they are more or less useful."

(Martin Fowler, Analysis Patterns)

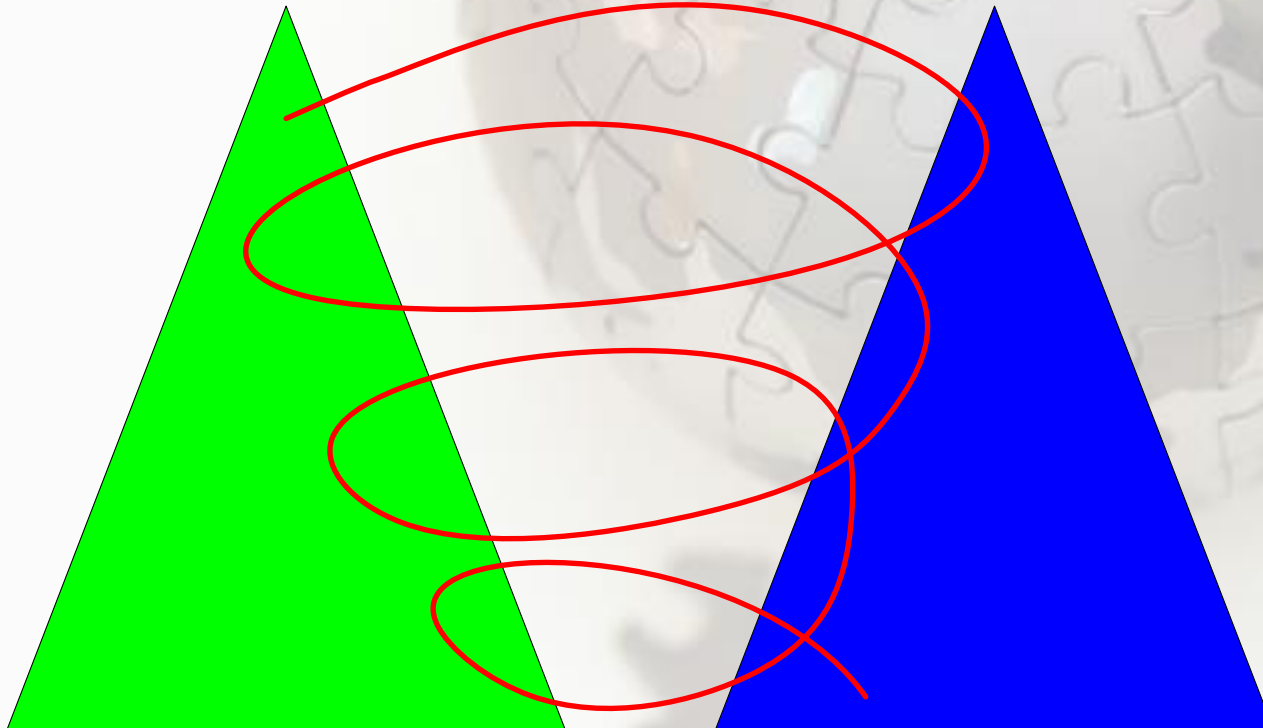
- ❑ "Every architectural model is an approximation of reality. In other words, it is only partially accurate and partially complete."

(Rozanski and Woods, Software Systems Arch)

Encourage Practical Validation

Problem Space

Solution Space



C4 - Clear

- ❑ Establish business and technical context
- ❑ Clear and straightforward language
- ❑ Tailor the content, language, and detail to the audience's skills and experience.

C4 - Clear

- ❑ Organized and structured in a manner that promotes the ability of each stakeholder to understand the relevant parts
- ❑ Multiple concurrent views addressing unique stakeholder concerns (4+1, etc)

C4 - Clear

“When dealing with people, remember you are not dealing with creatures of logic, but creatures of emotion.”

