From Techno-nerd to Stakeholder Representative

by Gerrit Muller

Philips Research IST - SWA - IA

Abstract

Architects in the high-tech world are from origin often splendid technologists. Breadth of know-how enables them to design technically balanced systems. Unfortunately not every technically balanced system is also good and useable. Design for useability requires quite some context know-how especially application know-how.

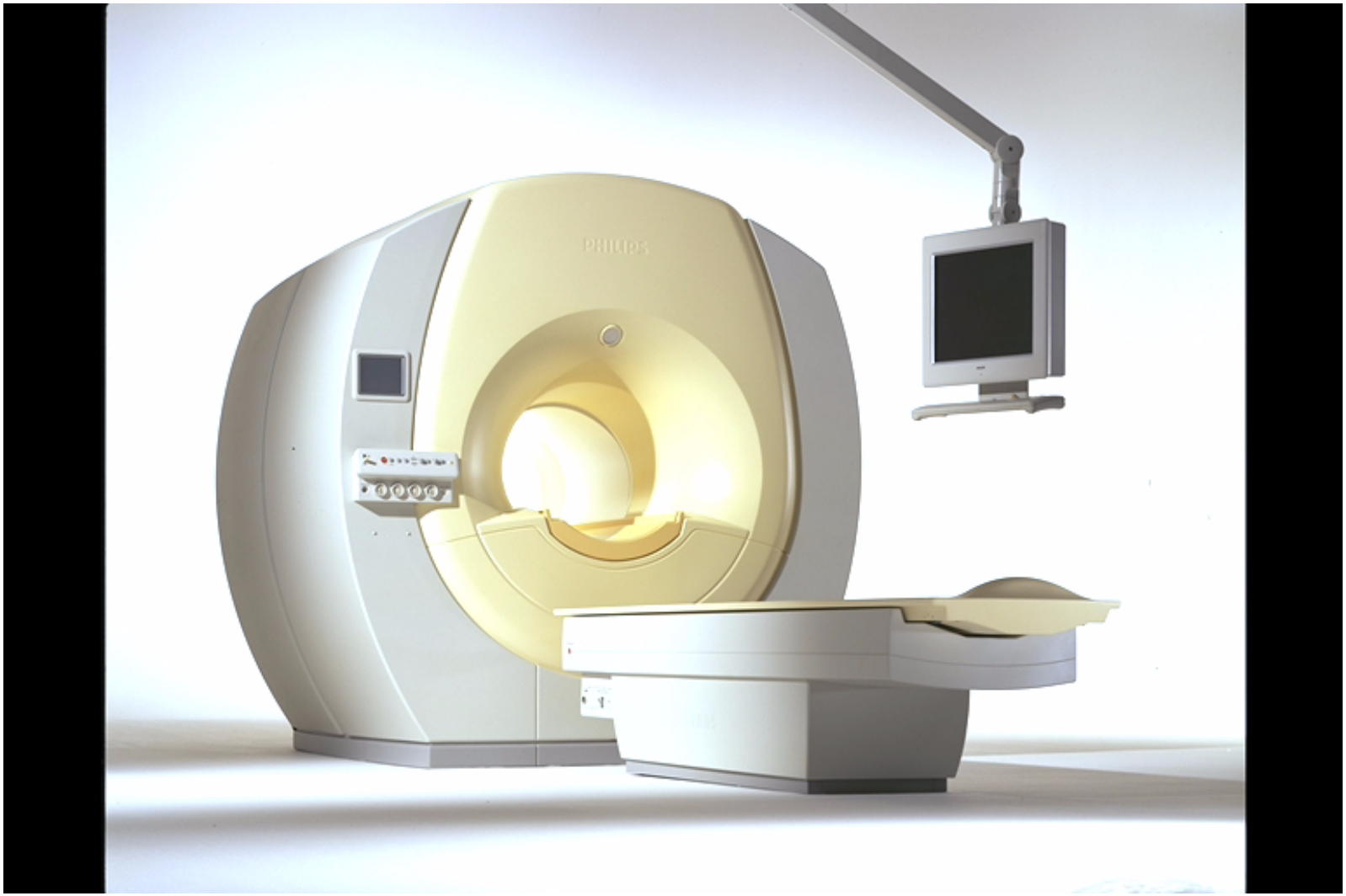
This presentation positions the architecture discipline as a means to create good, useable and technically balanced systems. The system architect fulfils a central role. More than ever the system architect needs business and application insight to give direction to the technical design process.

14th November 2000 version: 0.5

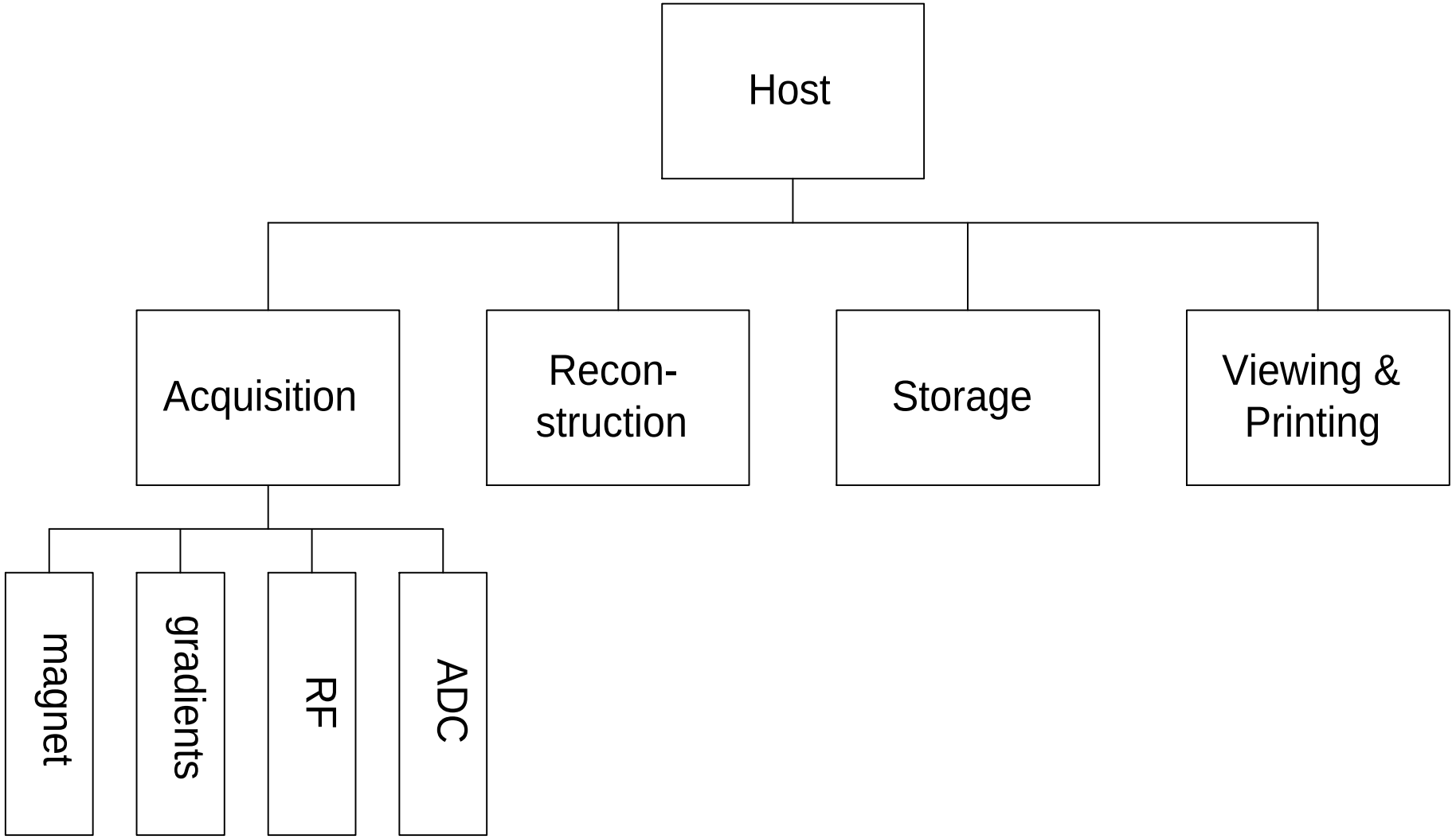
Presentation flow

- Case: MRI scanner
- Follow the system architect bottom up through the MRI scanner
- ”CAFCR” framework
- The role of the system architect
- How does a system architect work?
- Conclusion

