A Collection of Viewpoints

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Abstract

See next slide

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Abstract

A system architect works by looking at the problem and solution from many different viewpoints, the so-called ”viewpoint hopping”. A collection of viewpoints is given, based on heuristics in product development of electronic systems, ranging from integrated circuits to wafersteppers and MRI scanners.

The focus is on the higher level viewpoints. The more detailed conceptual and realization viewpoints are not shown here.

This document is created for the WICSA workshop on ”Architectural Viewpoints”. The mindset of this workshop is strongly driven by the IEEE 1471 definitions. No attempt has been made yet to map the collected viewpoints on the IEEE ontology.

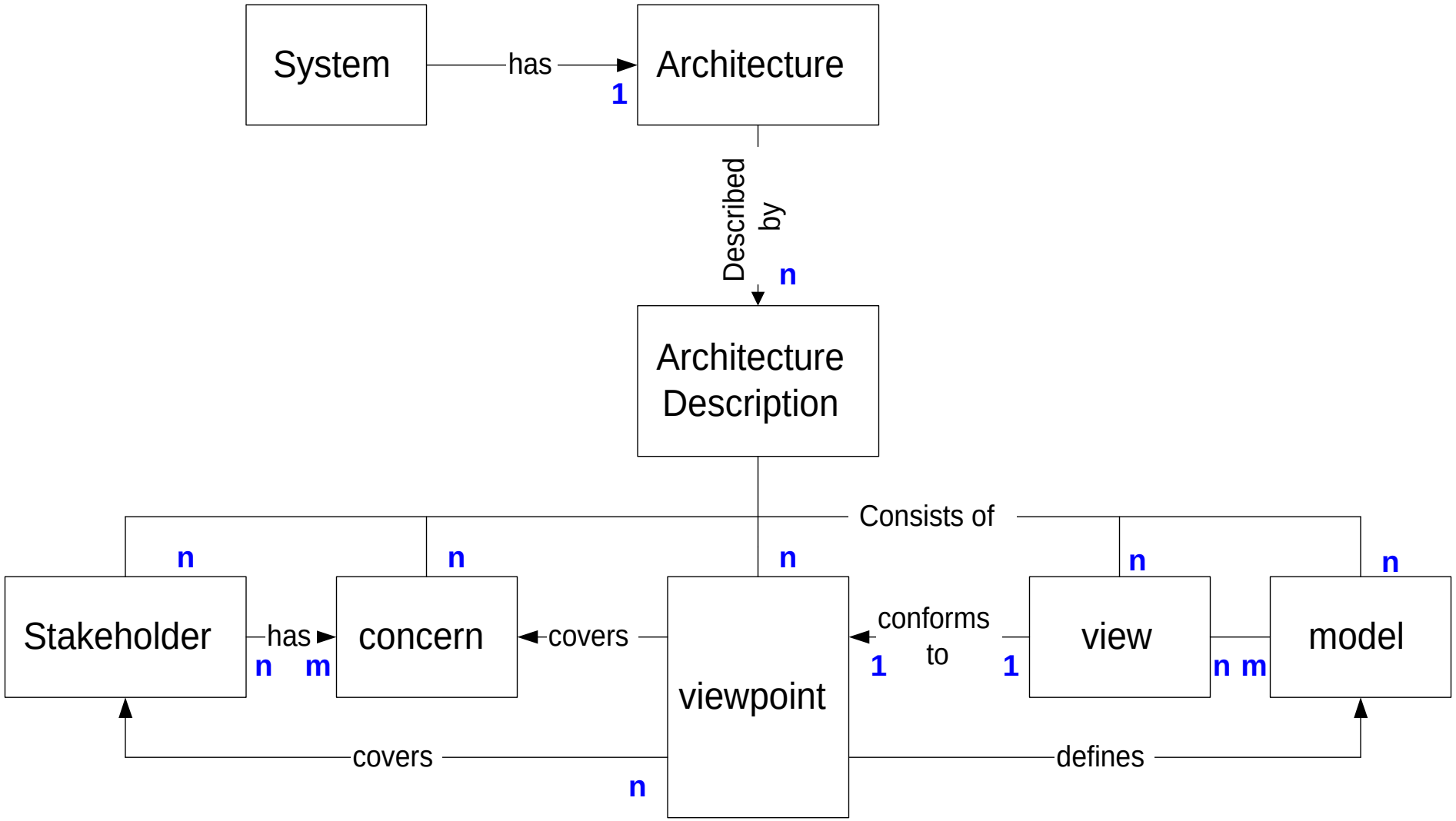
WICSA workshop questions

- Are there architectural description issues that don't fit with the IEEE 1471 ontology of stakeholders, concerns, views and viewpoints?
- What methods are there for checking consistency BETWEEN views? How do viewpoint definitions help with consistency checking and view integration?
- What kinds of architectural knowledge about a system fall "outside" of any particular viewpoint?
- Where do we go from here? What next steps should we take? A workshop proceedings or summary? Article? Future meetings? A viewpoint library or handbook?

