

# Architect as Content Leader

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## Abstract

Systems architects play a complementary role to managers, such as project leaders, marketing managers, line managers. They struggle often with their recognition, contribution, and role. In this presentation, we advocate that systems architects are content leaders. We look at past projects to see how far they are recognized, and how they contributed. How can we earn and live up to the proposed role?

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August 16, 2025  
status: preliminary  
draft  
version: 0

What do we teach?	context system multi-disciplinary <i>architect</i>
Why, what do we assume?	connect breadth and depth abstraction levels roles
Why, what to achieve?	content leadership integral, holistic, big picture good system fitting context
Past, where were companies?	system level ill understood context ill connected lacking effectiveness and efficiency
Today, where are companies?	
Why are we in this state?	that is the question ☹
Future what and how to teach?	

# Figure of Contents™

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# What do we teach bachelor students?

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Teaching 2<sup>nd</sup> year bachelor students

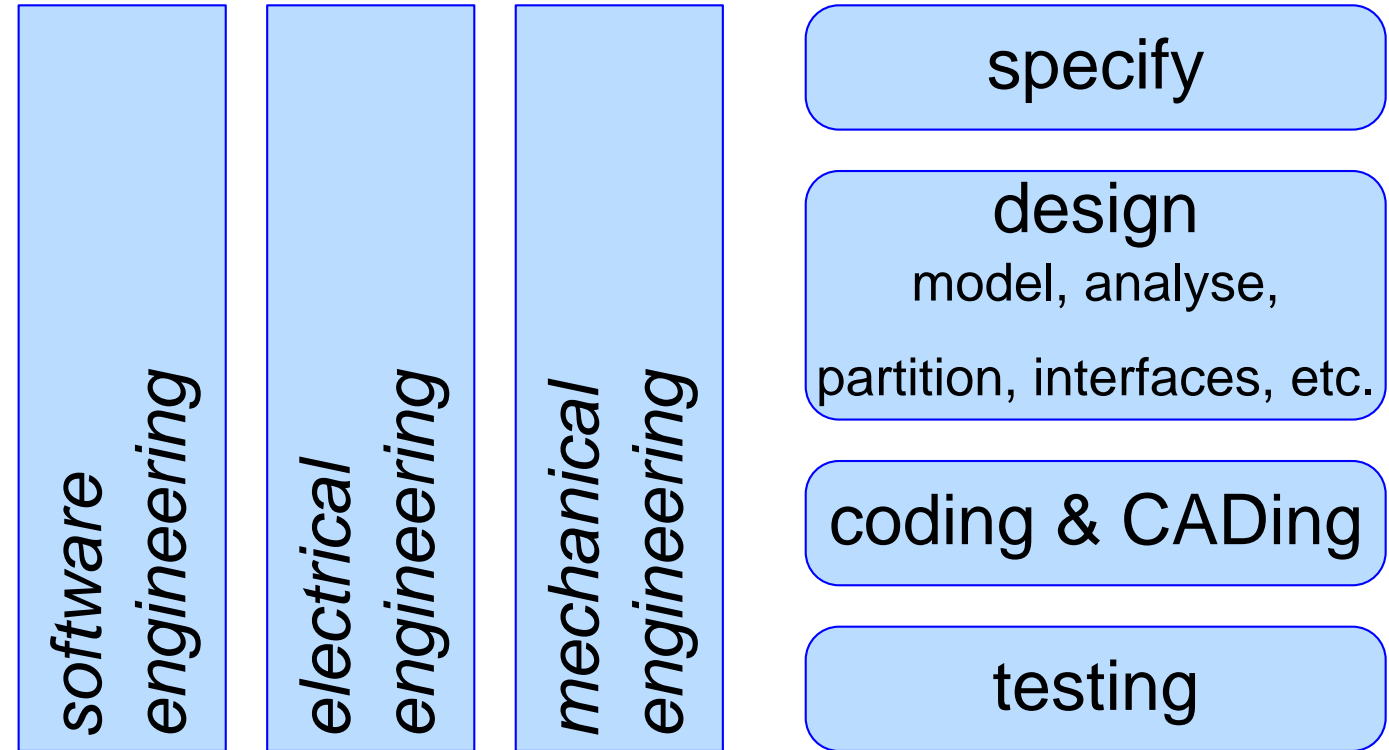
Goal: create awareness of what is beyond engineering

And now, the first 6 slides of their course

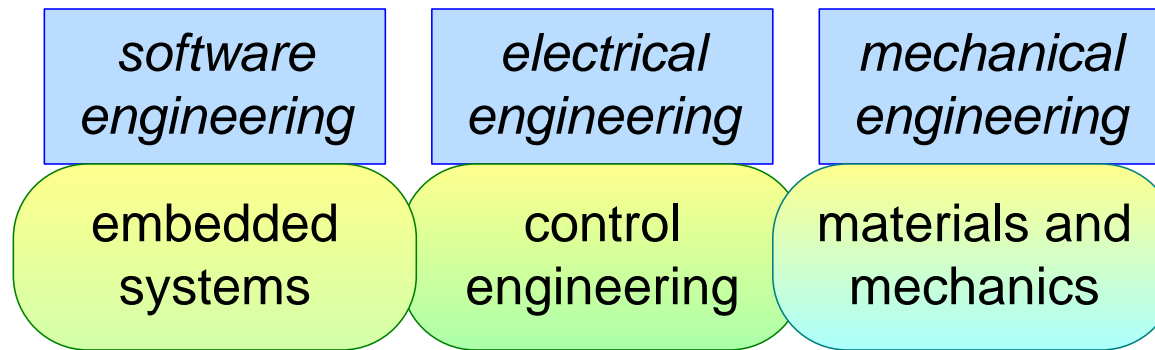
# Mono-disciplinary engineering

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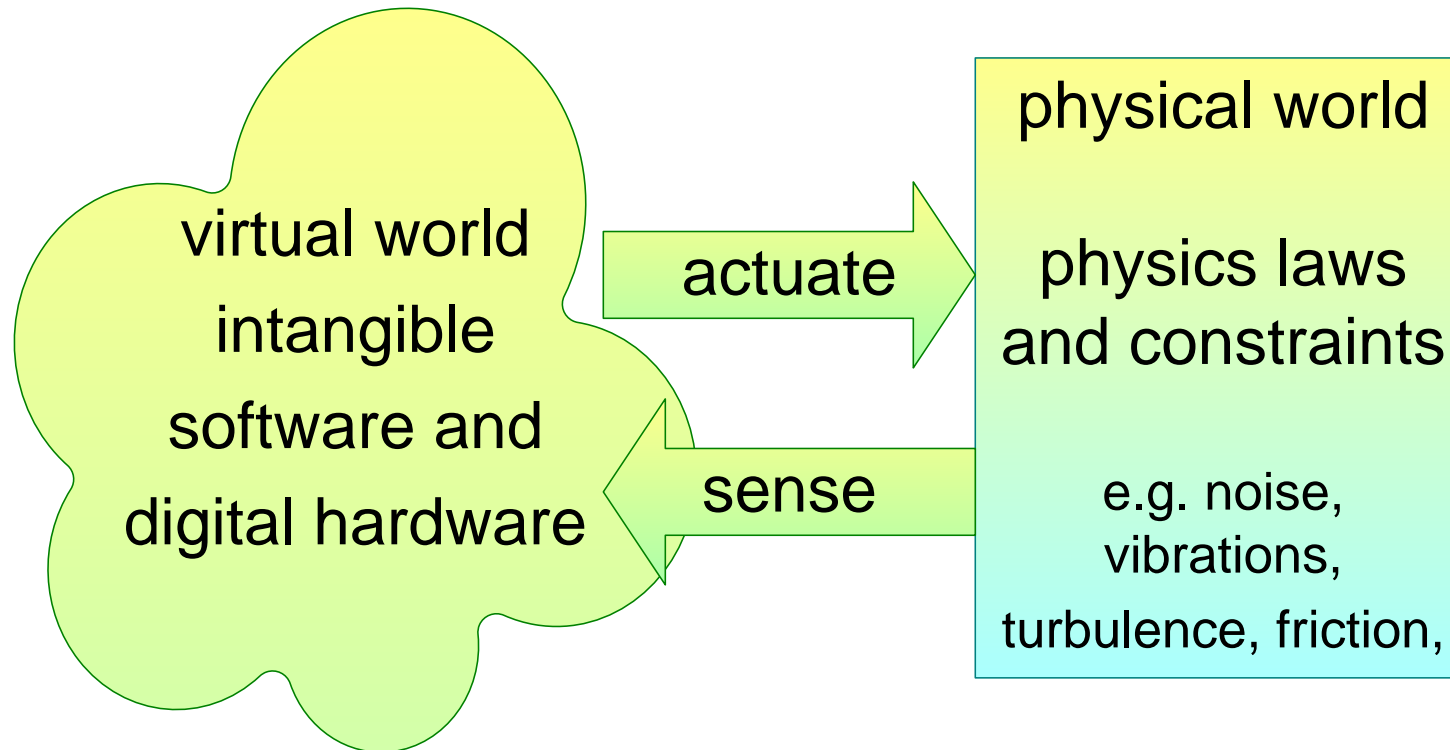
mono-disciplinary  
engineering



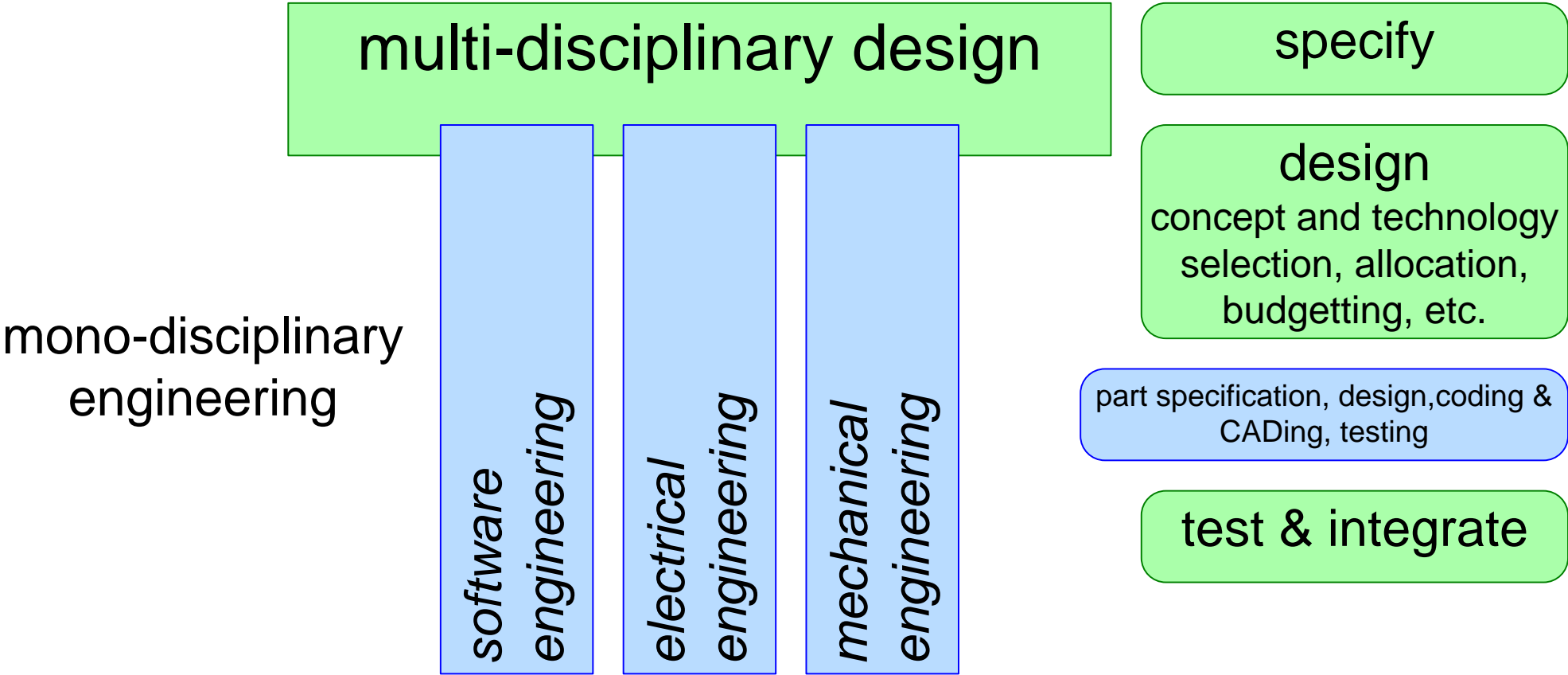
# Huge differences in language and way of thinking