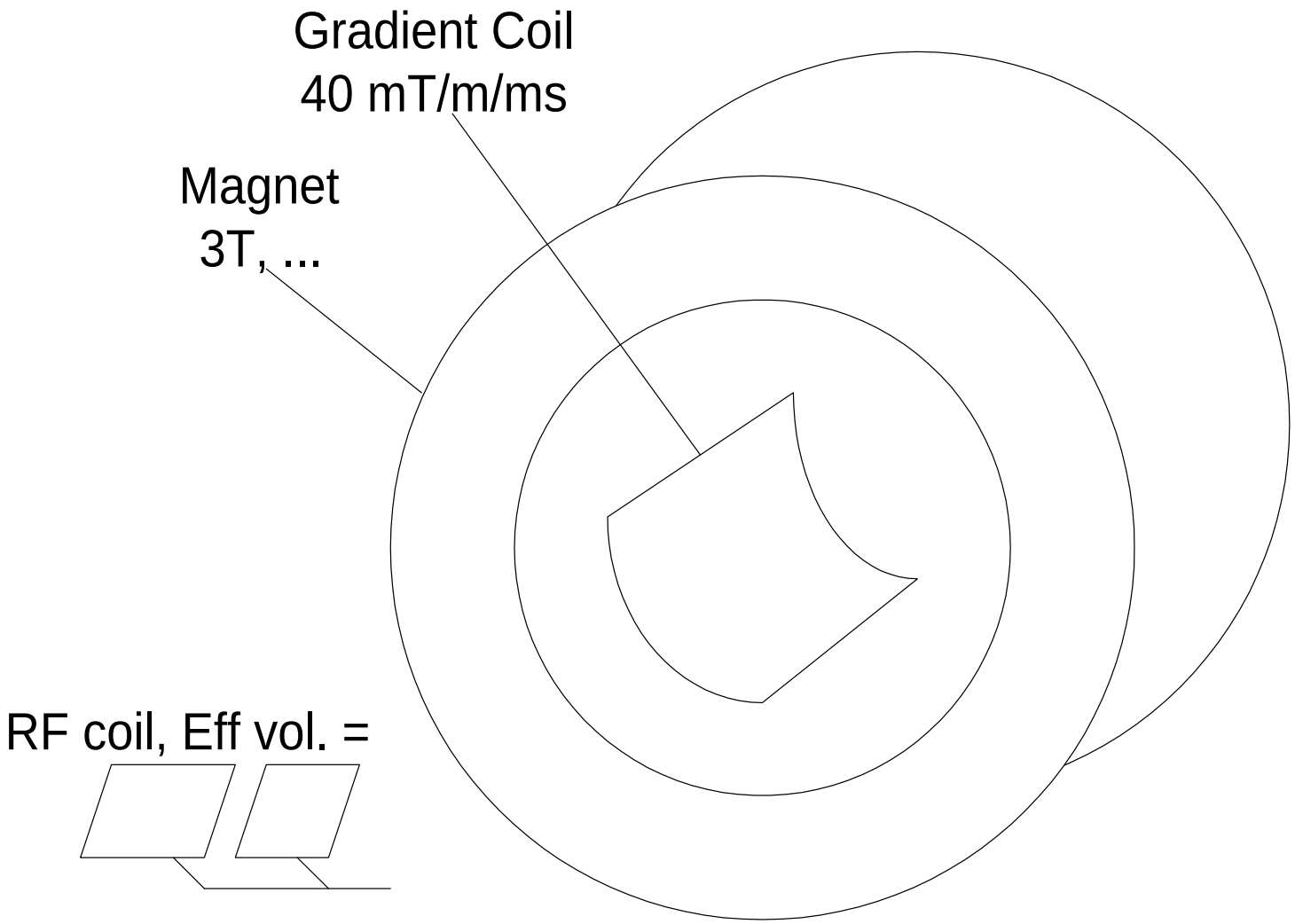
Illustration case: MRI scanner



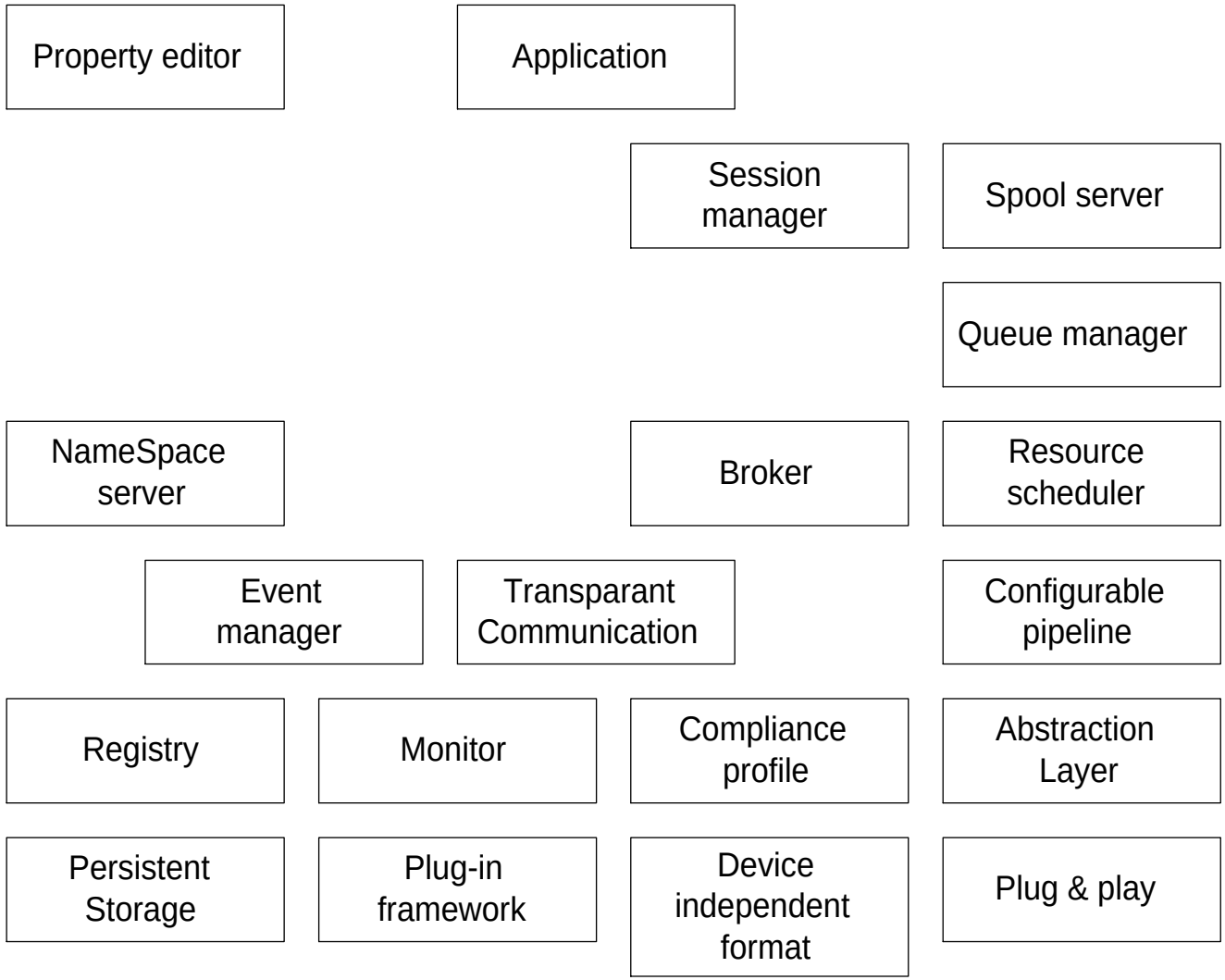
Block diagram view



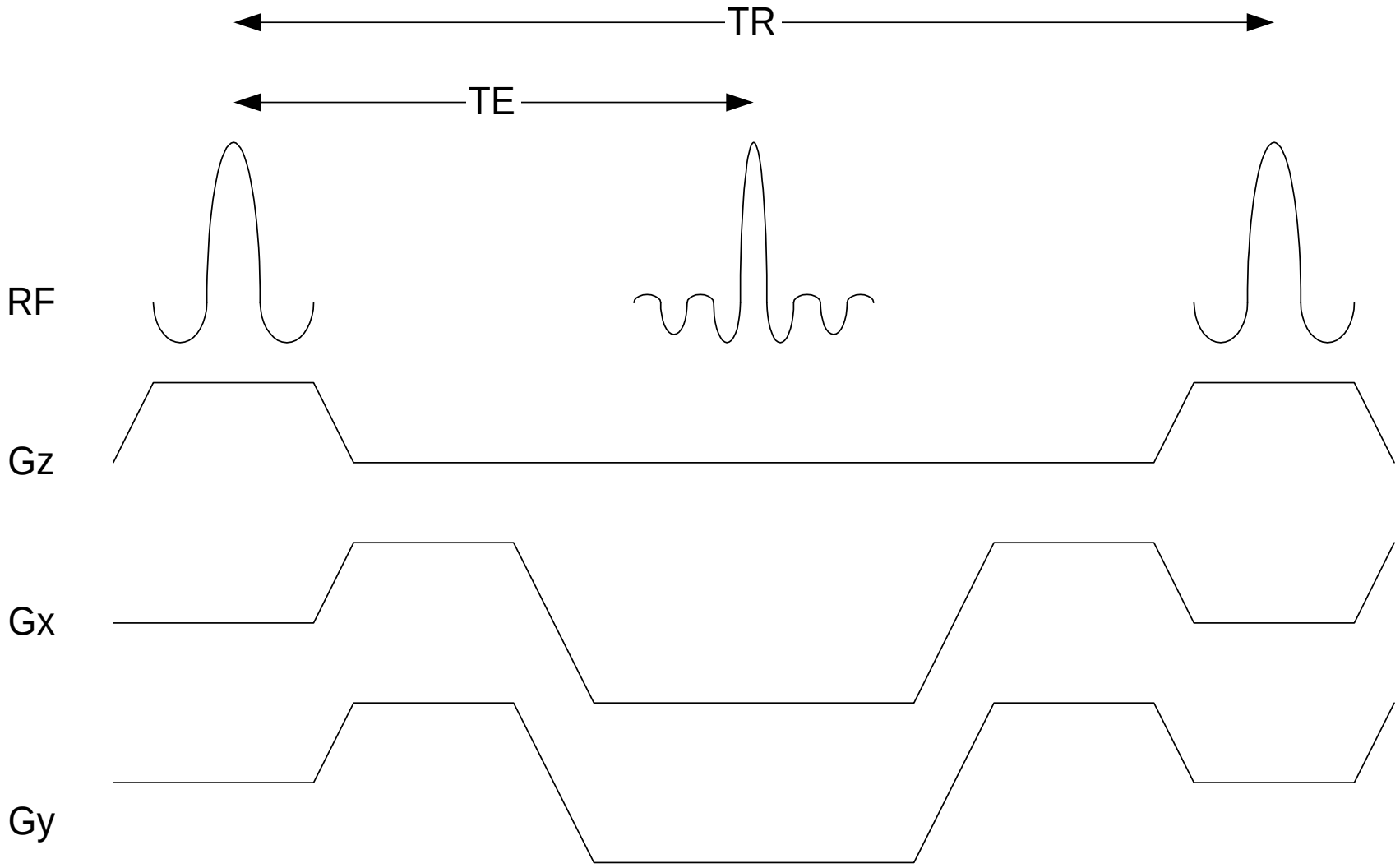
Physics view



Software architecture view



MR imaging methods view



Conceptual Work by the architect

- Most disciplines require multiple views, for instance circa 4 views in SW [Kruchten, Soni]
- Only a subset of disciplines has been shown (not shown are a.o. mechanics, logistics, project management)

The **system architect integrates** the **complementing disciplinary views**

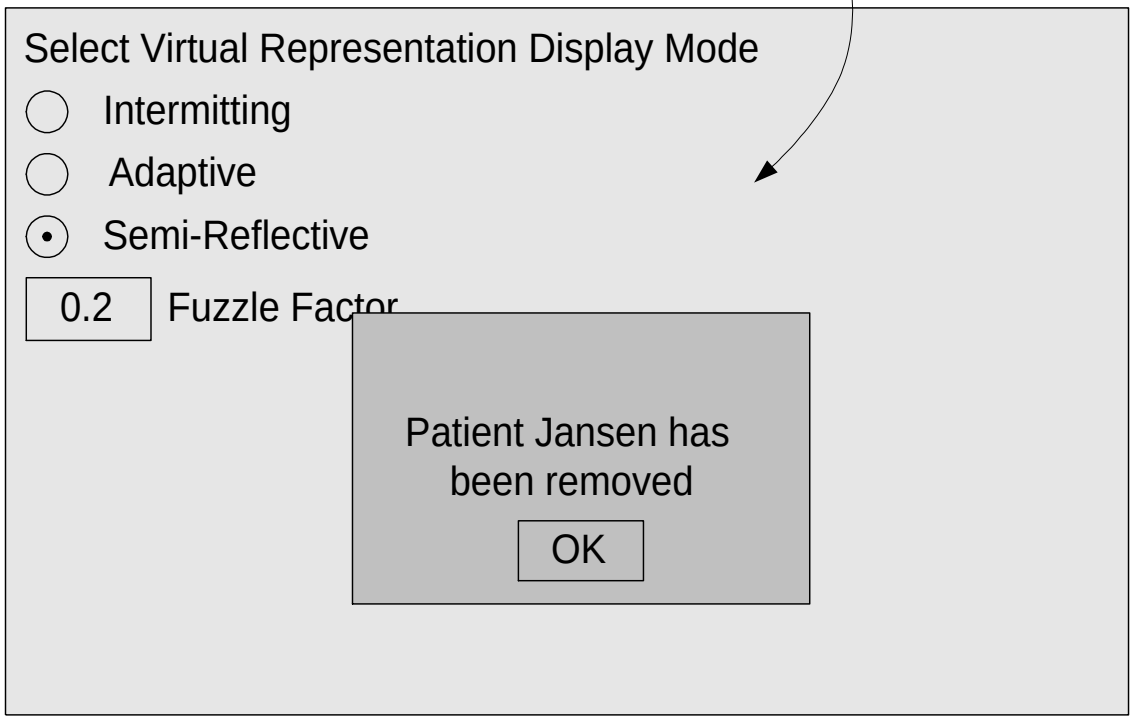
However

Decisions and trade-offs in the **conceptual view** are driven by **application**, **business** and **operational** inputs

Useability and main stakeholders

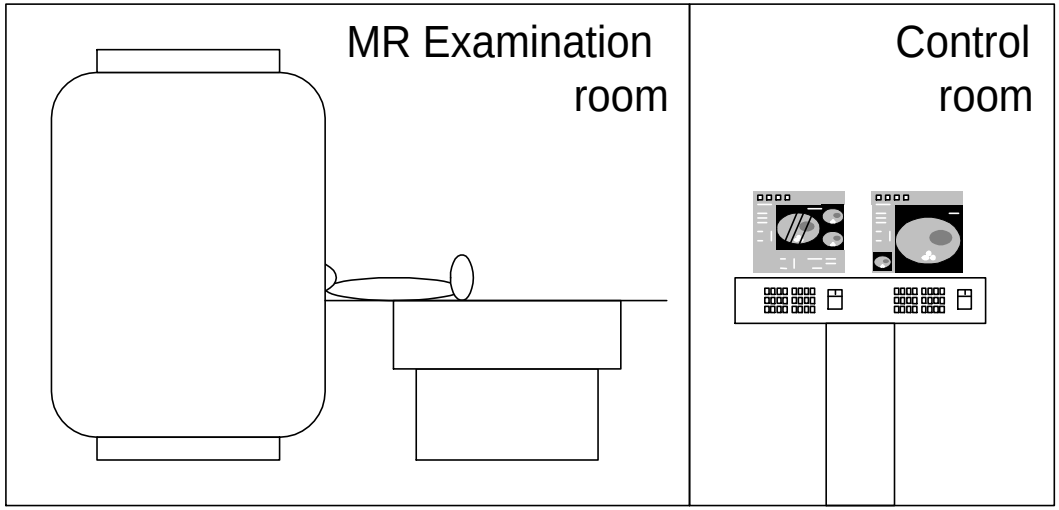
The engineer creates a technological UI...