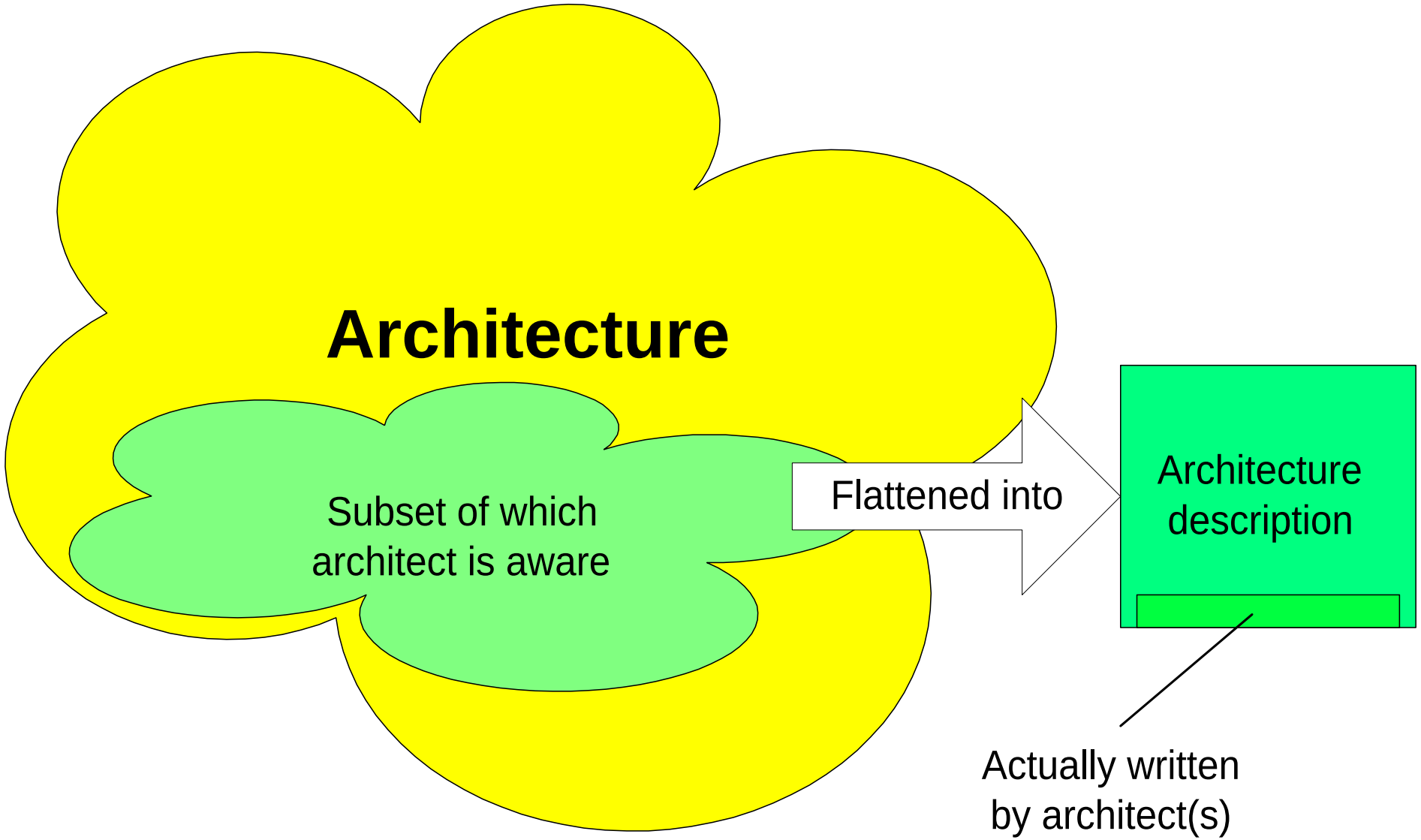
WICSA workshop submitted viewpoints

- attribute/decision
- behavior
- conceptual
- feature
- implementation
- logical
- model
- operational
- pattern-composition
- requirements
- resource
- test
- **system architect**