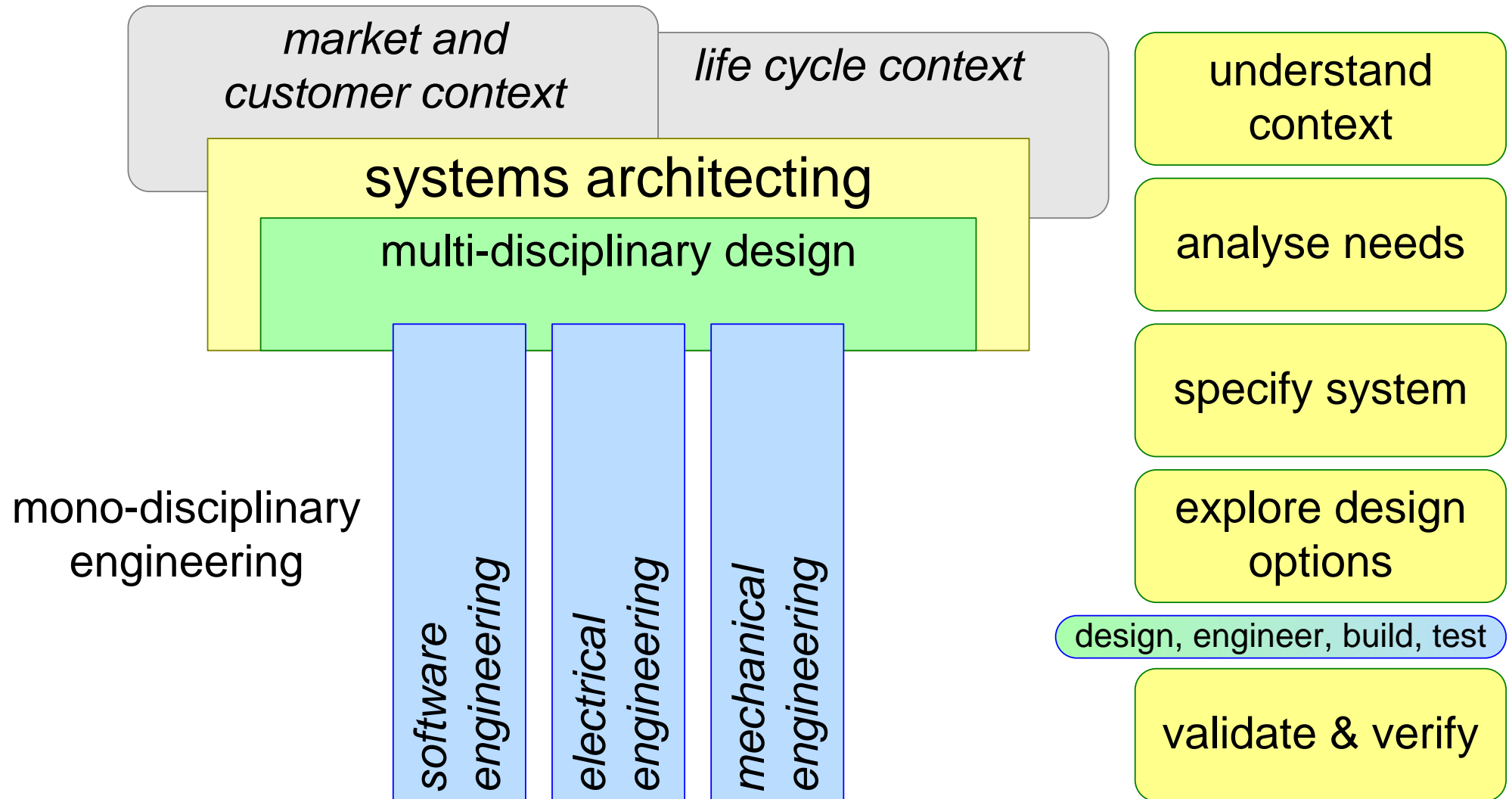
*completely different world views*



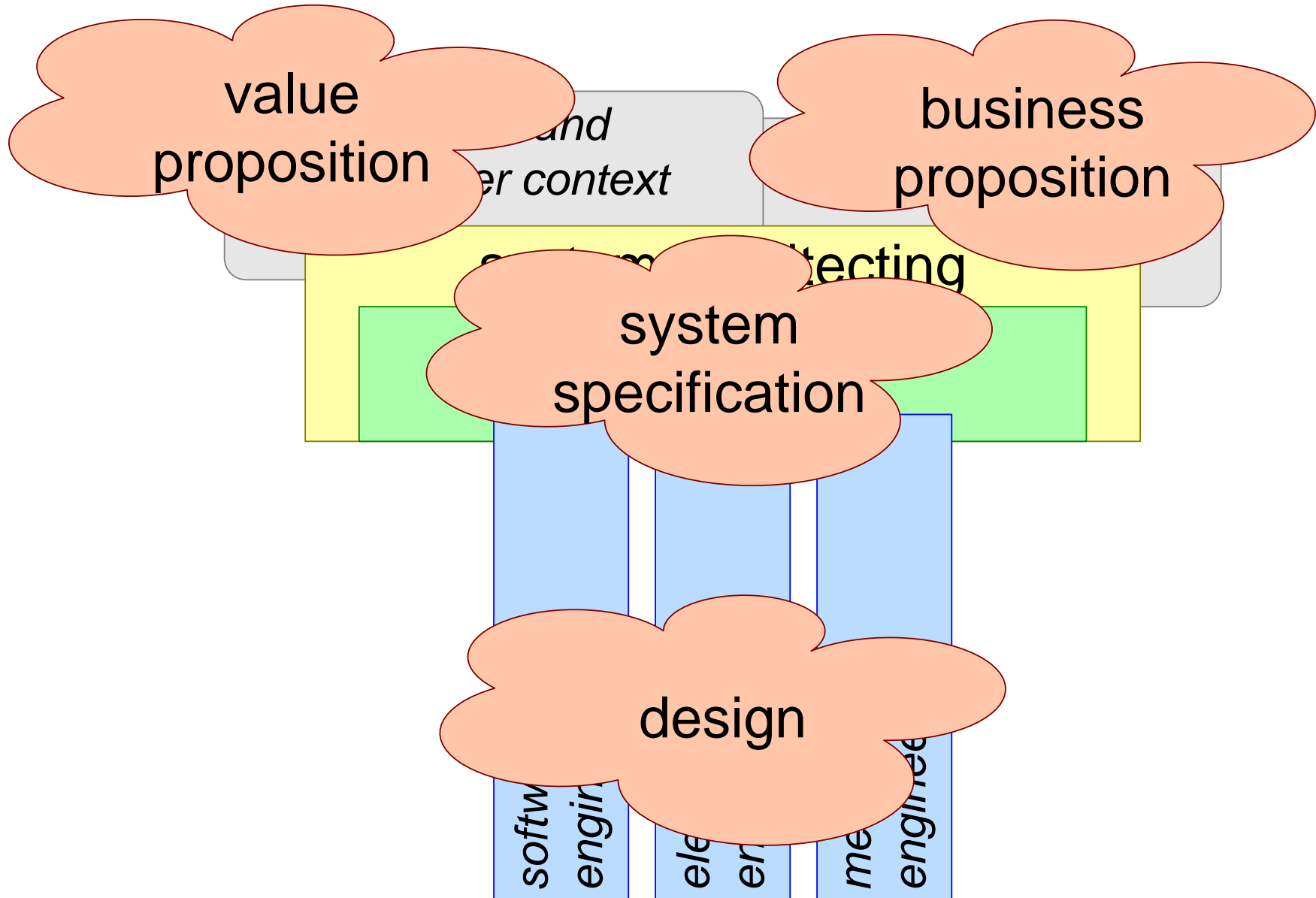
# Multi-disciplinary design and engineering



# Architecting: Fit-For-Purpose



# Delivery at the end of this module



# More specific deliveries

## *Value Proposition*

*Why does customer want to buy?*

*Why do users like to use the system?*

- customer key drivers
- cost of ownership
- customer business analysis
- customer stakeholders and concerns
- story or scenario
- context diagram
- work flow or ConOps

## *Business Proposition*

*How do we earn money?*

*How do we run a healthy business?*

- life cycle key drivers
- business model
- cash flow analysis
- life cycle stakeholders and concerns
- life cycle model
- supply chain
- organization chart
- plan

## *System Specification*

*What does customer get?*

*What is the system-of-interest that we deliver?*

- functions
- qualities (e.g. quantified performance)
- interfaces
- constraints, standards, regulations

## *Design*

*How will we realize this specification?*

*How do we ensure performance, safety, robustness, etc.?*

- partitioning and interfaces
- dynamic behavior, e.g. functional model
- performance budgets
- concept and technology selection
- make or buy, supplier selection

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Teaching master students in systems engineering

Goal: provide a foundation to become a systems engineer

Teaching experienced designers and architects

Goal: help them to step in leadership role

Content: nearly the same...

