

What roles of politicians, managers, and systems engineering will be effective in sociotechnical systems?

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Abstract

The functionality that we use as organizations and citizens increasingly arises from a complex interplay of man-built systems, individuals and organizations, and the environment. It is a challenge to get the desired functionality and features consistently, reliably and affordably, without unwanted side effects. This is exactly the role that systems engineers have for classical systems. Who takes on this role for complex dynamic supersystems of people, environment and man-built systems?

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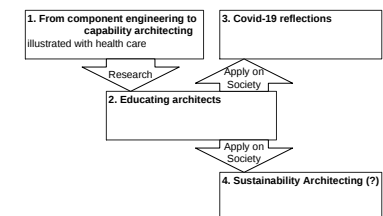
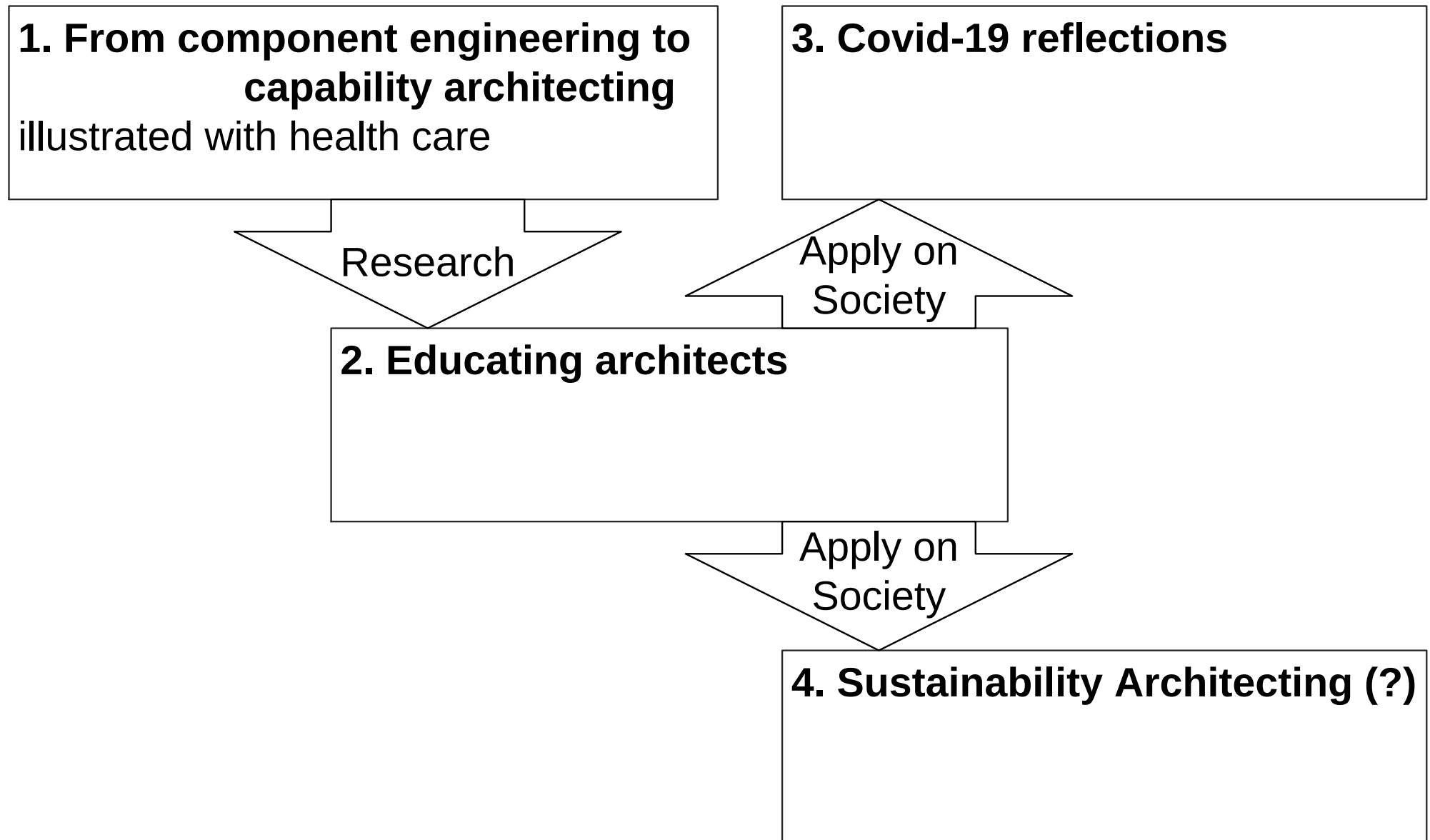
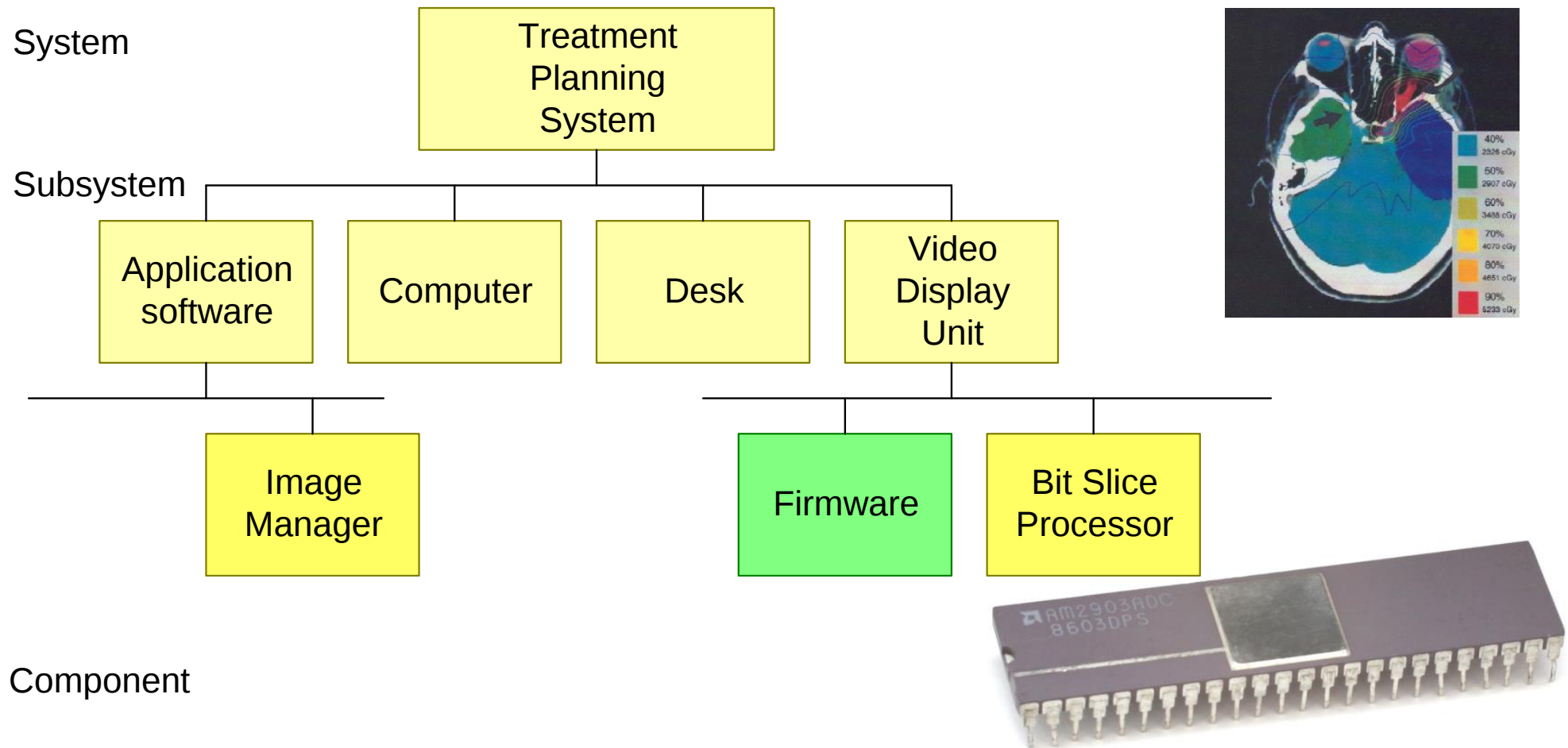