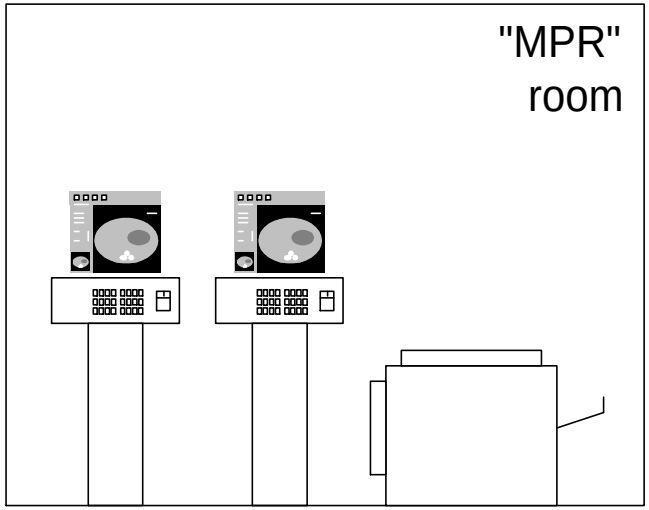
without imagining the clinical reality

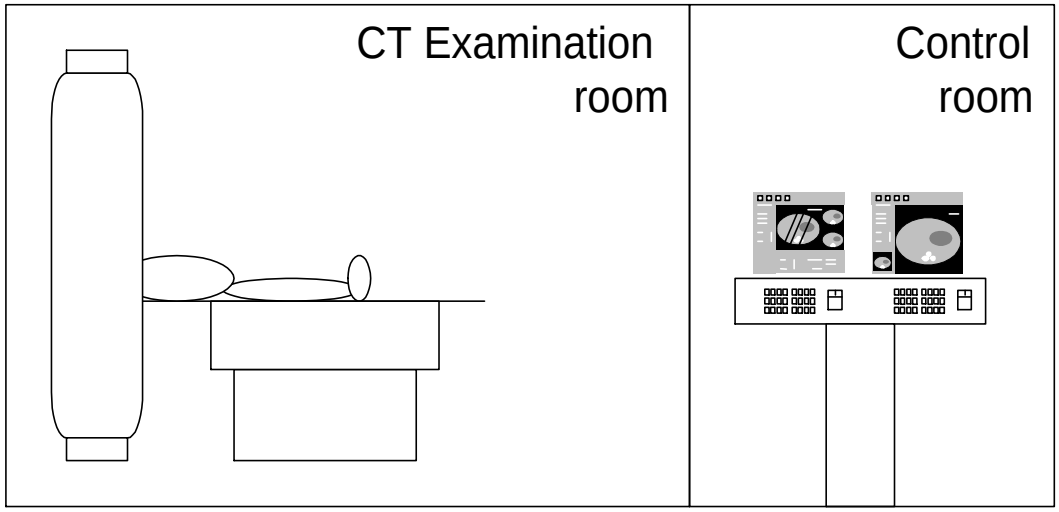


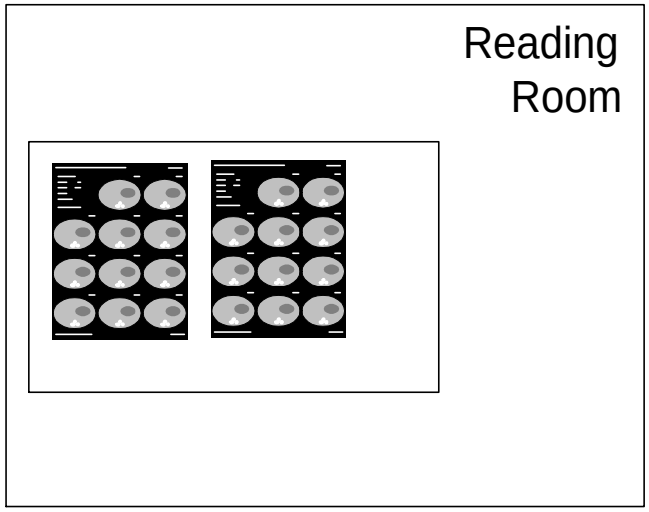
"In the meantime the patient is horrified by the intimidating system, the weird cage around his body and the EKG leads attached to his breast..."