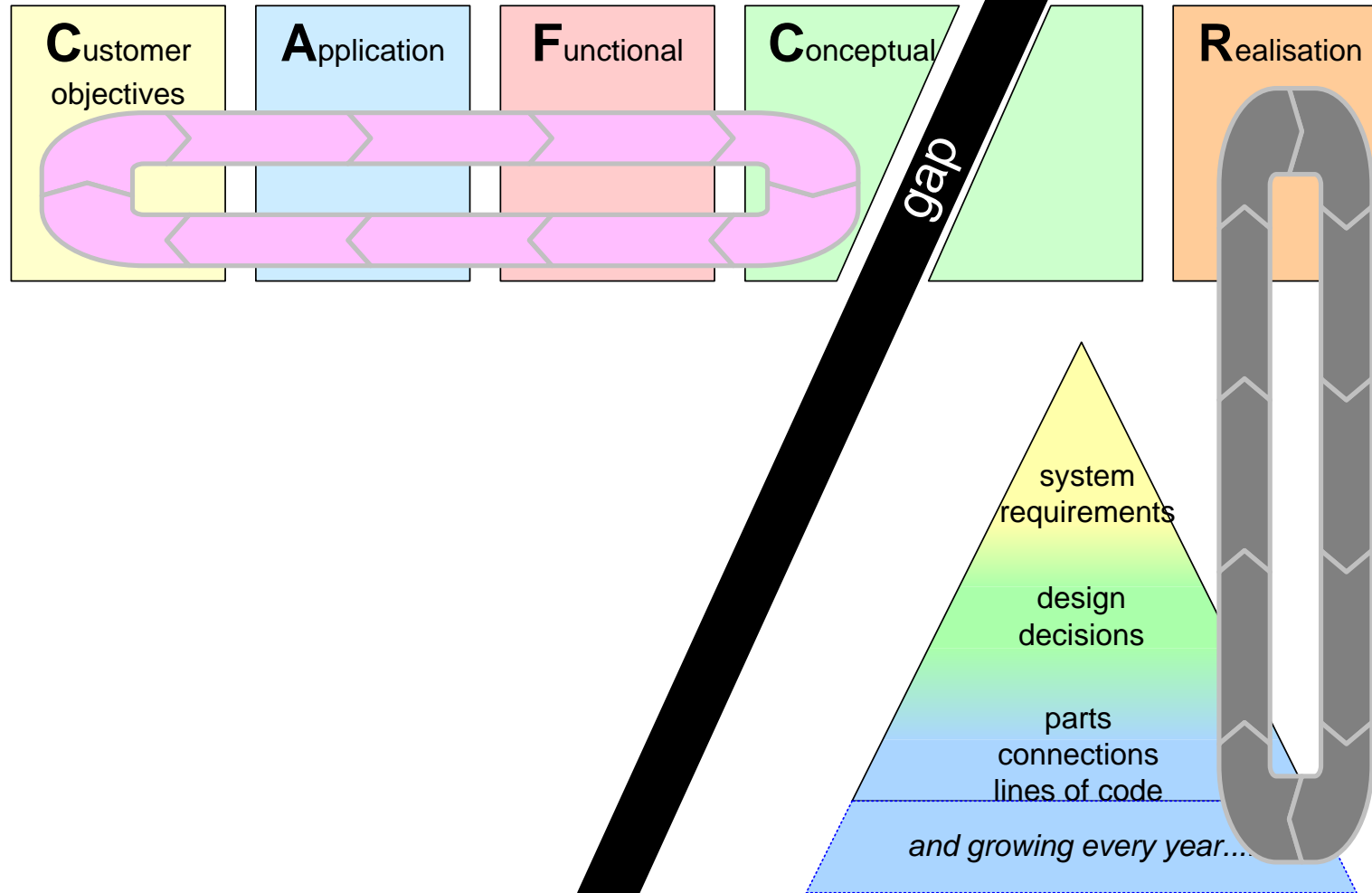
However, different didactic process

# Why, what do we assume?

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# Problem: Disconnect between Breadth and Depth

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

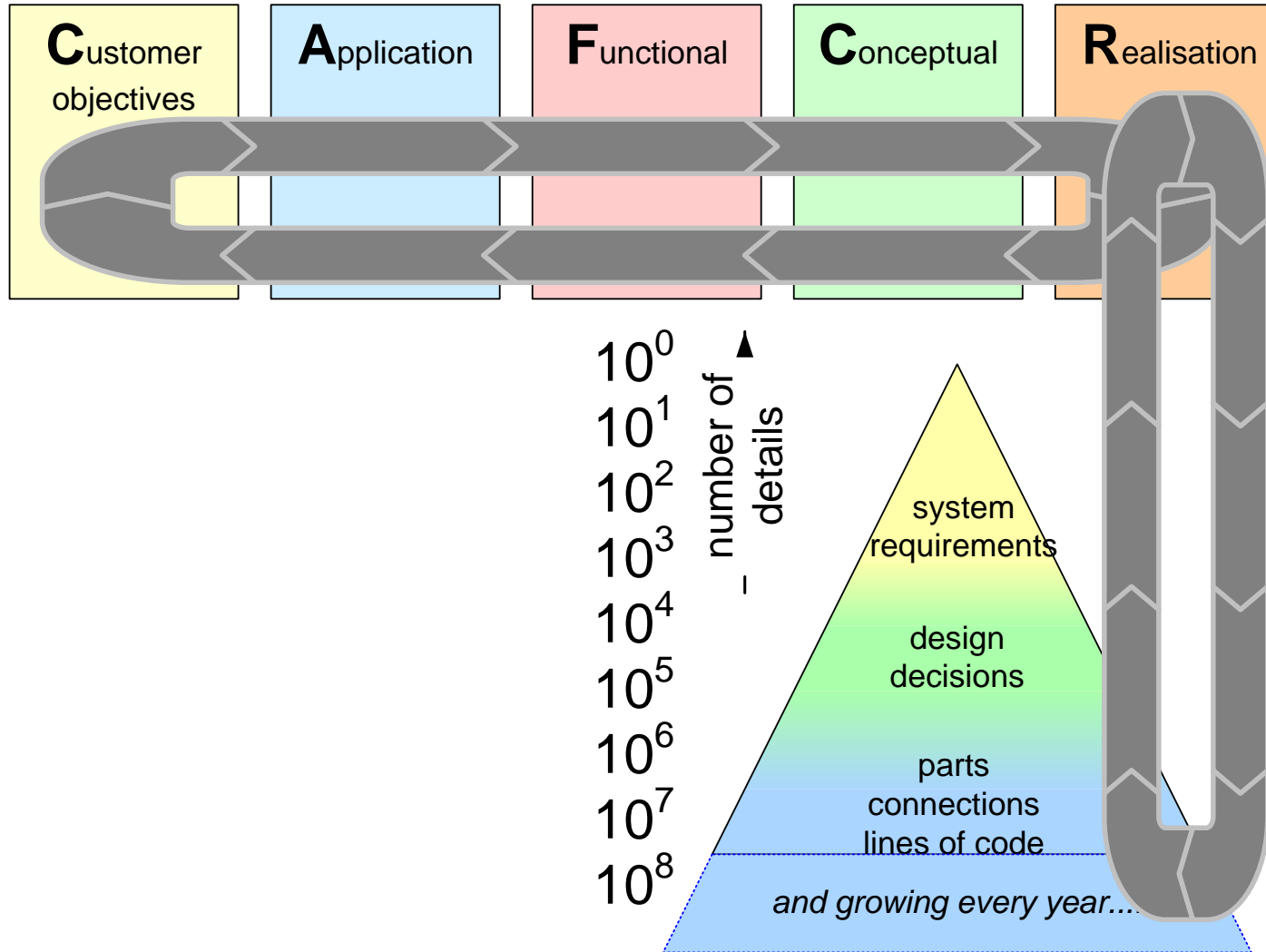


How can the product be realized  
What are the critical decisions

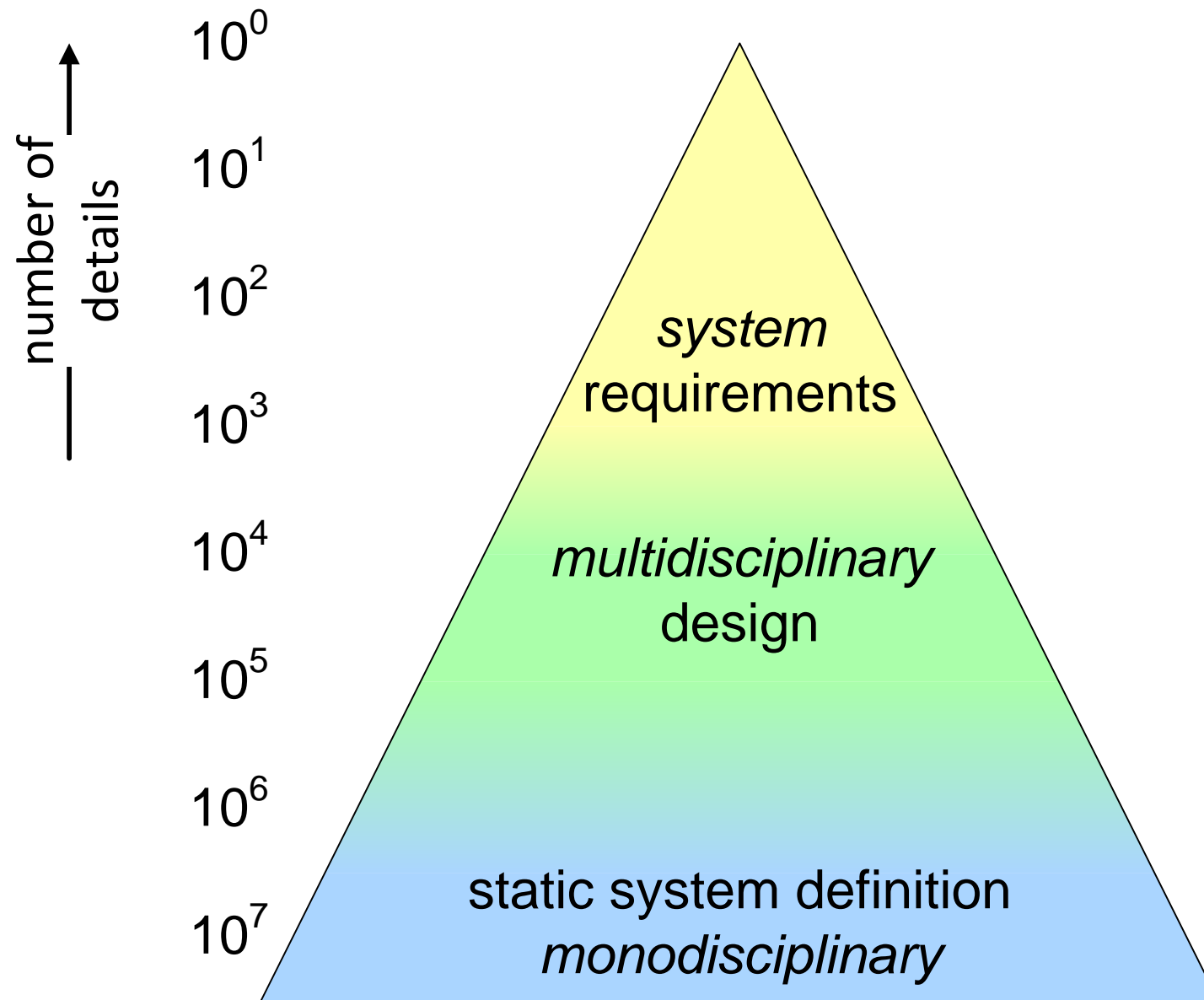
# Assumption 1: Architects form the Hinge