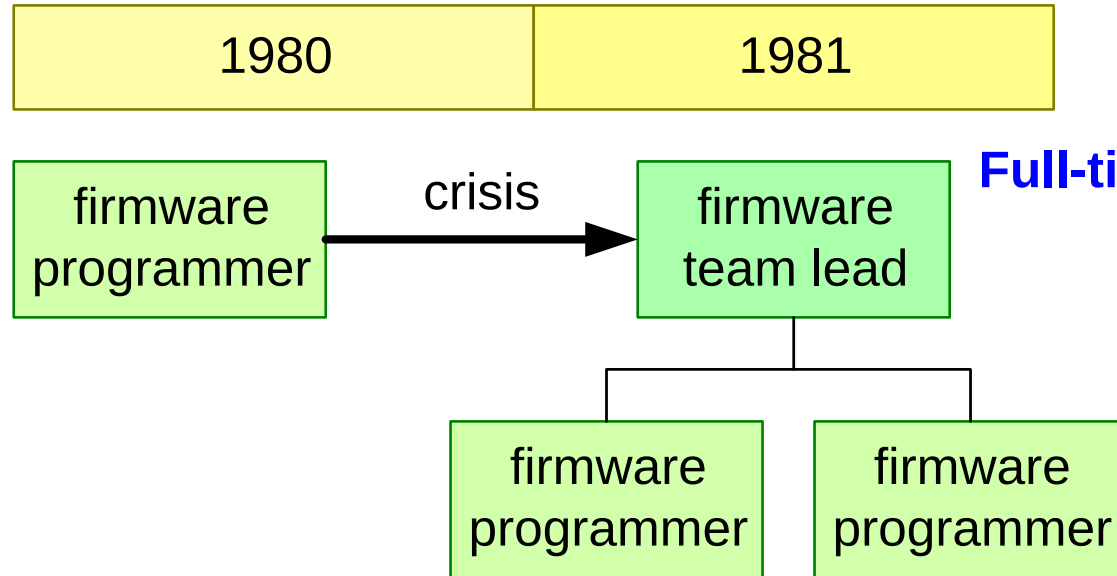
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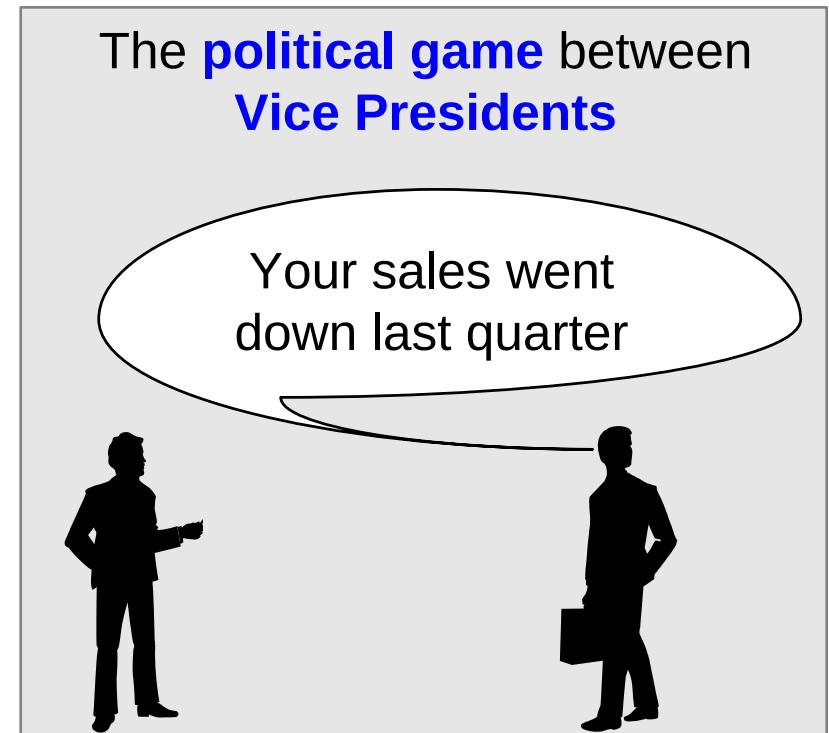
Firmware for Treatment Planning