Radiology department view

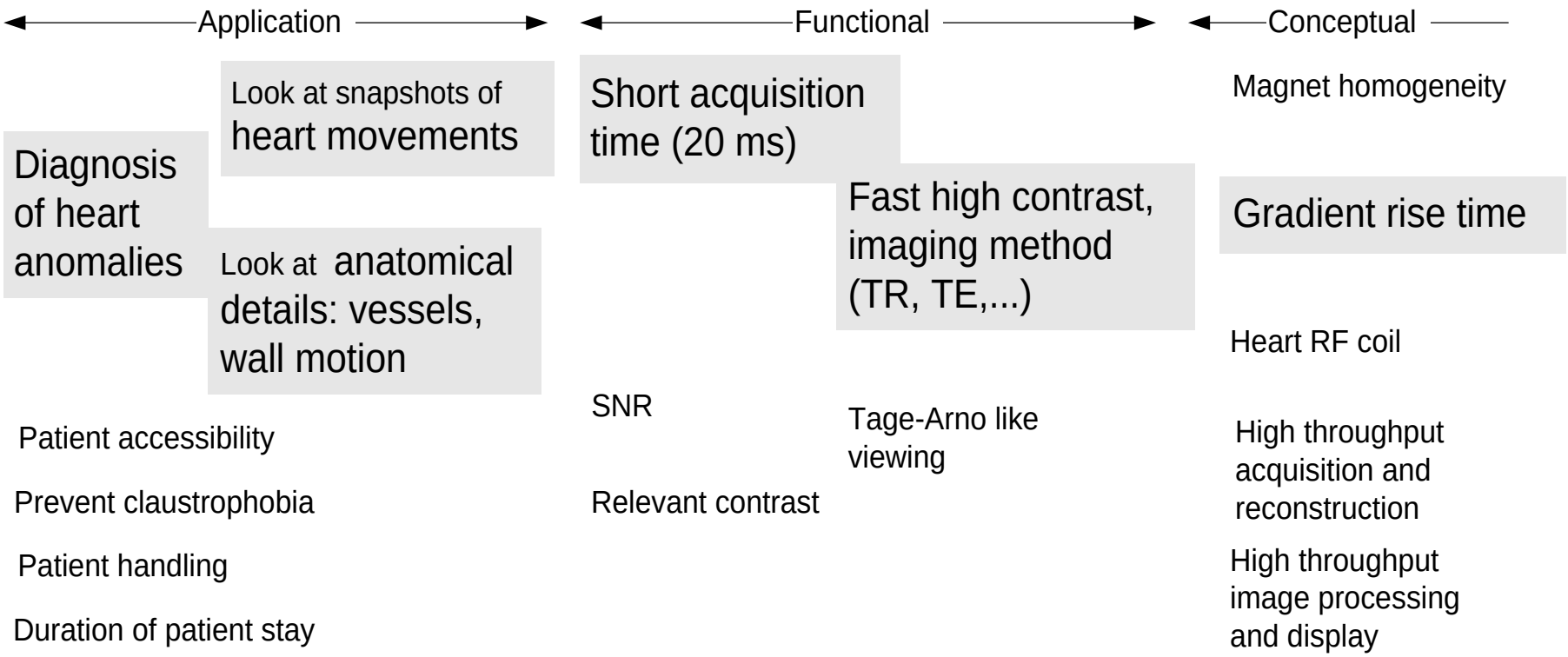




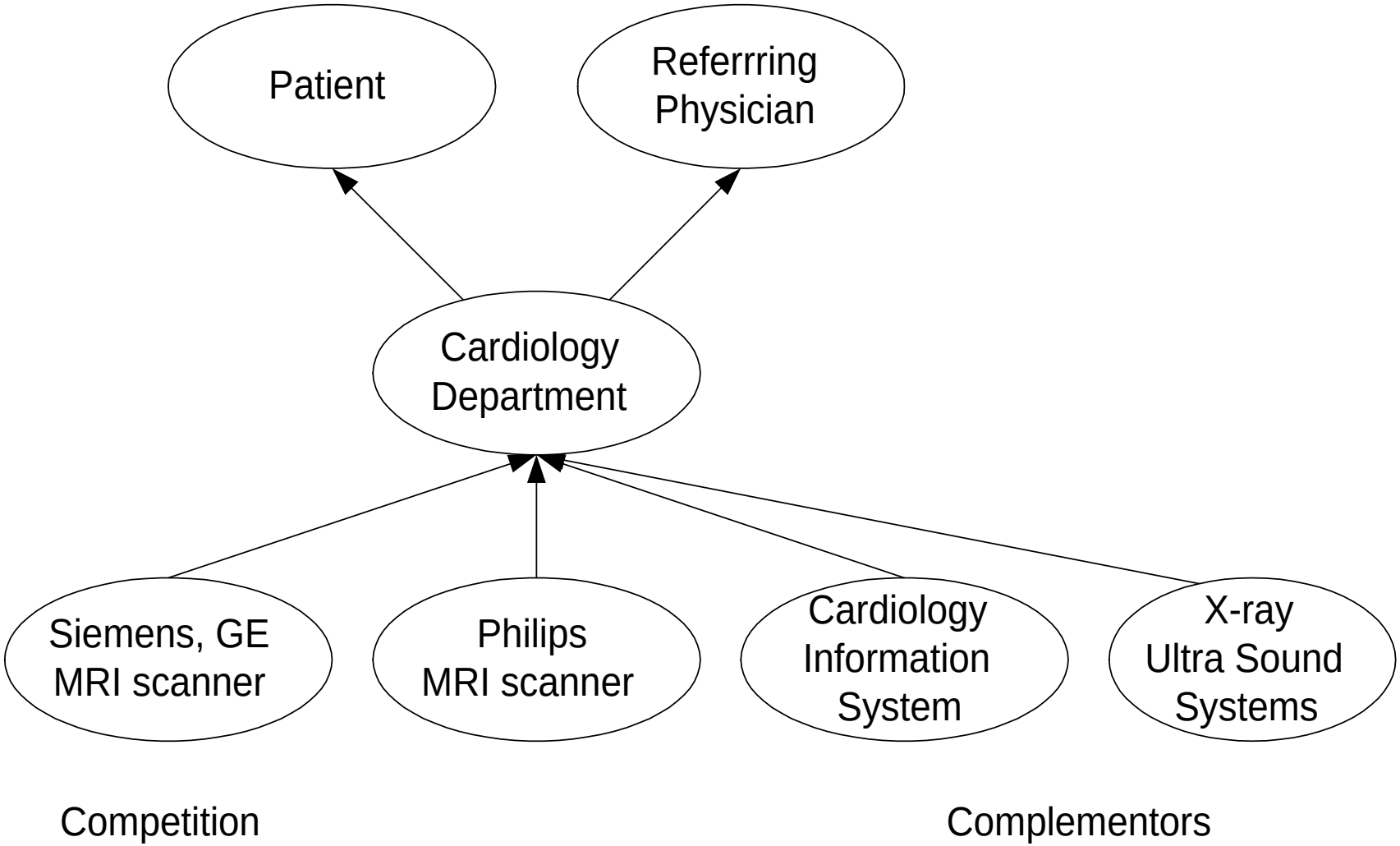




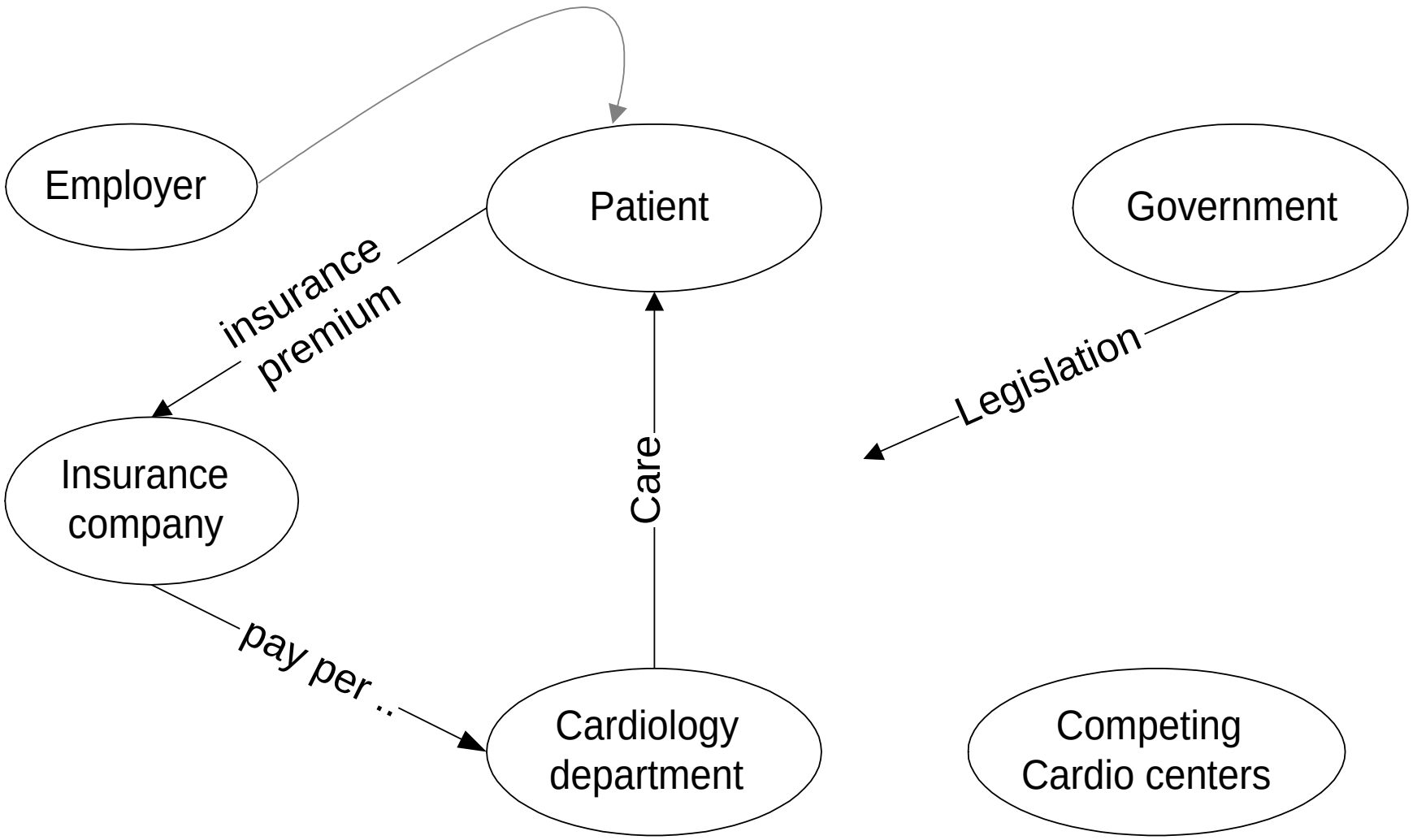
Cardio application drivers and related features



Cardio Market Model



Cardio Business Model



Cardiology business drivers

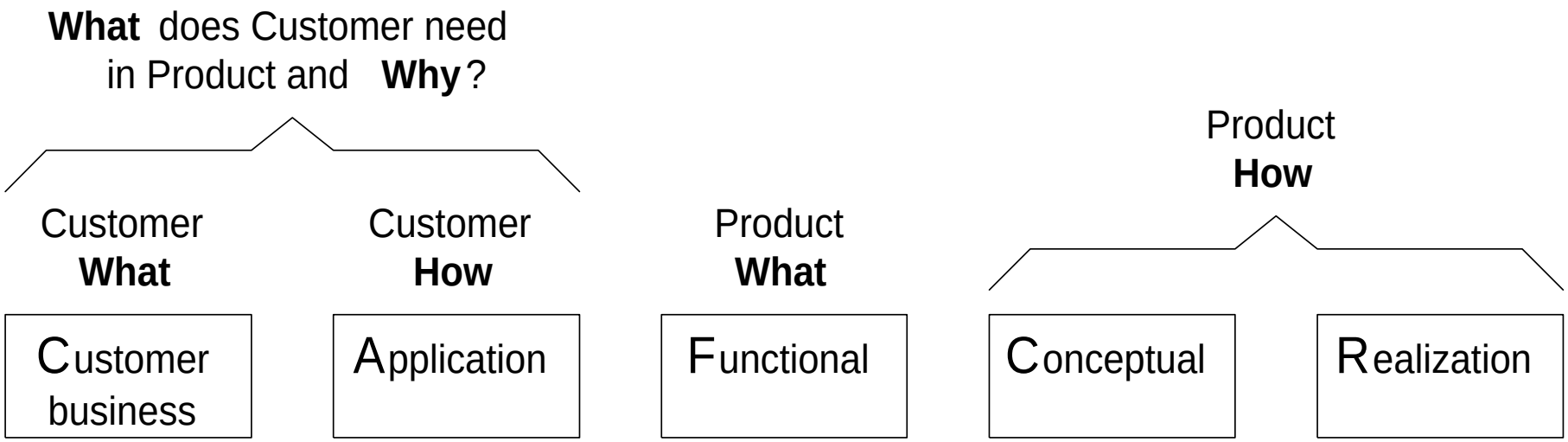
Key Business drivers →	Derived Application drivers	
Recuperation rate	Diagnosis of heart anomalies	
Mortality rate	Patient Accessibility	Interventional support