(Dale Carnegie)



bored



contempt



admiring



amused



disappointed

C4 - Concise

- ❑ Careful calibration of detail fine-tunes clarity and encourages correctness
- ❑ Think 80/20 rule - Pareto Principle
- ❑ Manages maintenance cost and encourages accuracy

C4 - Concise

- ❑ Focus on the “architecturally significant”
- ❑ “An architecturally significant element has a wide impact on the structure of the system and on its performance, robustness, evolvability, and scalability. It is an element that is important for understanding the system.”

C4 - Concise

- ❑ Architecturally significant elements include:
 - ❑ Major classes, especially major business entities
 - ❑ Architectural mechanisms that guide and predict behavior (e.g., persistence and communications frameworks)
 - ❑ Patterns and frameworks
 - ❑ Layers and subsystems
 - ❑ Interfaces/Contracts
 - ❑ Major processes or threads of control

C4 - Concise

“Noise proves nothing. Often a hen who has laid an egg cackles as if she had laid an asteroid.”

(Mark Twain)



C4 - Comprehensive

- ❑ Full breadth of business and technical concerns
- ❑ Be sure to enlist appropriate stakeholders
 - ❑ Not just technical!
- ❑ Ask questions, be proactive, and look for the “requirements behind the requirements”

C4 - Comprehensive

❑ Stakeholders

- ❑ Assessors/Auditors
- ❑ Business Owner
- ❑ Developers
- ❑ Maintainers
- ❑ Marketing
- ❑ Operations and Support staff
- ❑ System Administrators
- ❑ Testers
- ❑ Users



C4 - Comprehensive

**“I remind myself every morning:
Nothing I say this day will teach me
anything. So if I'm going to learn, I
must do it by listening.”**

(Larry King)

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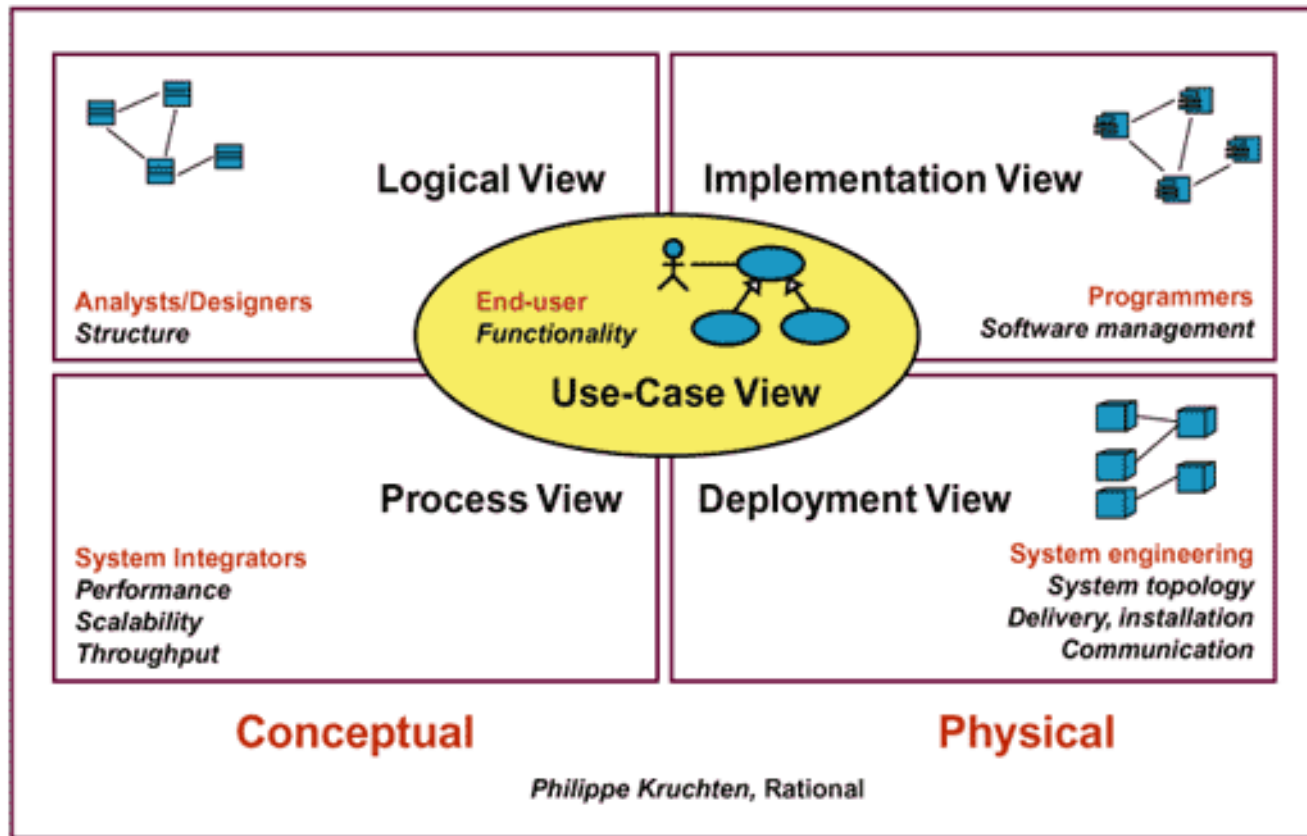
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Using Multiple Views