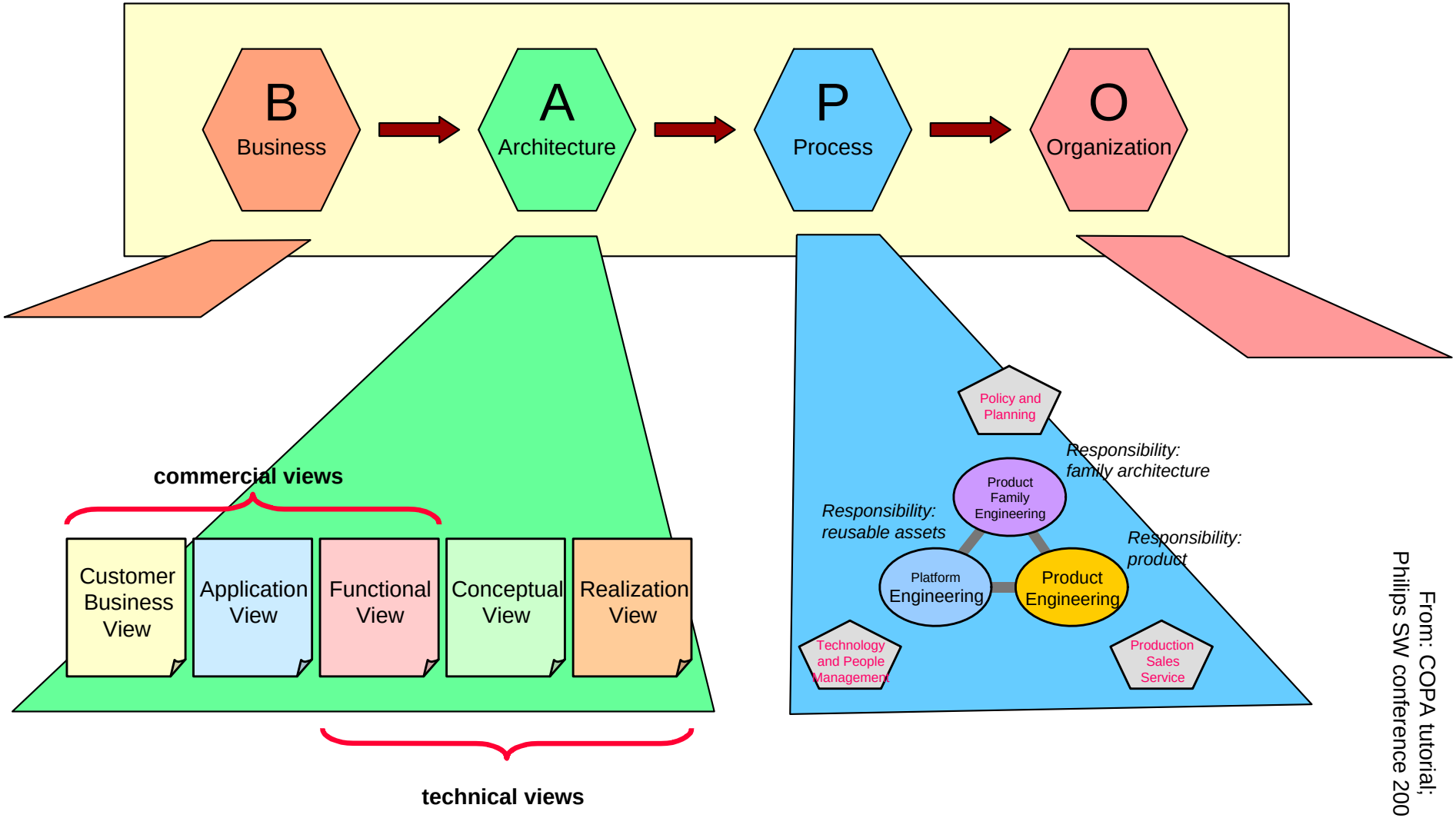
IEEE 1471 Architecture Description Standard