	Duration of patient stay	Prevent claustrofobia
Cost/treatment	Patient emergency access	
	Patient monitoring capabilities	Patient handling
Attractiveness	Department image	
	Clinical workflow	
	Integration with information systems	

Business and application understanding by the architect

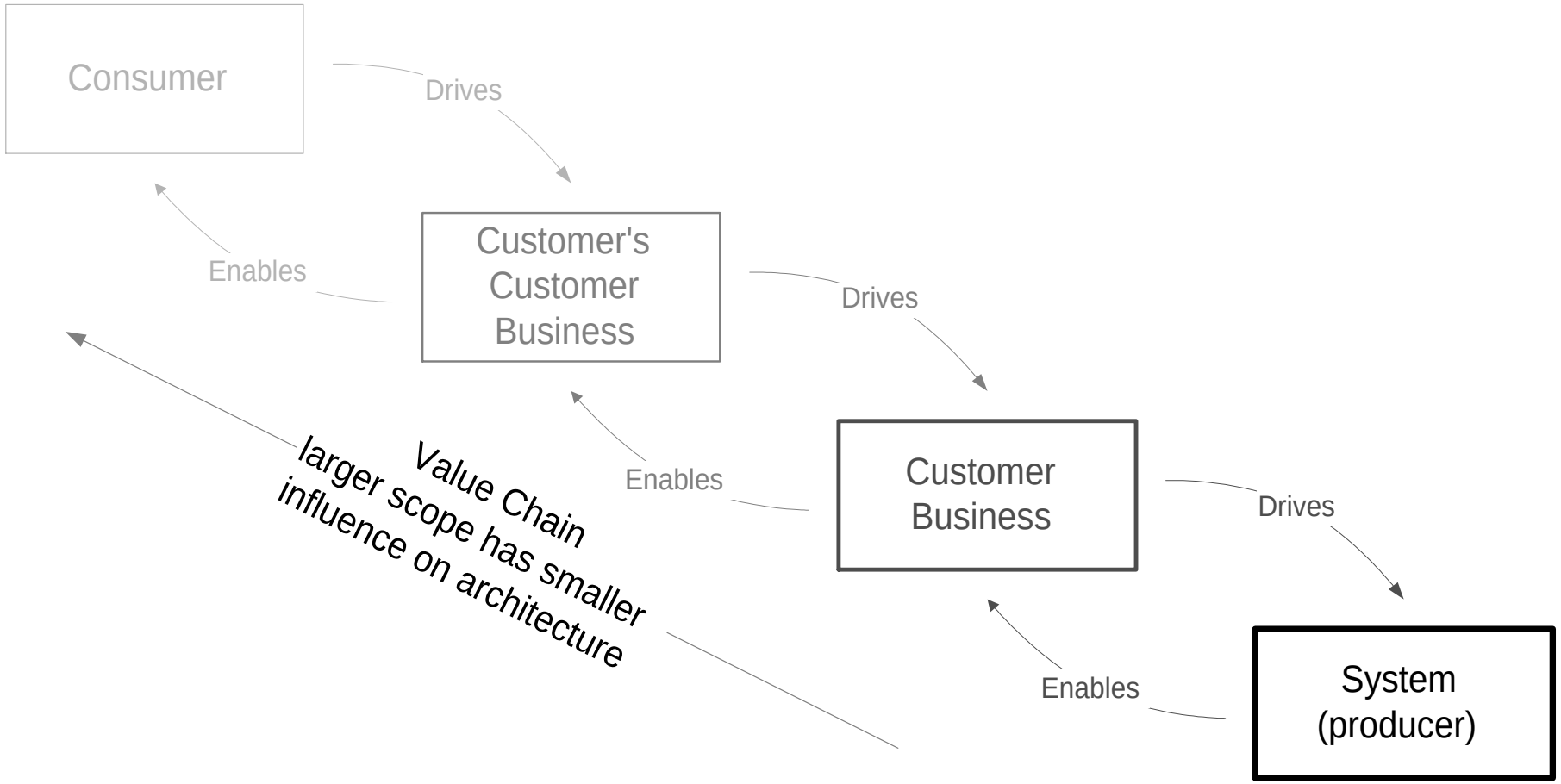
- Only a subset of required views has been shown (not shown are a.o. information model, workflow, stakeholders and stakeholder concerns)
- Marketing and application specialists are the primary owners