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

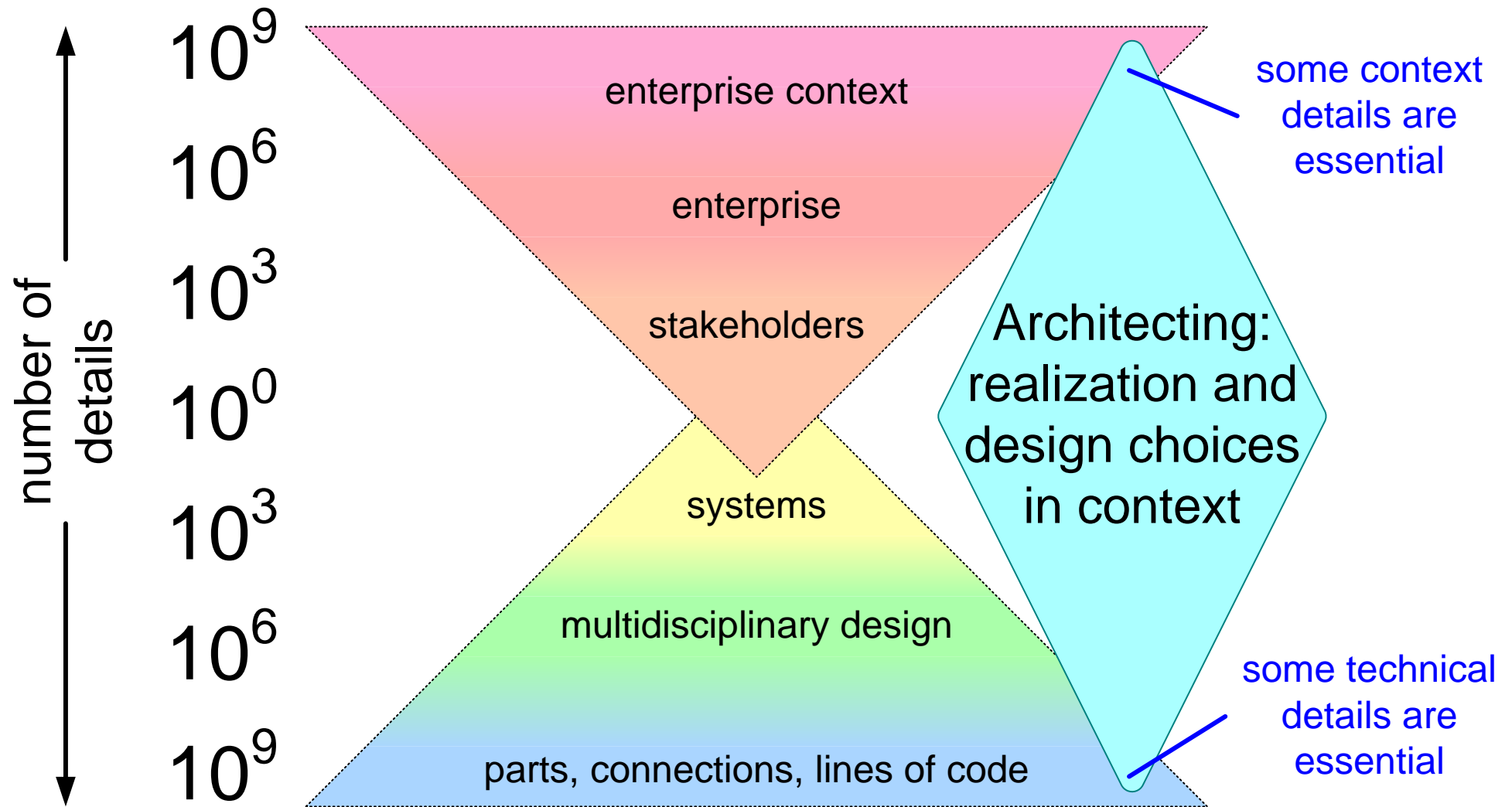
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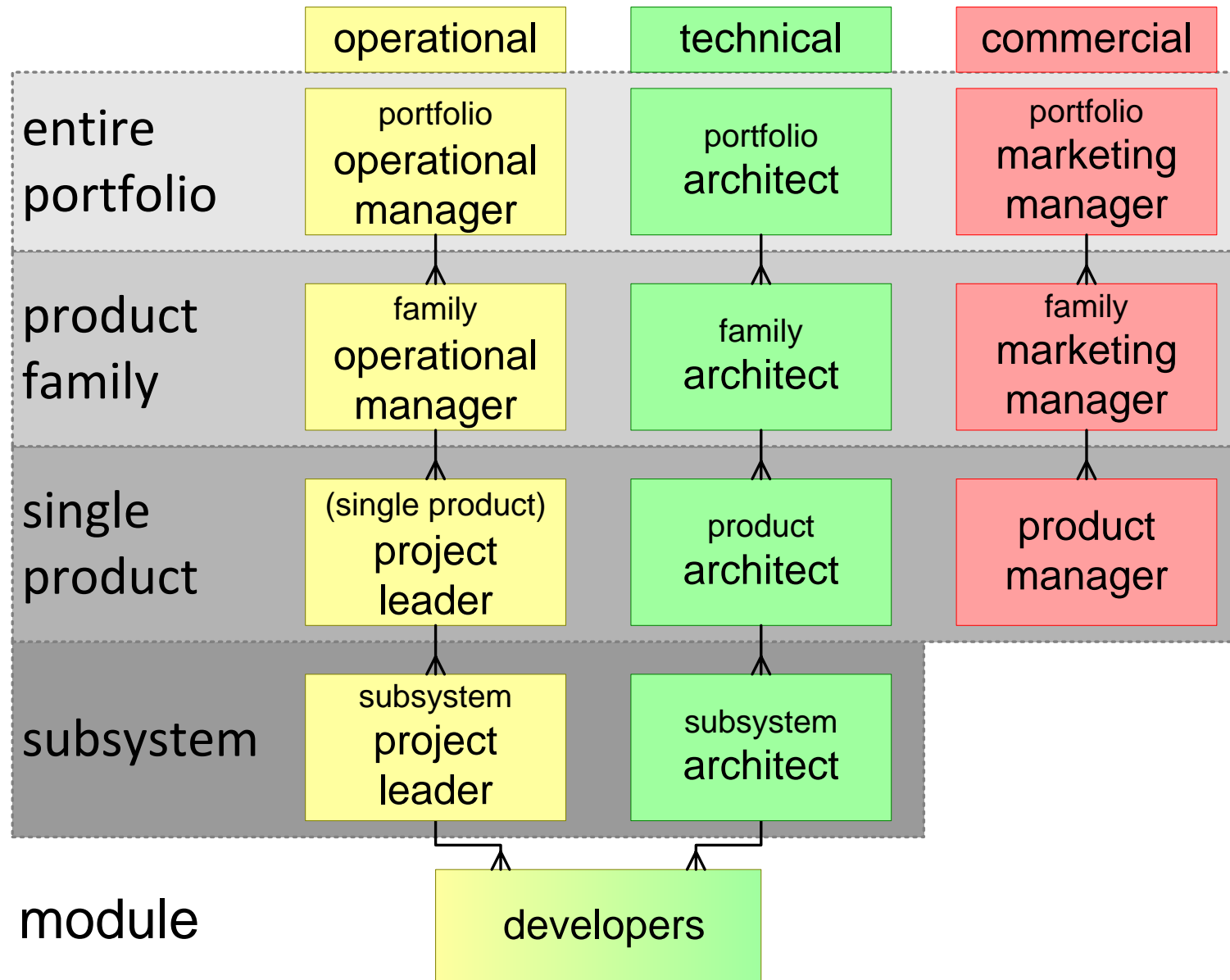
# Level of Abstraction Single System



# Assumption 2: Architecting at Multiple Levels of Abstraction



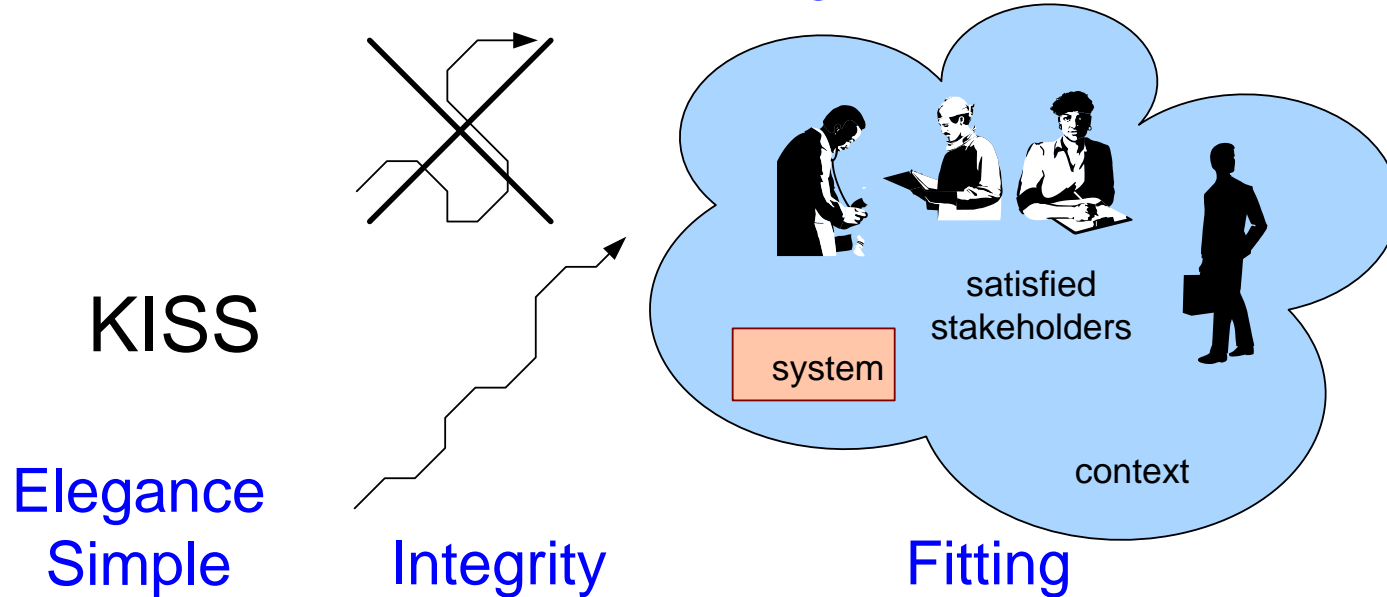
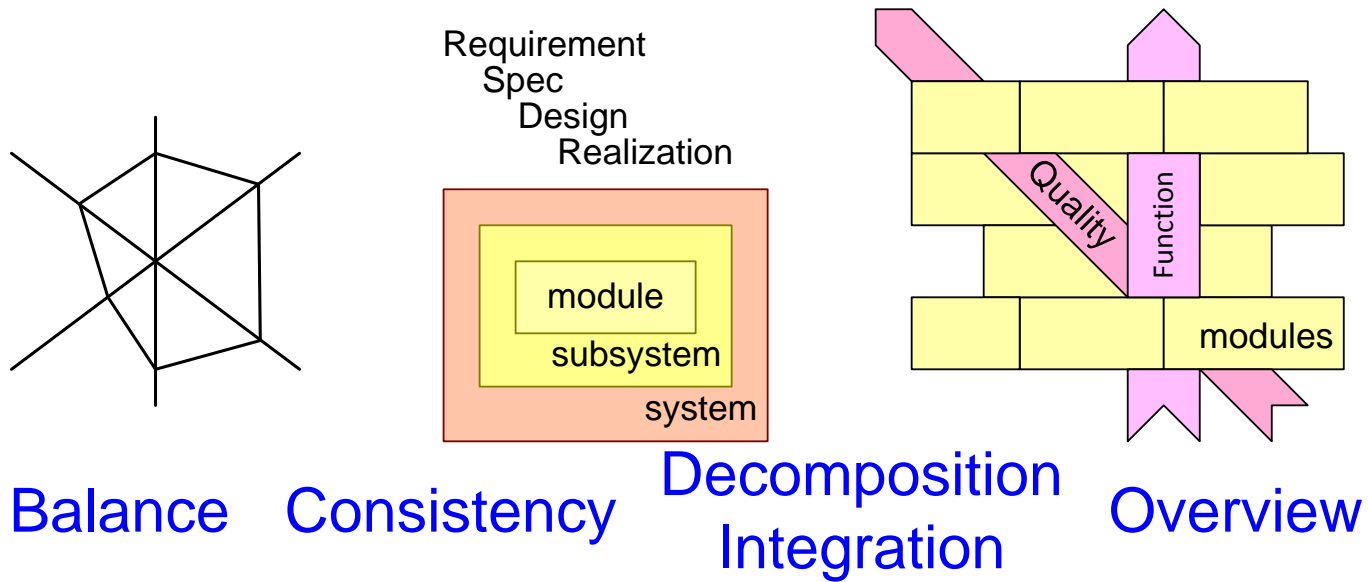
# Assumption 3: Main Roles in Product Creation