Flattening an Architecture into a Description



”BOPA” and ”CAFCR” framework



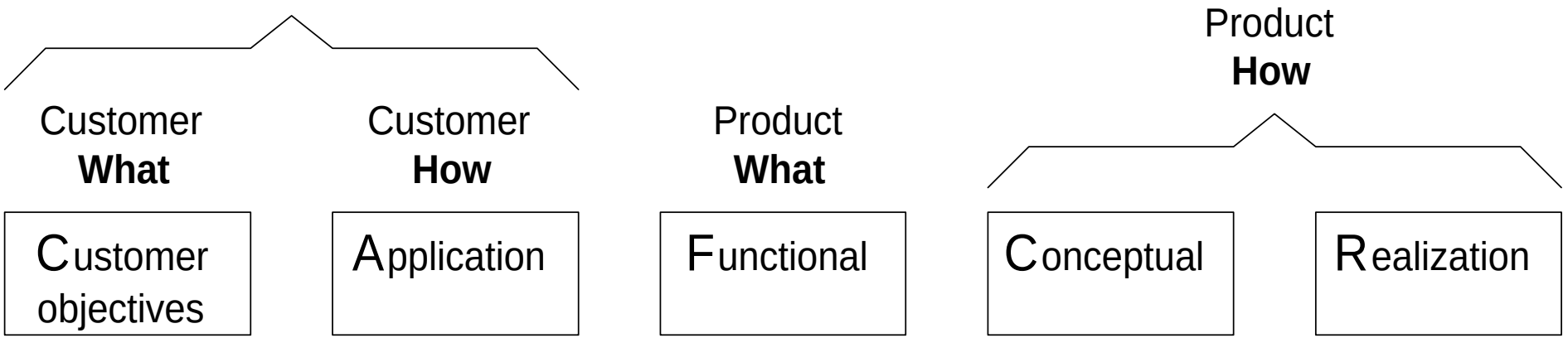
Architectural Framework

Process Framework

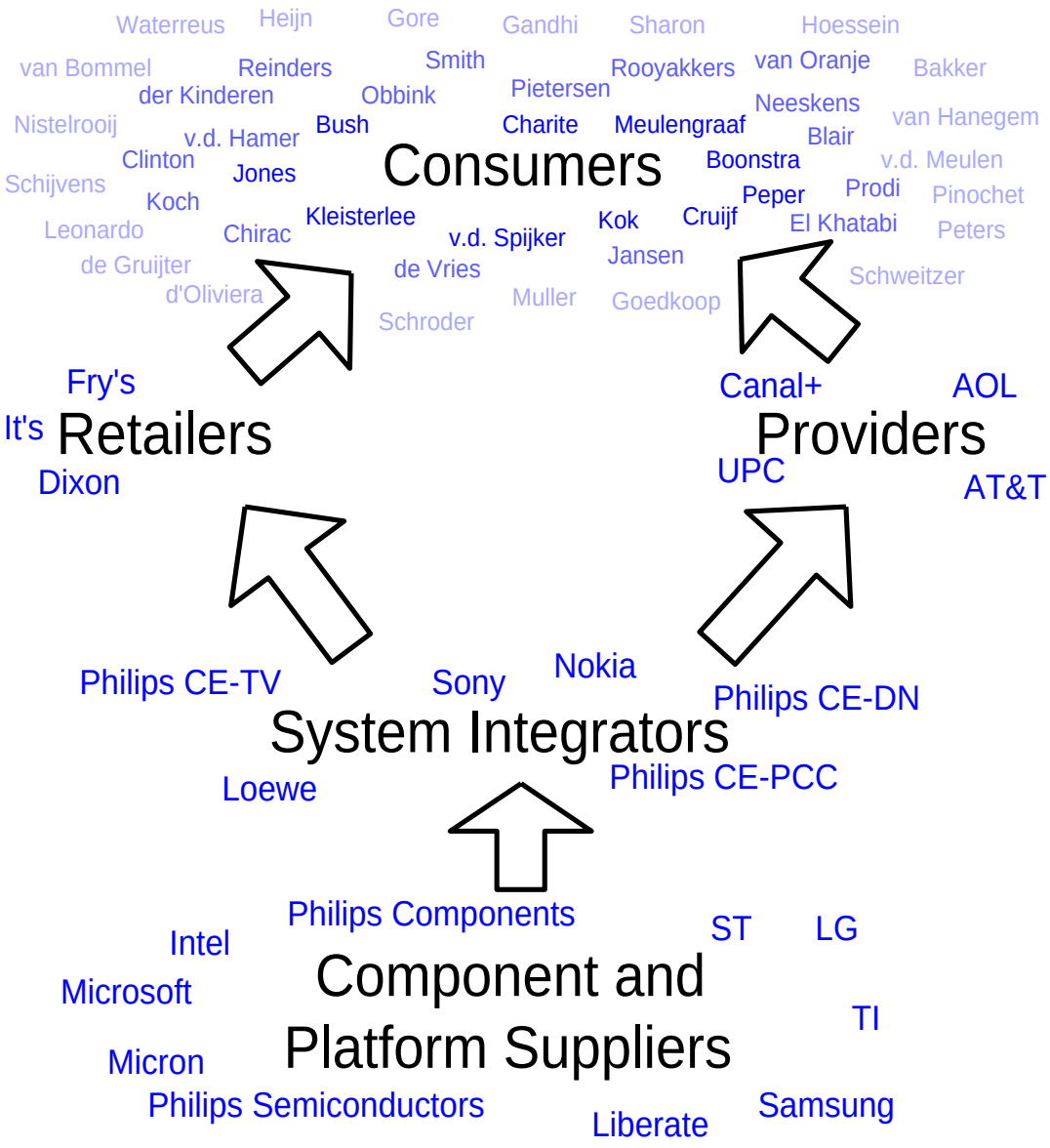
From: COPA tutorial; Philips SW conference 2001.