The system architect needs to understand the context to make a good and useable design

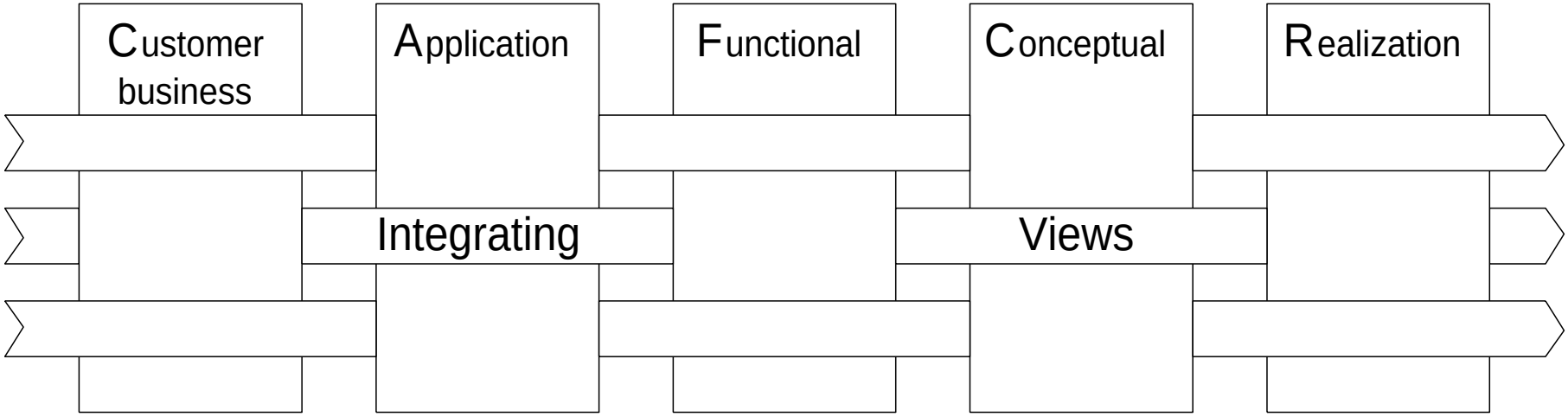
System Architect integrates 5 viewpoints



Context of the context



Integration of 5 views

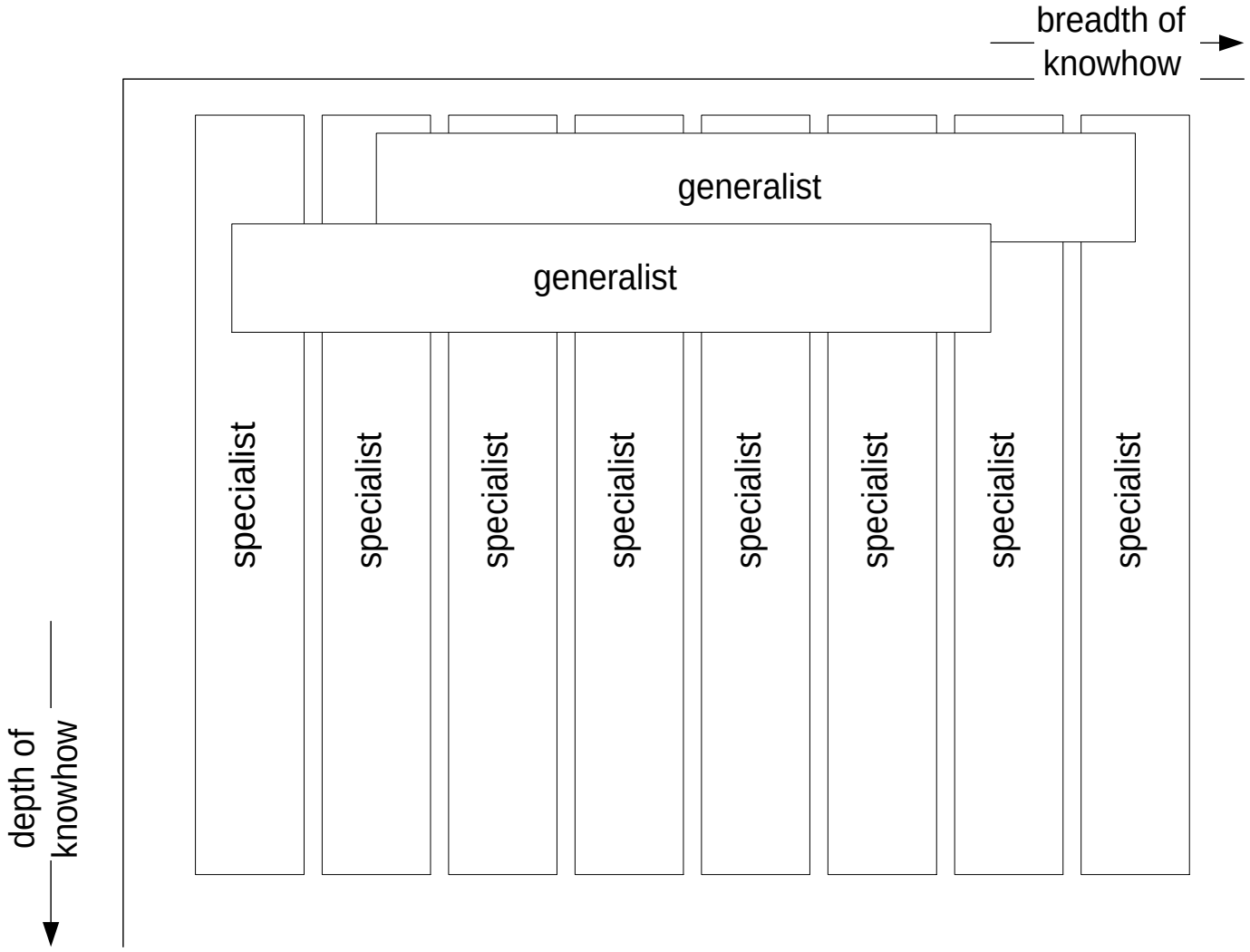


High margin Cardiology market	Cost per examination model	Patient throughput features	System throughput model	Budget in seconds

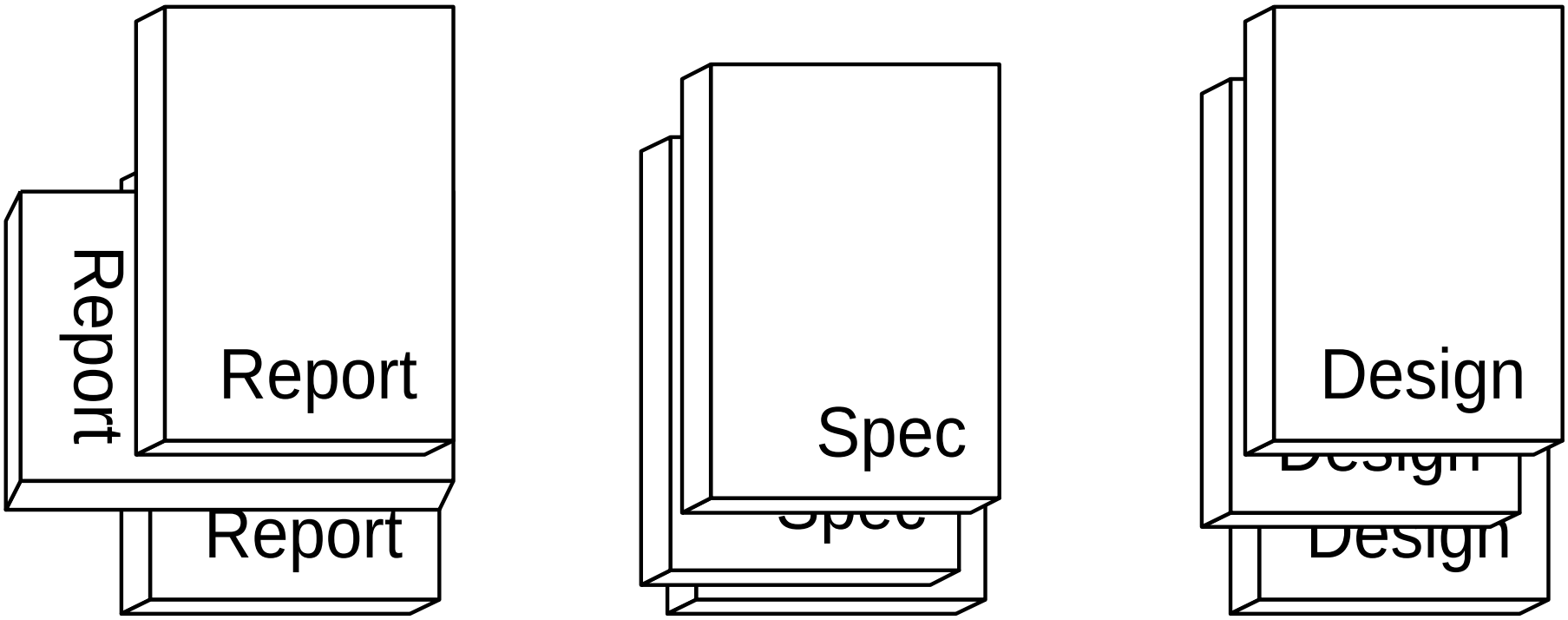
Organizational questions w.r.t. the System Architect

- Who is this system architect?
- What is his task?
- What are his responsibilities?
- What is his role?
- Where does he fit in the organization?