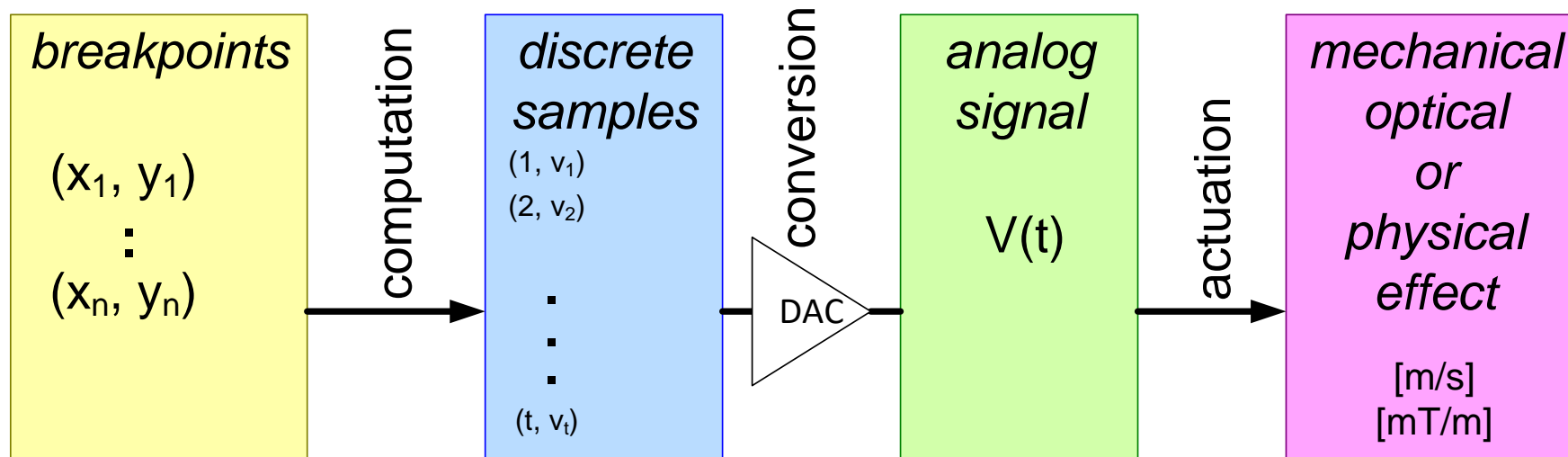
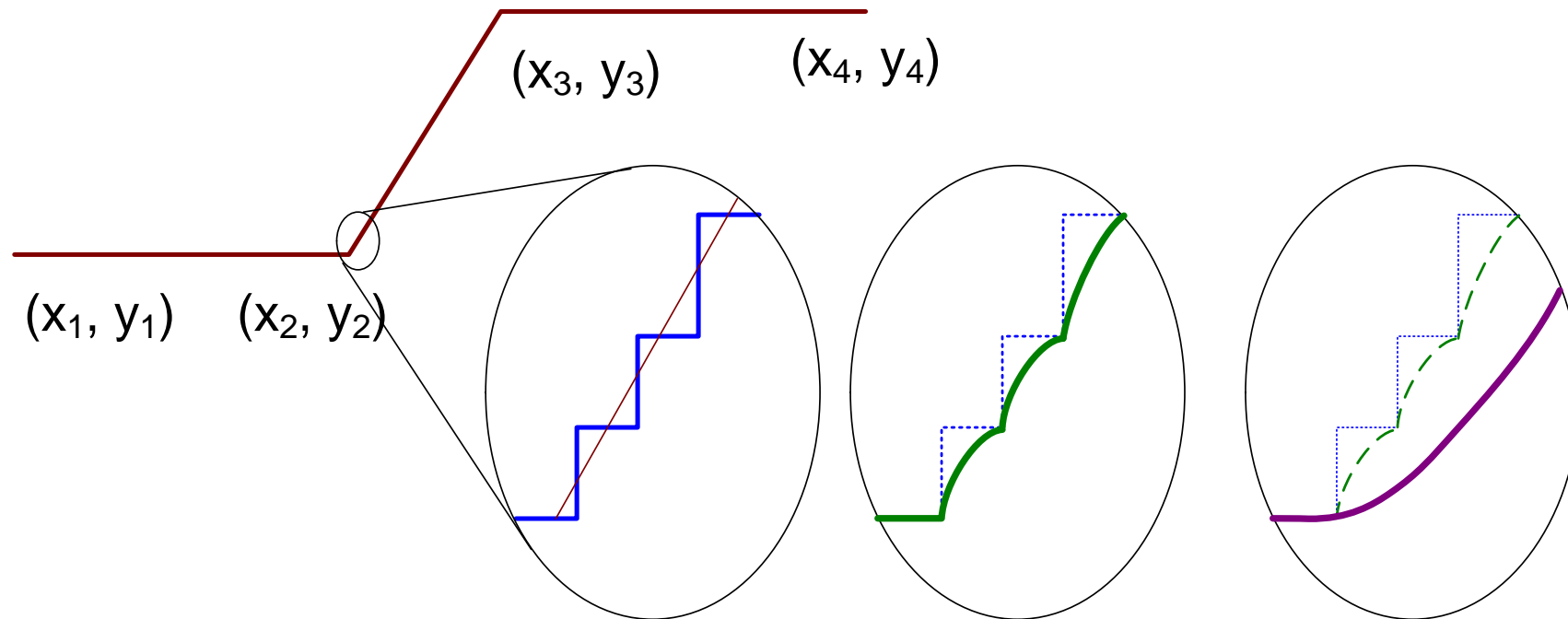
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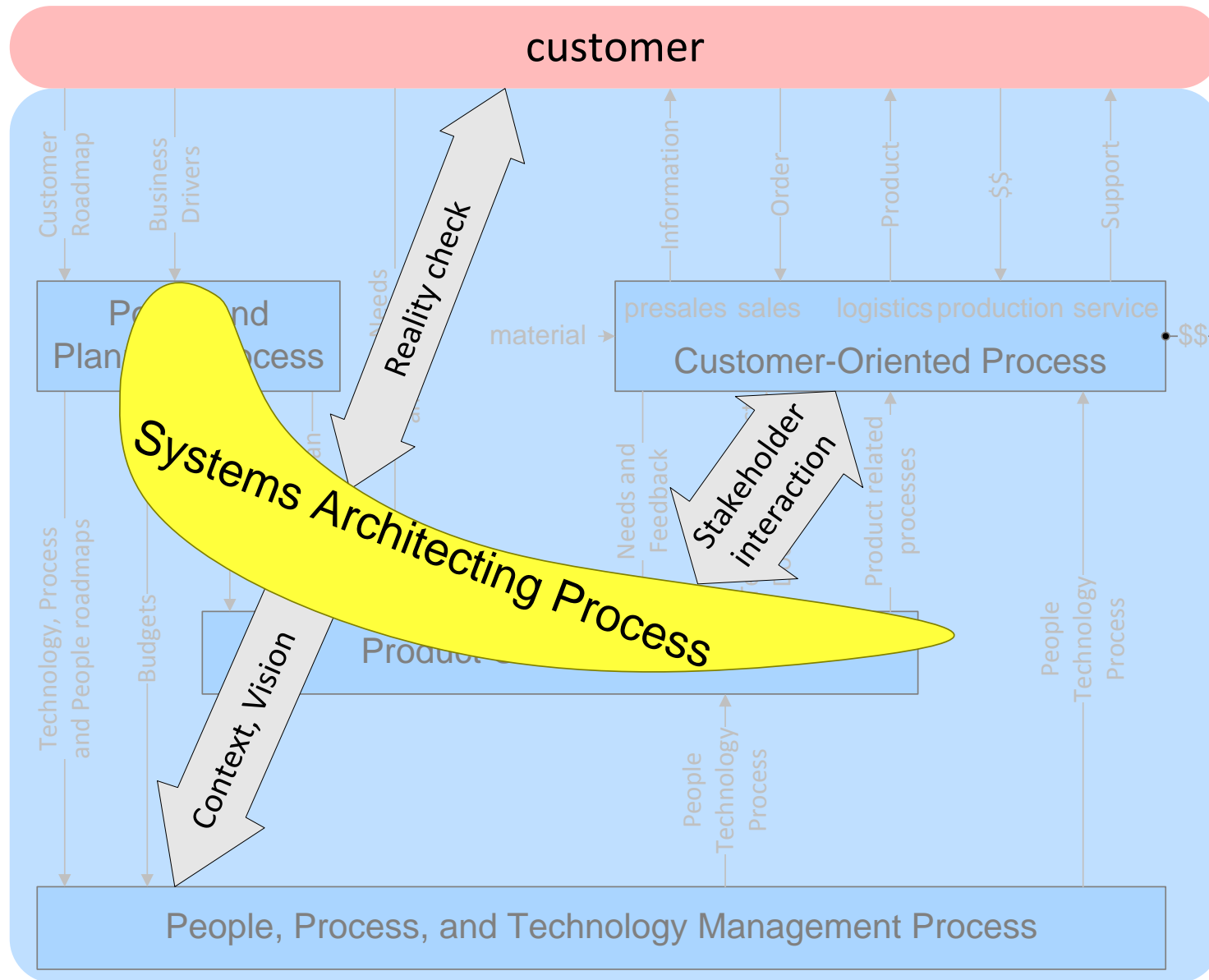
# Responsibilities according SARCH course