CAFCR

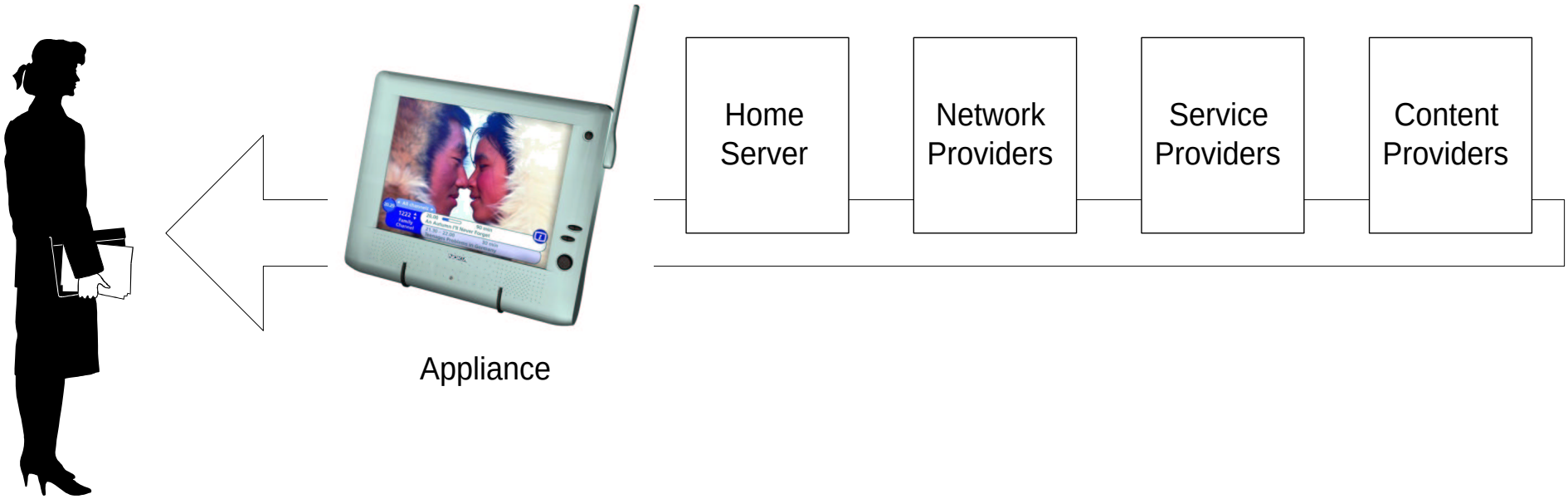
What does Customer need in Product and **Why**?