- ❑ Using a single architectural model will generally fail to satisfy the C4 objectives
 - ❑ Complicated and hard to understand
 - ❑ Ambiguous language for many stakeholders
 - ❑ Incomplete and incorrect
- ❑ Solution: Use multiple views address relevant and specific concerns
- ❑ Promoted by many, including Philippe Kruchten and Rational (4+1)
- ❑ Formalized somewhat by IEEE 1471 in 2000

Kruchten: 4+1 Views of Architecture



Kruchten: 4+1 Views of Architecture

- ❑ **Logical (Design) View** – Elements of the software and their structure: classes, packages, etc.
- ❑ **Process (Concurrency) View** – Parallelism between various entities and how communication and synchronization are achieved.
- ❑ **Implementation (Development) View** – Organization of implementation elements (source code, executables, etc) in the development environment.
- ❑ **Deployment (Physical) View** – Physical deployment of runtime components and how they communicate.
- ❑ **Use-Case (Requirements) View** – Most significant requirements (functional and non-functional) and the way they're “realized” in the architecture.

Logical View

- ❑ Primarily supports the functional requirements – what the system should do in terms of service to its users
- ❑ Describes the functional elements, their responsibilities, interfaces, and primary interactions

Development View

- ❑ Subsystem decomposition – software module organization
- ❑ Supports the software development capability and process
- ❑ Frequently supports allocation of work and organization of teams

Process View

- ❑ Process decomposition and the concurrency structure of the system
- ❑ Mapping of logical elements and abstractions to concurrency units
- ❑ Coordination, scheduling, and synchronization
- ❑ Influential in the fault-tolerance strategy

Deployment View

- ❑ Mapping the software to the hardware
- ❑ Processing nodes, network interconnections, disk storage, etc
- ❑ Critical to non-functional requirements of the system such as availability, reliability, performance, and scalability.

Use-Case View

- ❑ The elements in the four views are shown to work together seamlessly by the use of a small set of important *scenarios*
- ❑ Redundant with the other views (hence the “+1”), but serves two main purposes:
 - ❑ A driver to discover the architectural elements
 - ❑ A lens for illustration, deliberation, and validation

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Summary

- ❑ Communication is one of the most important skills of the Software Architect
- ❑ Good communication is 2-way
- ❑ The Architecture Description is a powerful communication tool

Summary: The 4 C's

- ❑ **Correct**

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Summary: Multiple Views

- ❑ Use multiple views to address specific stakeholder concerns
- ❑ Tailor the content, language, and detail to the audience's skills and experience

**It's not the same to talk of
bulls as to be in the bullring**

(Spanish Proverb)