# Ability to go Deep where needed



# Participating in Product Creation and Strategy



# Past, where were companies?

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# Disclaimer

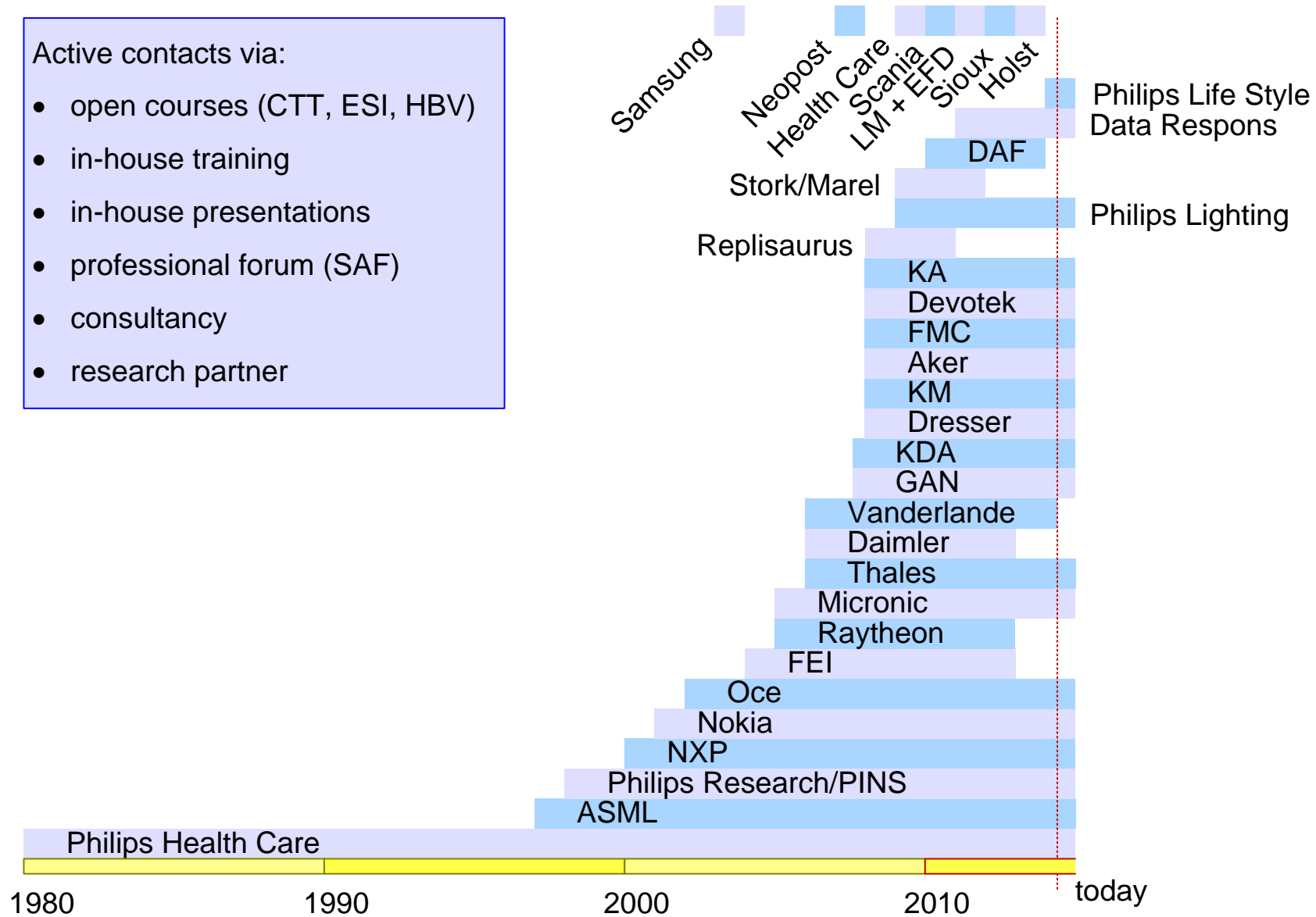
The following analysis is absolutely subjective,  
based on the opinion of a single person.

No academic conclusions can be based  
on the presented data.

# Observations Based on Actual Contacts

Active contacts via:

- open courses (CTT, ESI, HBV)
- in-house training
- in-house presentations
- professional forum (SAF)
- consultancy
- research partner



## mostly missing marketing:

- market research
- strategy

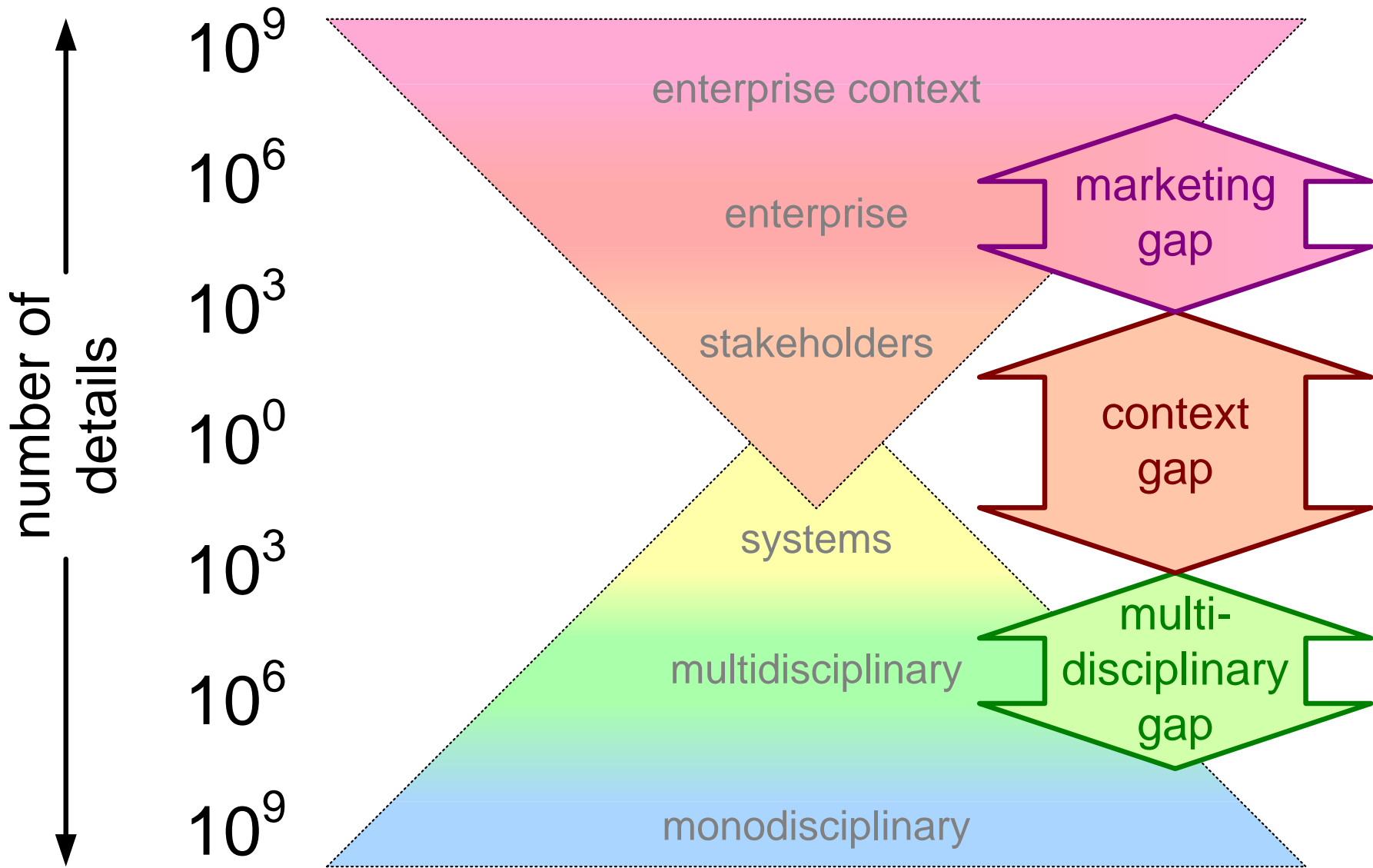
## ill-understood systems architecting:

- confused with requirements engineering
- confused with project management
- confused with best mono-disciplinary engineer

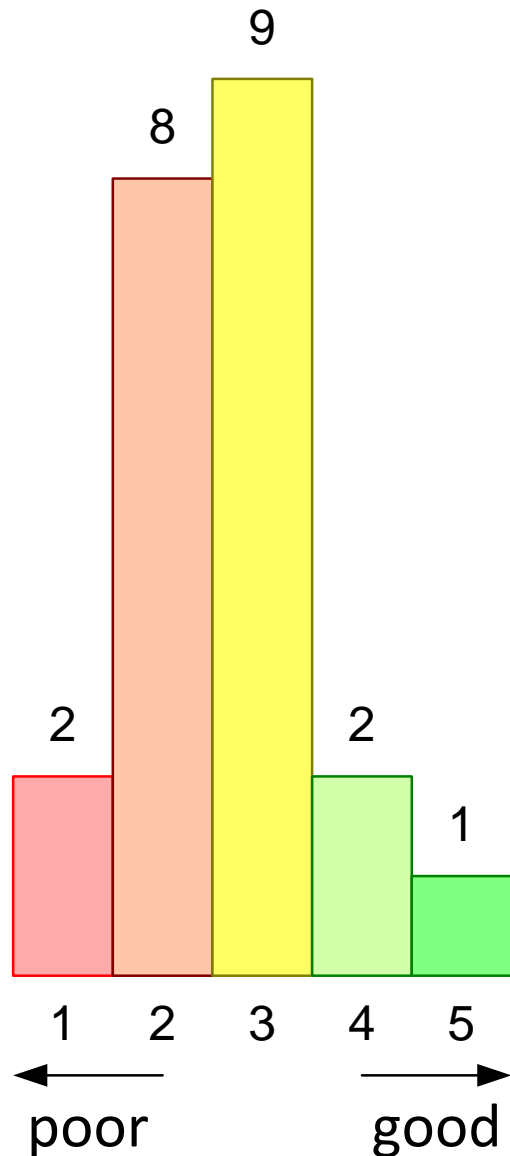
## dominant engineering management

- project management
- monodisciplinary engineering
- specification, product data, configuration, changes, problems management