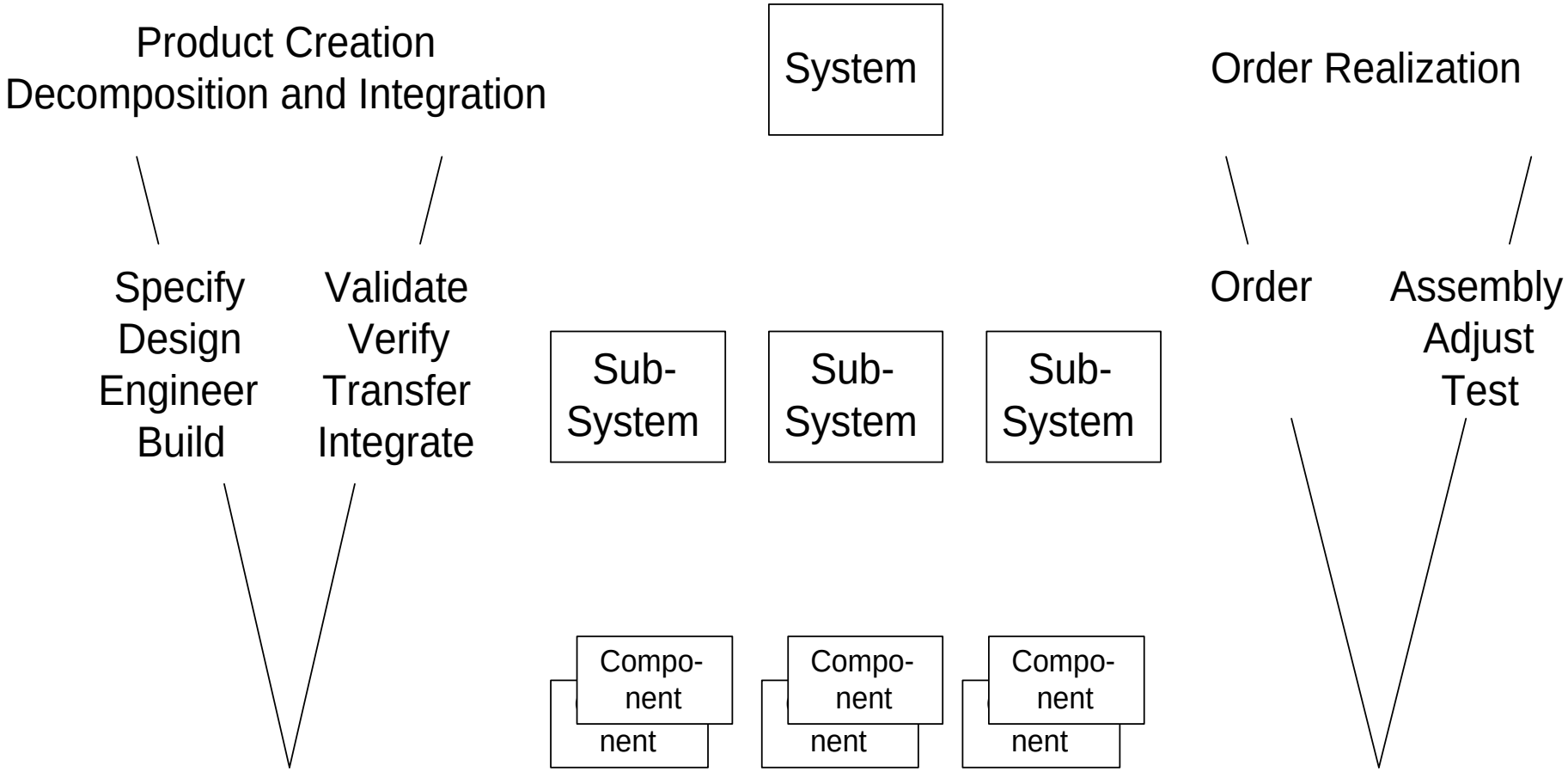
Value Chain semiconductors



Value Chain providers



Internal Value Chain



Stakeholders

Customer Stakeholders:

Consumer
User
Operator

Financial manager
Department manager
CEO
Purchasing manager

Support department
Quality Assurance officer

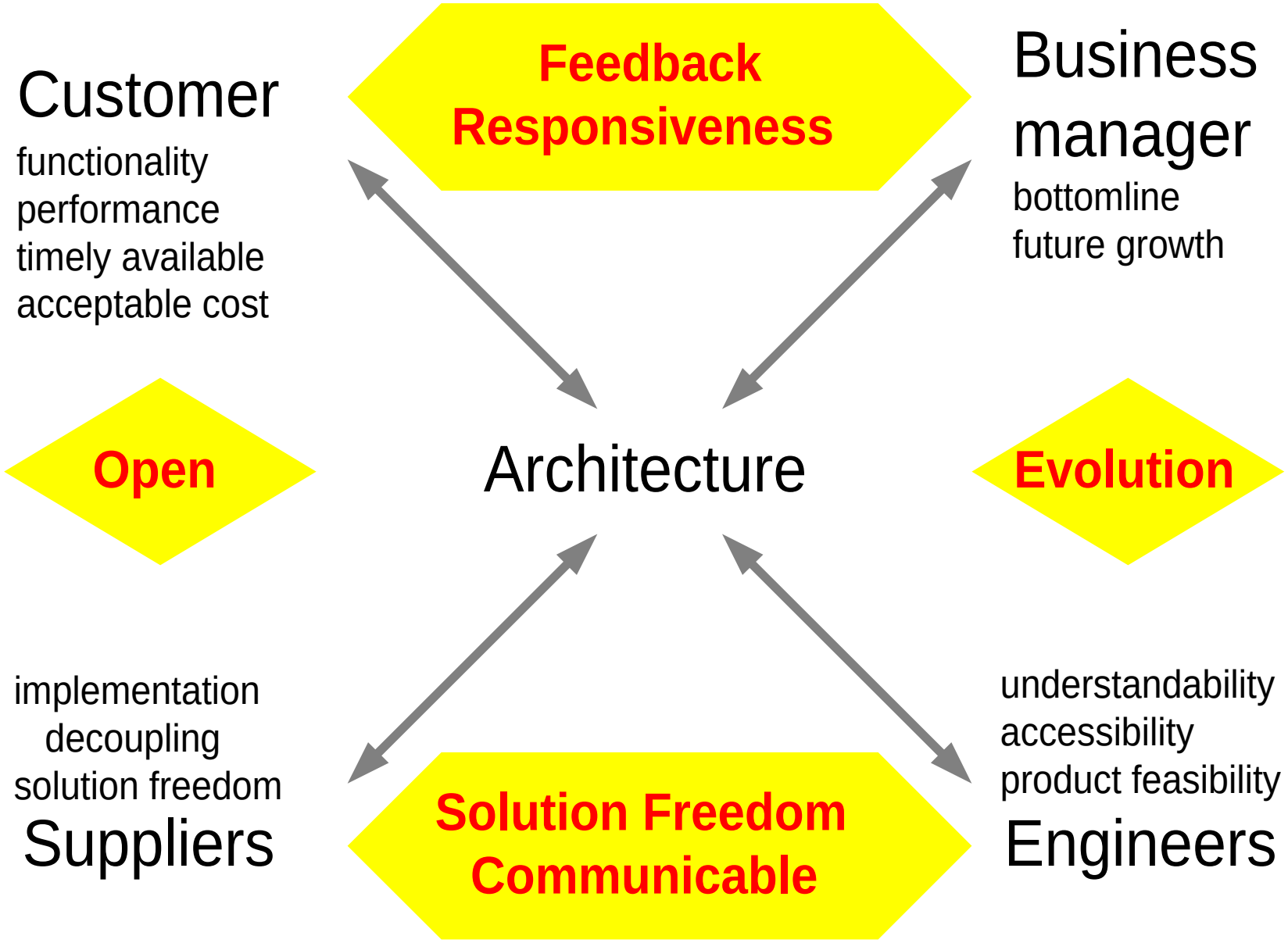
Service provider
Infrastructure provider
Content provider
Retailer
System Integrator / Solution Provider