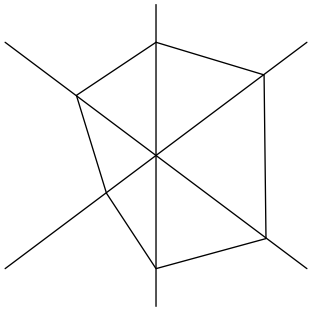
The System Architect is the generalist of the team



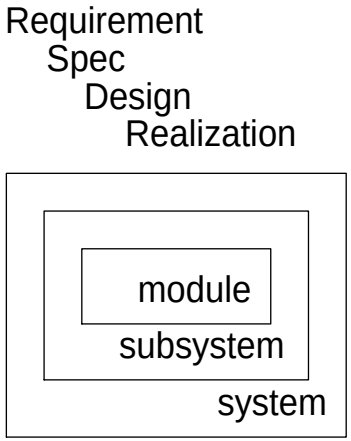
Deliverables of a System Architect



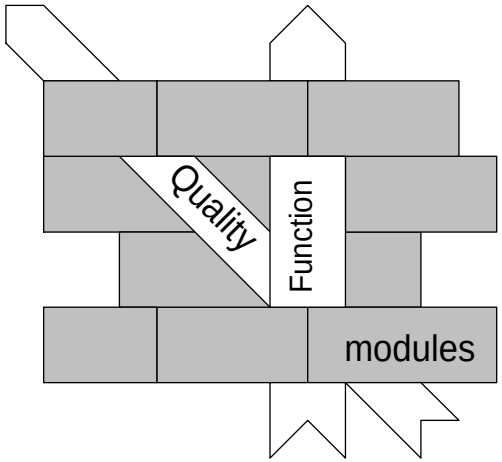
Responsibilities of a System Architect



Balance



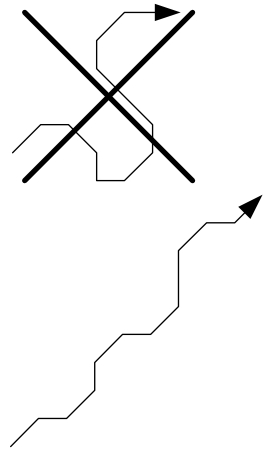
Consistency



Decomposition
Integration

Overview

KISS



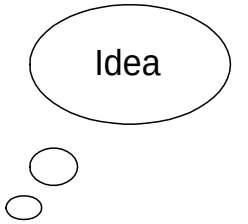
Elegance
Simple

Integrity

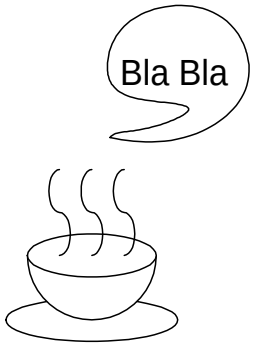
Examples of Secondary Responsibilities

responsibility	primary owner
business plan, profit	business manager
schedule, resources	project leader
market, salability	marketing manager
technology	technology manager
process, people	line manager
detailed designs	engineers
useability	application manager

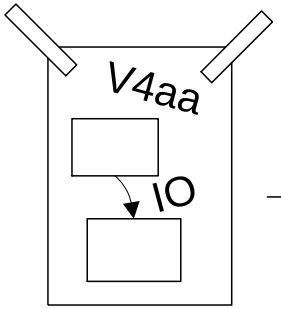
What does the System Architect **do**?