# Frequently observed gaps



# The Data behind the Statements

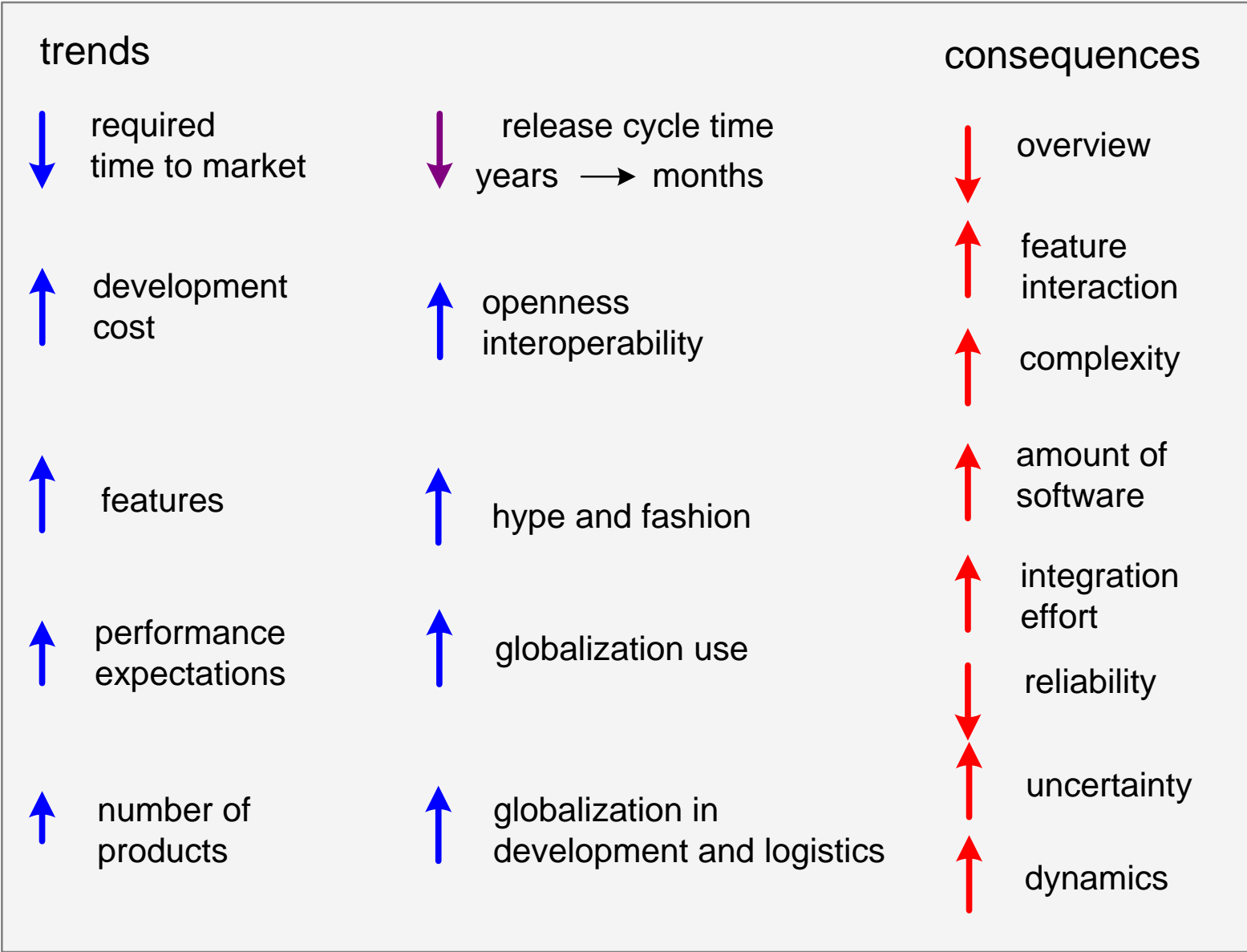


1:  
focus on components or mono disciplines;  
no understanding of “system”

3:  
there are individuals fulfilling the systems  
role, and being effective despite the  
organization. Organization mostly blind for  
“system” needs and value

5:  
systems architects at key position,  
recognized in organization, effective in  
leading development

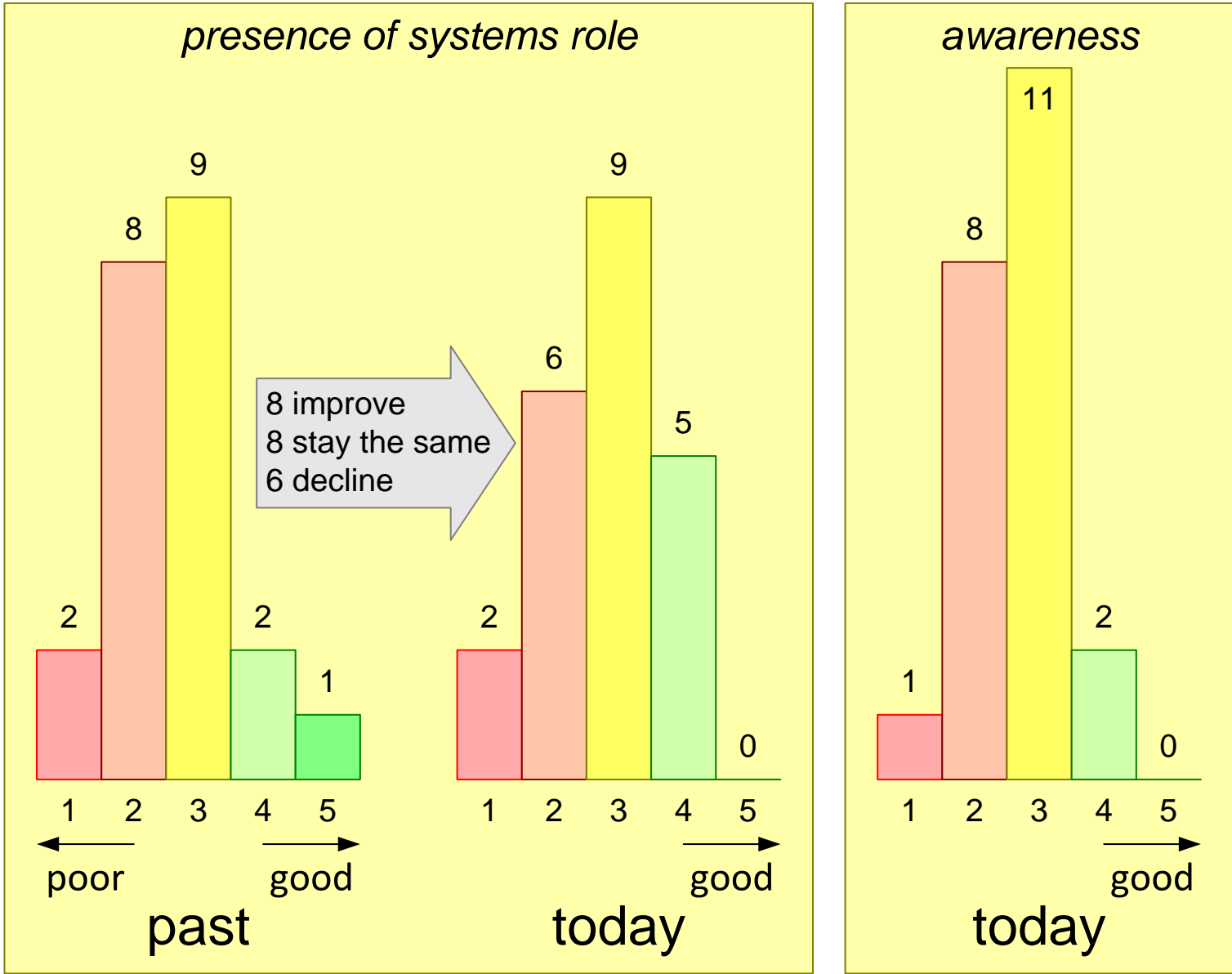
# Need for Architecting is Increasing!



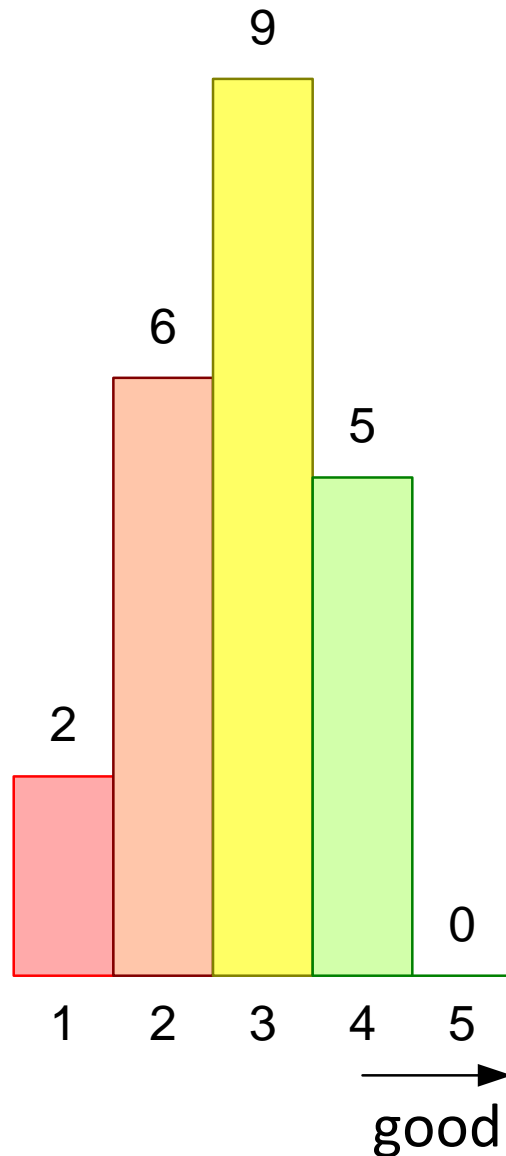
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Why are we in this state?		that is the question 😊
Future what and how to teach?		

# Presence and Awareness of Systems Role



# Some Observations



- product-oriented companies score higher than project-oriented companies ( $\sim\frac{1}{2}$  point)
- Dutch companies (dominatingly product) score better than Norwegian (where projects dominate) ( $\sim\frac{1}{2}$  point)
- There seems to be a slight correlation with size large, e.g. 1000+ engineers, score  $\sim 0.4$  better than medium size, which score  $\sim 0.4$  better than small, e.g. 100- engineers

# Why are we in this state?

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# Some Reasons for Stagnation

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architects typically are INTPs:

- their Introverted nature limits them
- their analytical skills limit them
- the need for solid answers limits them