Operational Stakeholders:

Sales manager
Field service engineer
Marketing manager
Application specialist

Portfolio manager
Project manager
Manufacturing engineer
Logistics manager
Purchasing manager
Quality Assurance officer
Line manager
Developer
Test engineer

Stakeholders of an Architecture



”Quality” Concerns

Performance

Safety
Security
Reliability
Robustness
Useability
Appeal, Appearance
Throughput or Productivity
Response Time
Image Quality
Reproduceability
Predicatability
Accuracy
Transportability
Wearability
Storability

Operational

Manufacturability
Testability
Serviceability
Configurability
Installability
Evolvability
Portability
Upgradeability
Extendability
Maintainability
Logistics flexibility
Lead time
Standards Compliance

Economics and Environment

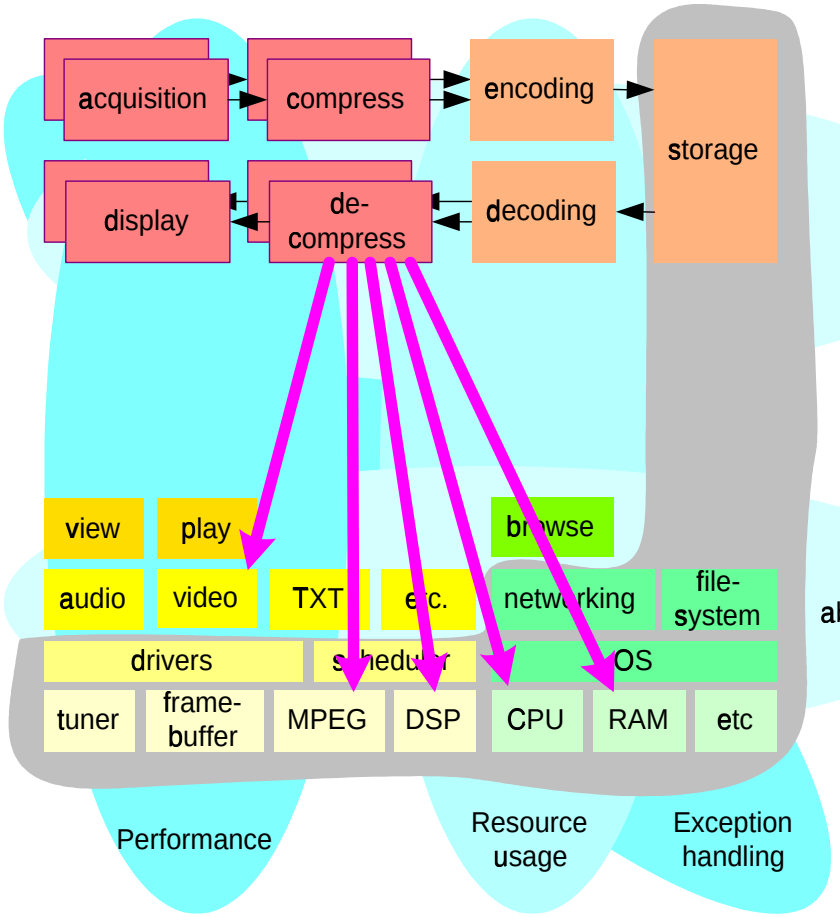
Cost price
Cost of operation
Interaction with environment
Power consumption
Consumption rate (water, air, chemicals, etcetera)
Disposability
Size, weight
Resource utilization