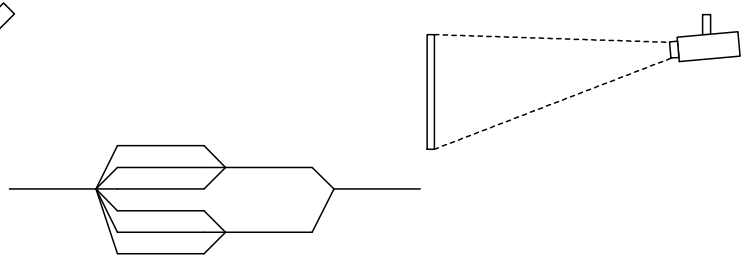
think,
analyse



(informal)
listen, talk
walk around

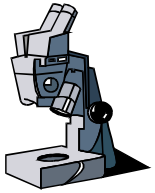


design
brainstorm
explain

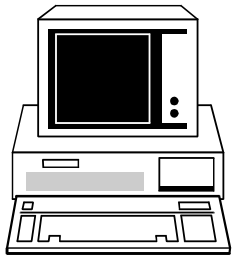


assist projectleader
workbreakdown,
schedule, risks

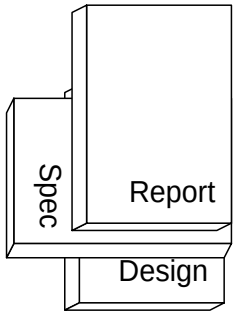
present, meet,
teach
discuss



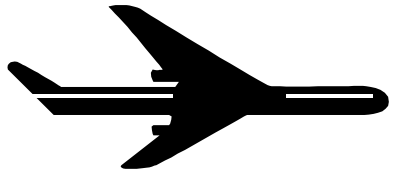
Test
Integrate



write
consolidate
browse

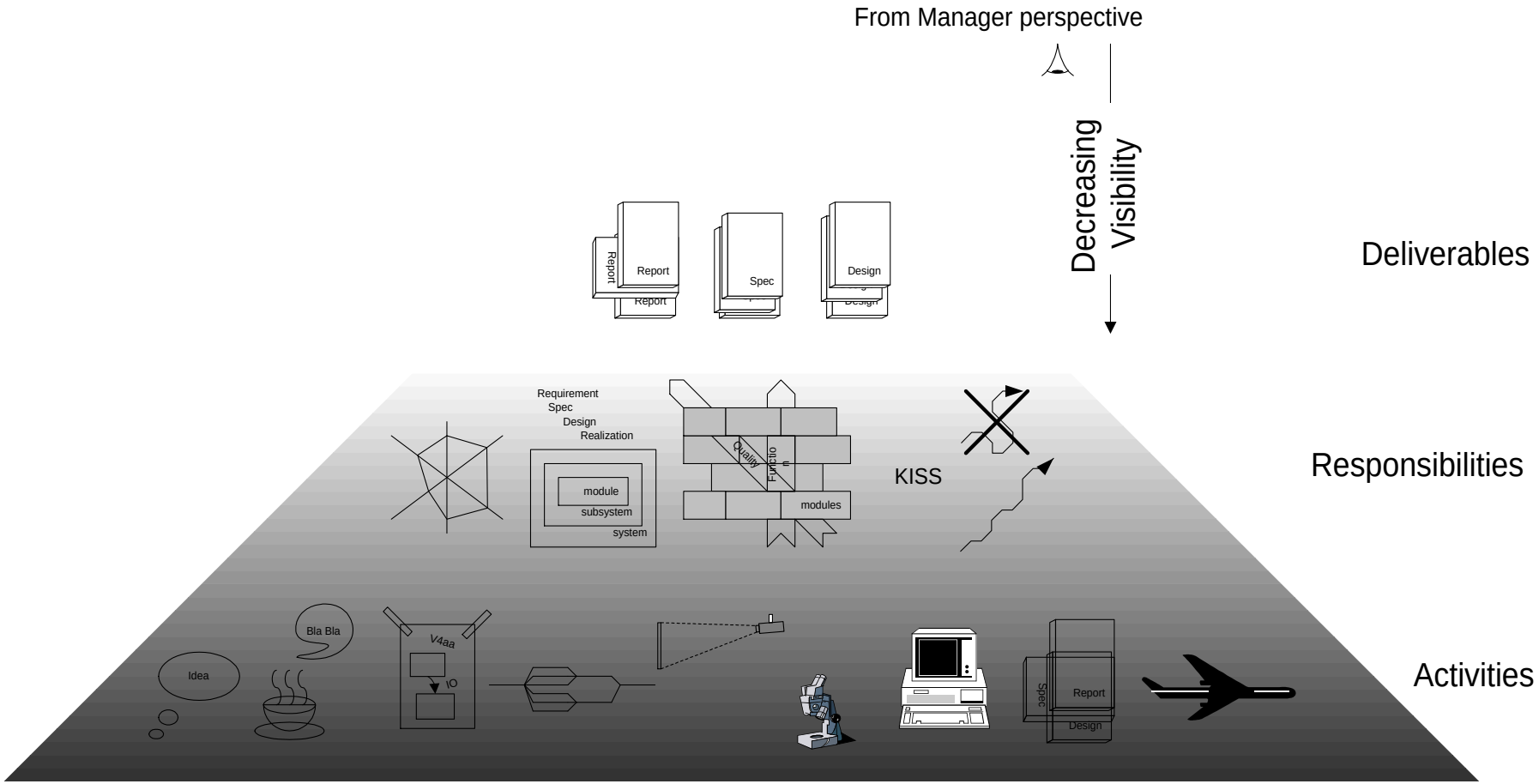


read,
review

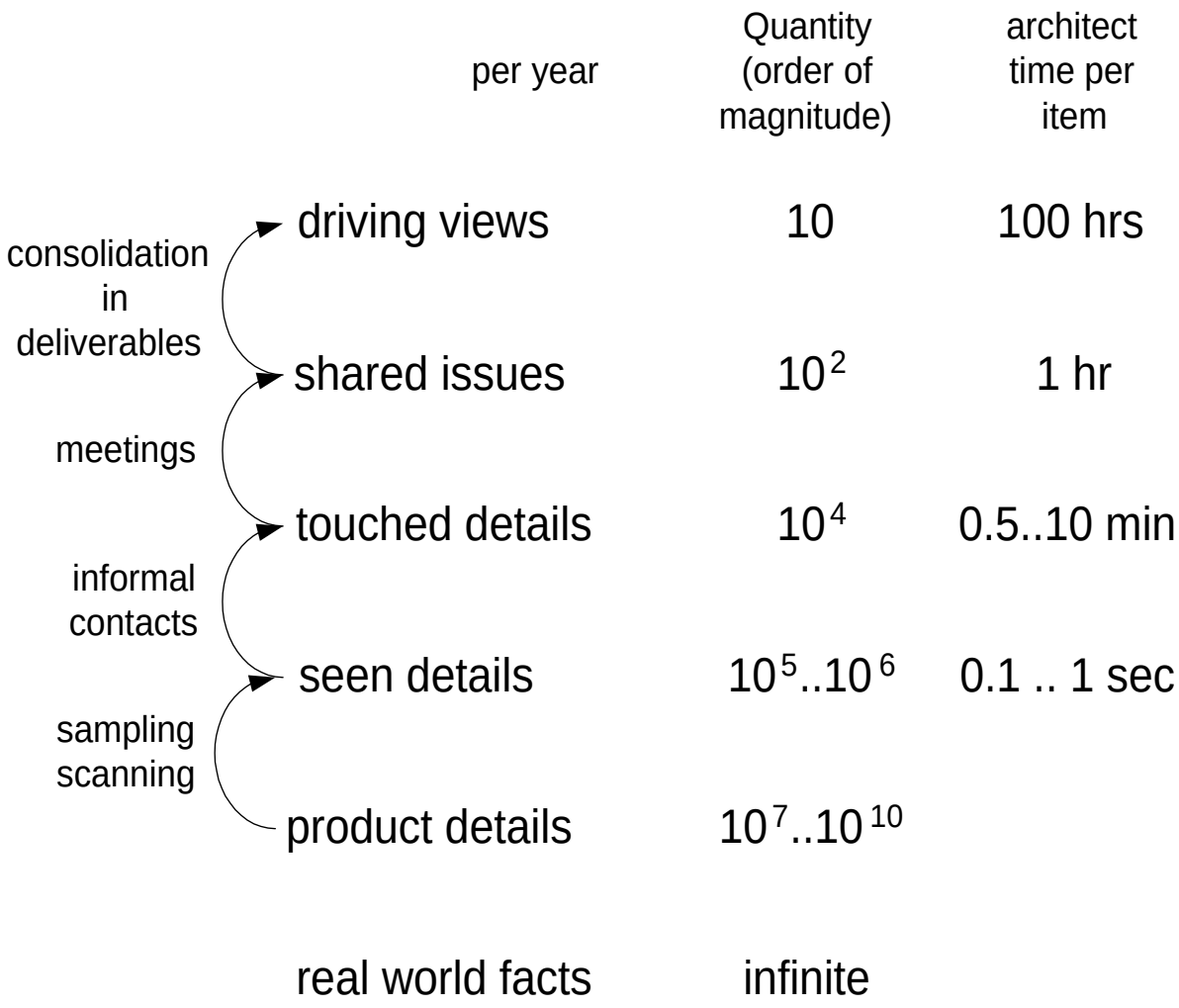


Travel to
customer
supplier
conference

Visible output versus invisible work



Bottom-up elicitation of system characteristics

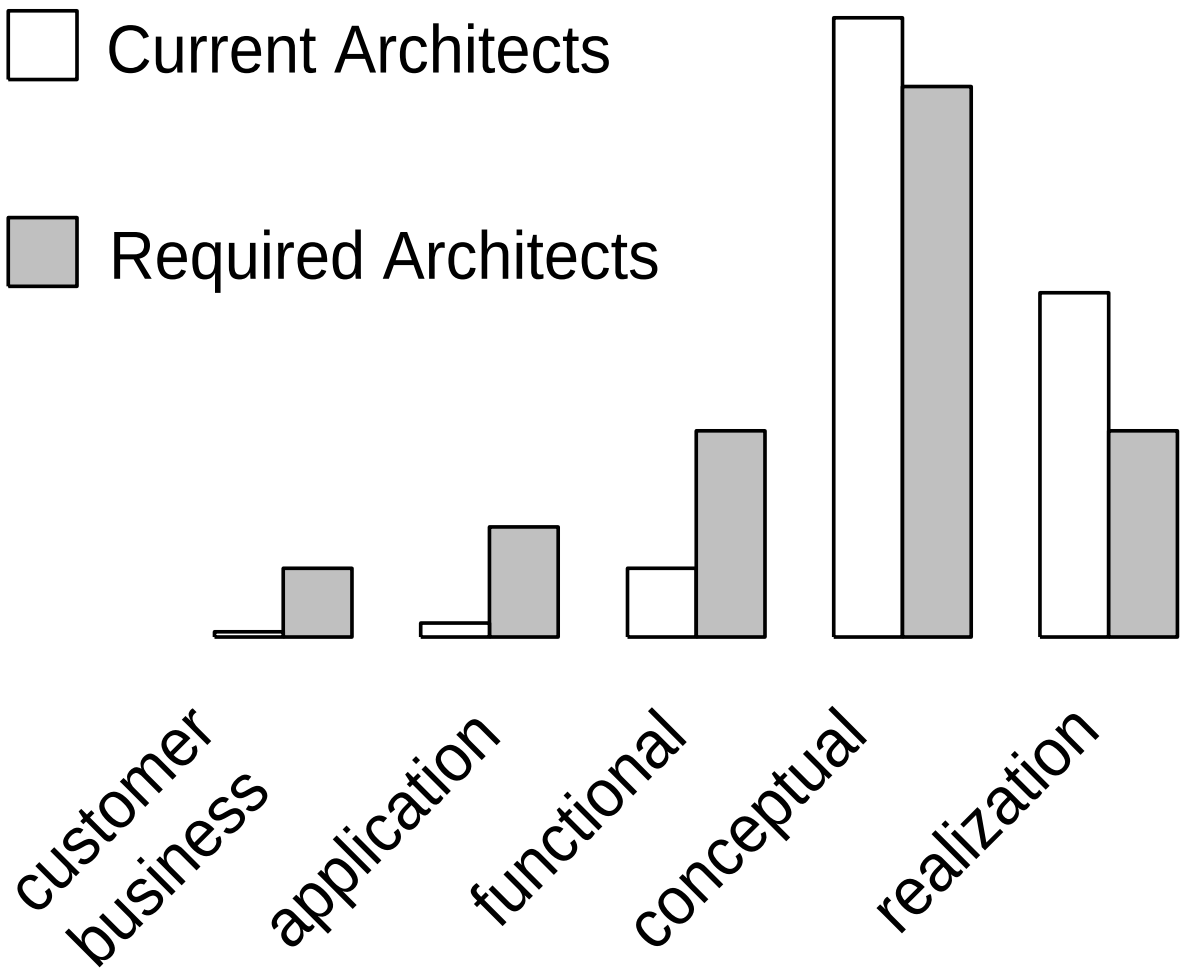


From scenario to budget

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

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

Architects must increase customer side contribution



Acknowledgements

The term ”Techno-nerd” is gracefully adapted from ”Enginerds” by Kees van Overveld. The drive towards human oriented architecting is stimulated by interaction with **Kees van Overveld** and **Dieter Hammer** as a subgroup of the working group ”Human values & IT”, see:

www.it4humans.org