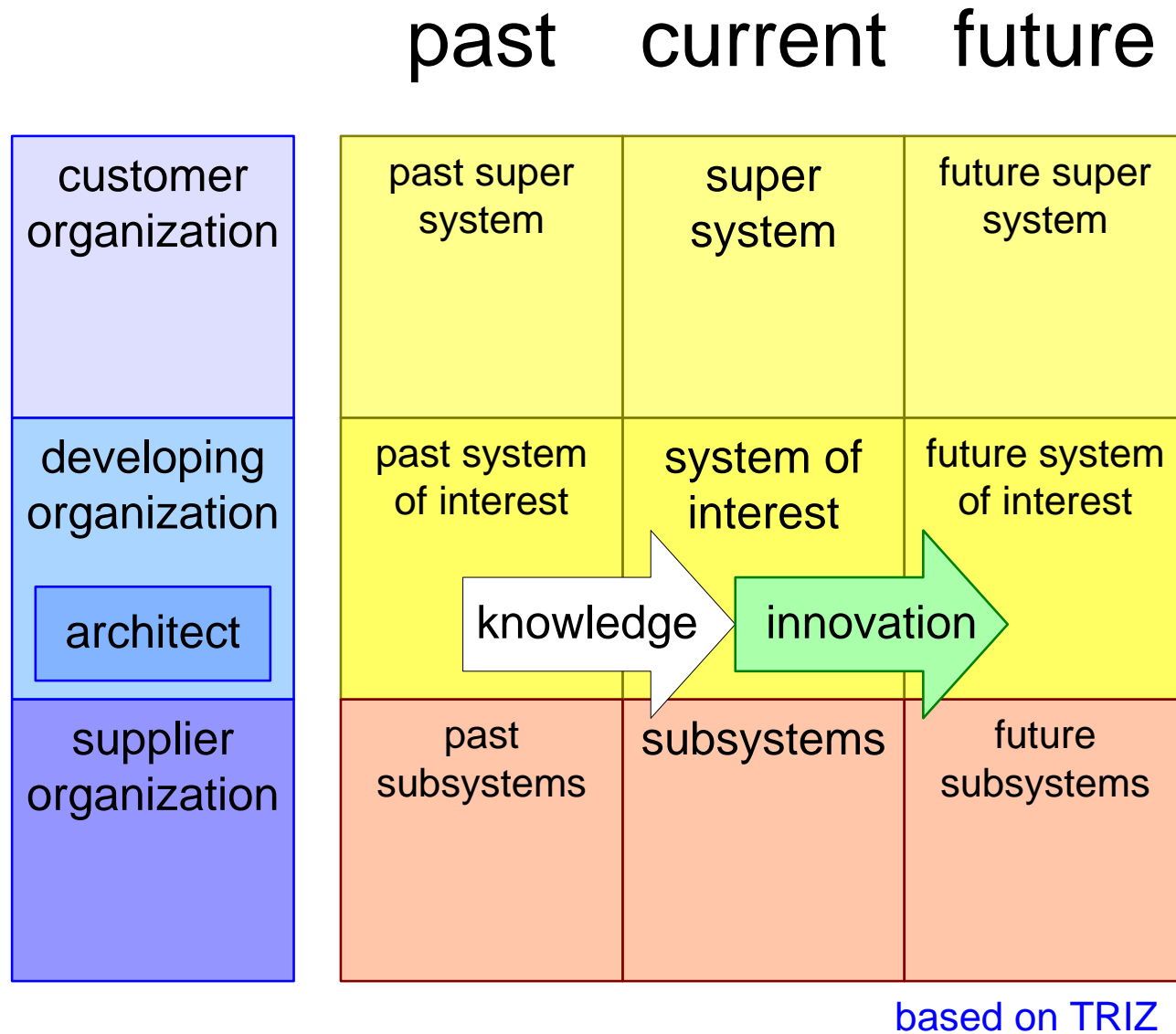
managers live in a control world:

- with an anglosaxon short-term culture
- a belief in KPIs (derived from “measuring is knowing”)
- and a political context

How can we

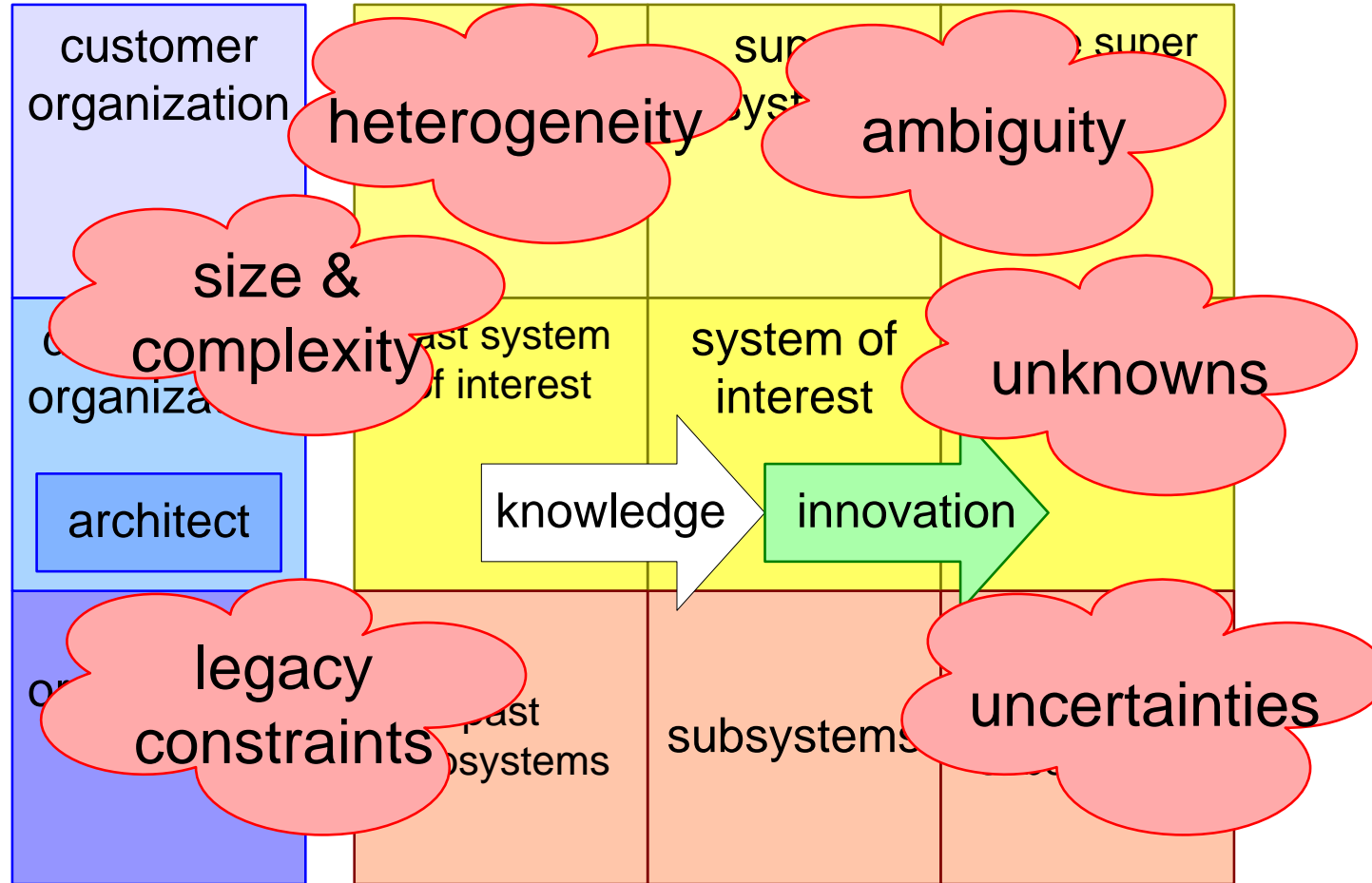
- help architects to become more visible and confident?
- help managers to understand architectst, architecting, and architectures so that they can coach (potential) architects?

# The Playing Field



# and its Main Challenges

past    current    future



based on TRIZ

# Future what and how to teach?

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# What is Competence?

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Attitude (perseverance, faith, critical, constructive, etc.)

*train*

Ability (know when to use what skill and knowledge)

*apply/use often, experience*

Skills (calculate missing angle, calculate hypotenusa)

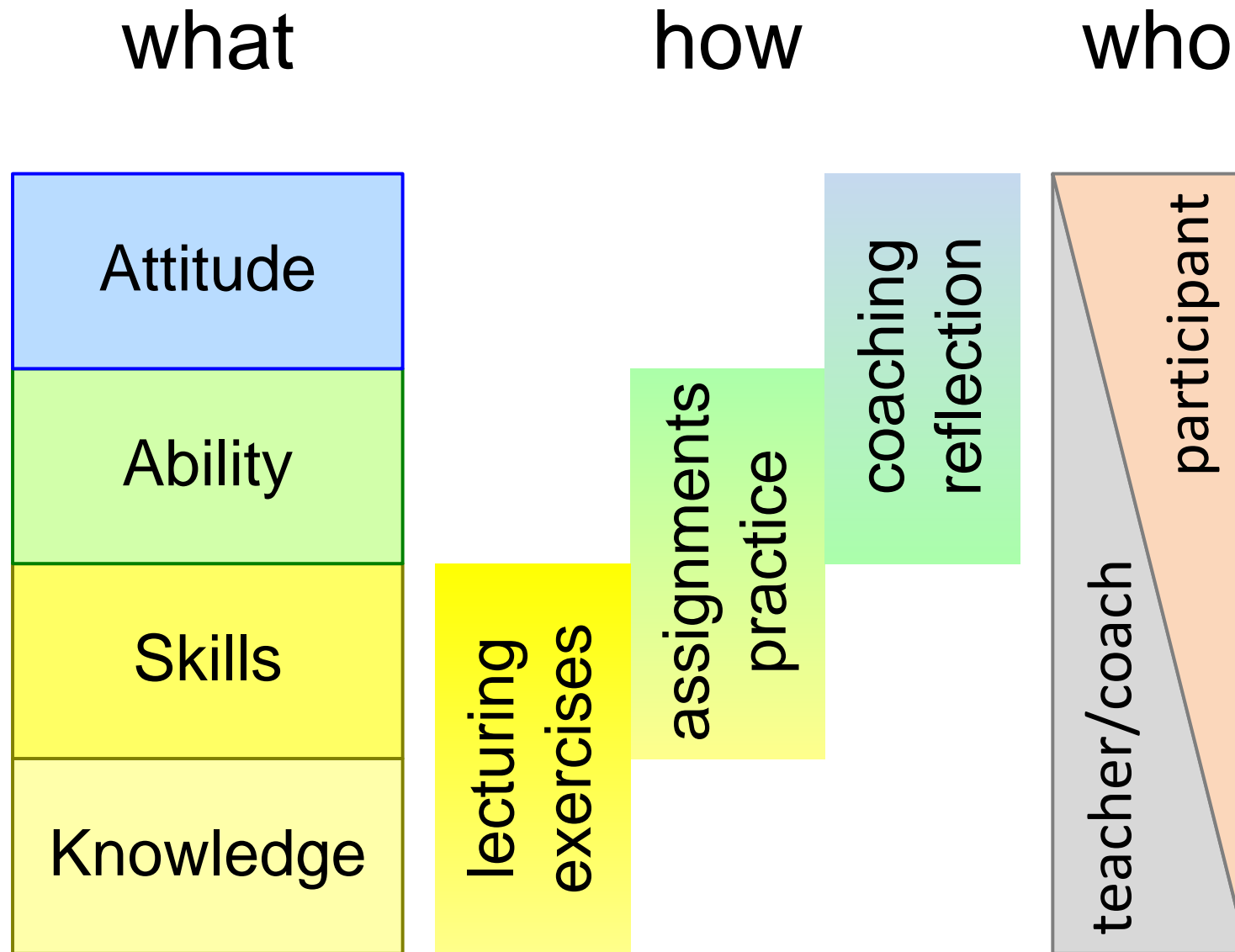
*exercise*

Knowledge (triangle has 3 corners, sum of angles is 180 degrees, Pythagoras  $c^2 = a^2 + b^2$ )

*learn*

Competence = Knowledge + Skills + Ability + Attitude

# Competence Program Partitioning



“hard” technical  
lectures, courses, workshops

case  
practice, management involvement

“soft” psycho social  
workshops

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Today, where are companies?	small improvement “good” 3 → 5 (of 22)	
Why are we in this state?	architect profile managerial context	
Future what and how to teach?	balance of “hard” and “soft” teaching, doing, reflecting	

learning to cope with

- legacy constraints
- size & complexity
- heterogeneity
- ambiguity
- unknowns
- uncertainties