Guiding How

1. Functional Decomposition

3. Allocation

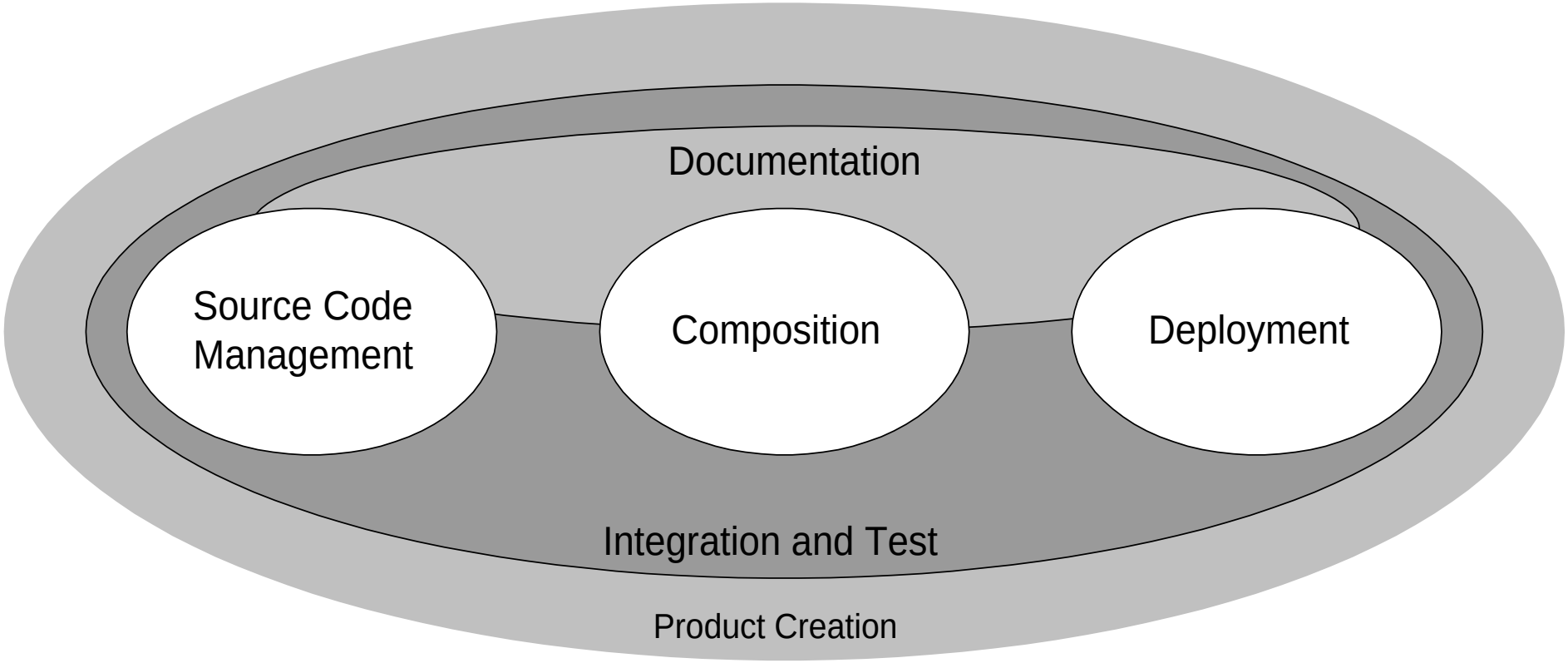
2. Construction Decomposition



4. Infra-structure

5. Choice of integrating concepts

Aggregation Levels



My (System Architect) viewpoint

- Integrating all viewpoints
- Balancing
- Providing focus, by selecting the most relevant viewpoints
- Identify risks, by monitoring the non selected viewpoints
- Bridging the stakeholder worlds
- Providing overview

A method to Integrate CAFCR viewpoints

Customer business	Application	Functional	Conceptual	Realization
Scenario:		Typical Case:	Models	Technical estimates
Accessible story, clearly outlining a **frequently** occuring situation with a **valuable** , but **challenging** solution		Functions and Quantification of **frequently** occuring **important** and **critical** case	Functional and Performance	

Several iterations are required. In later iterations worst cases and exceptional cases are taken into account. The technical estimates are then transformed in budgets.

Gaudí relevant URL's

- *Multi-view Architecting.* Presentation dec 12th 2000 in Eindhoven. http://www.extra.research.philips.com/natlab/sysarch/TheIndustreeDecember2000Slides.pdf
- *The Gaudi Project.* http://www.extra.research.philips.com/natlab/sysarch/GaudiProject.html
- *The Gaudi Documents.* http://www.extra.research.philips.com/natlab/sysarch/index.html