From programmer to Team Leader

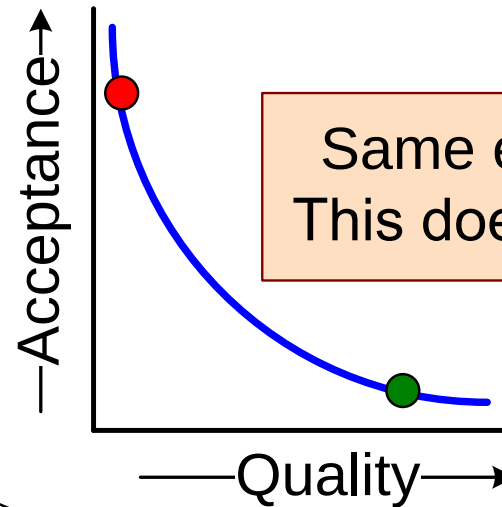
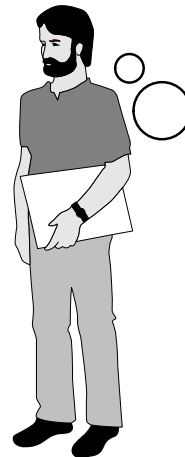


Full-time meeting circus!



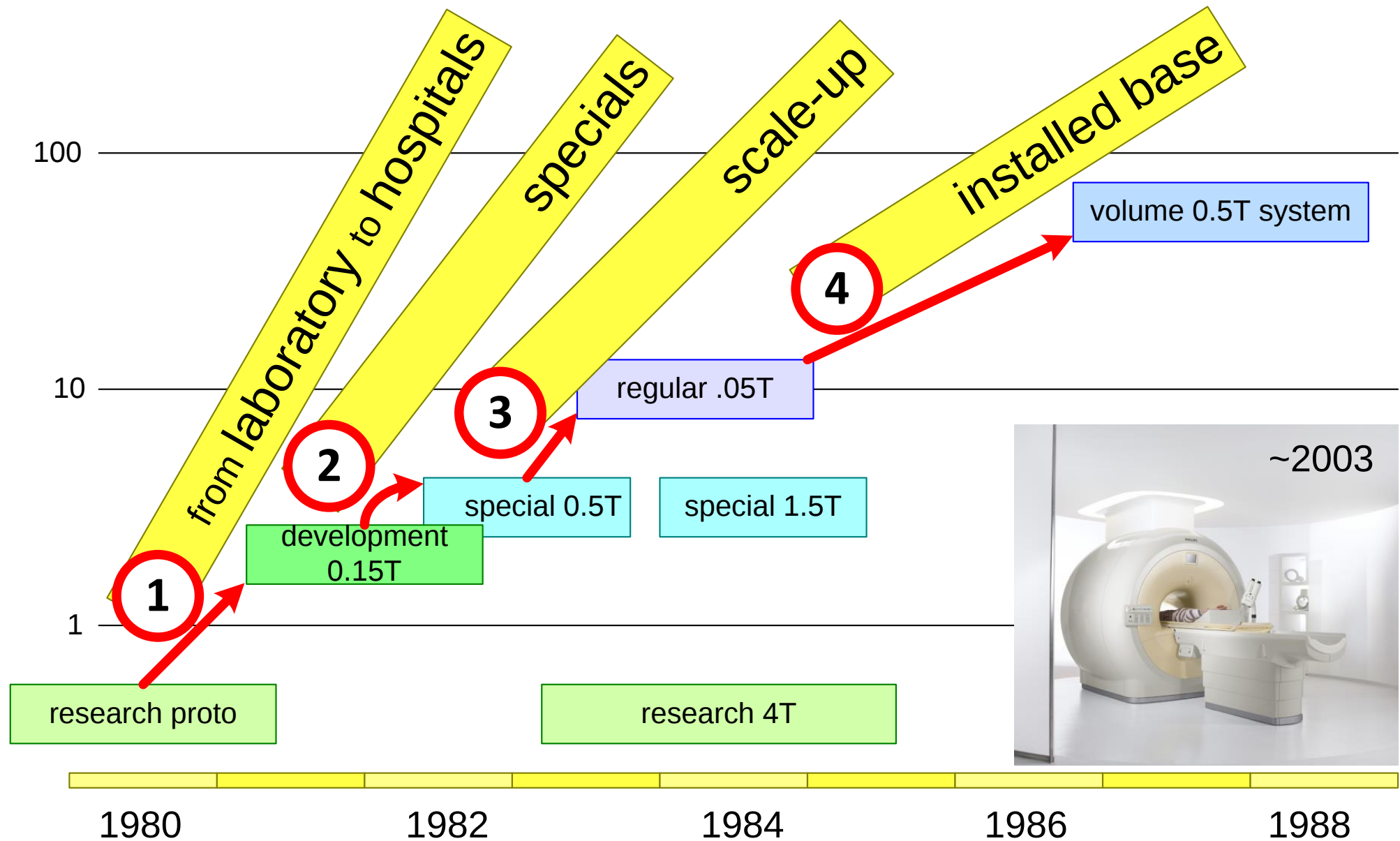
The Organization and Efficiency Expert

Effectiveness =
Quality * Acceptance

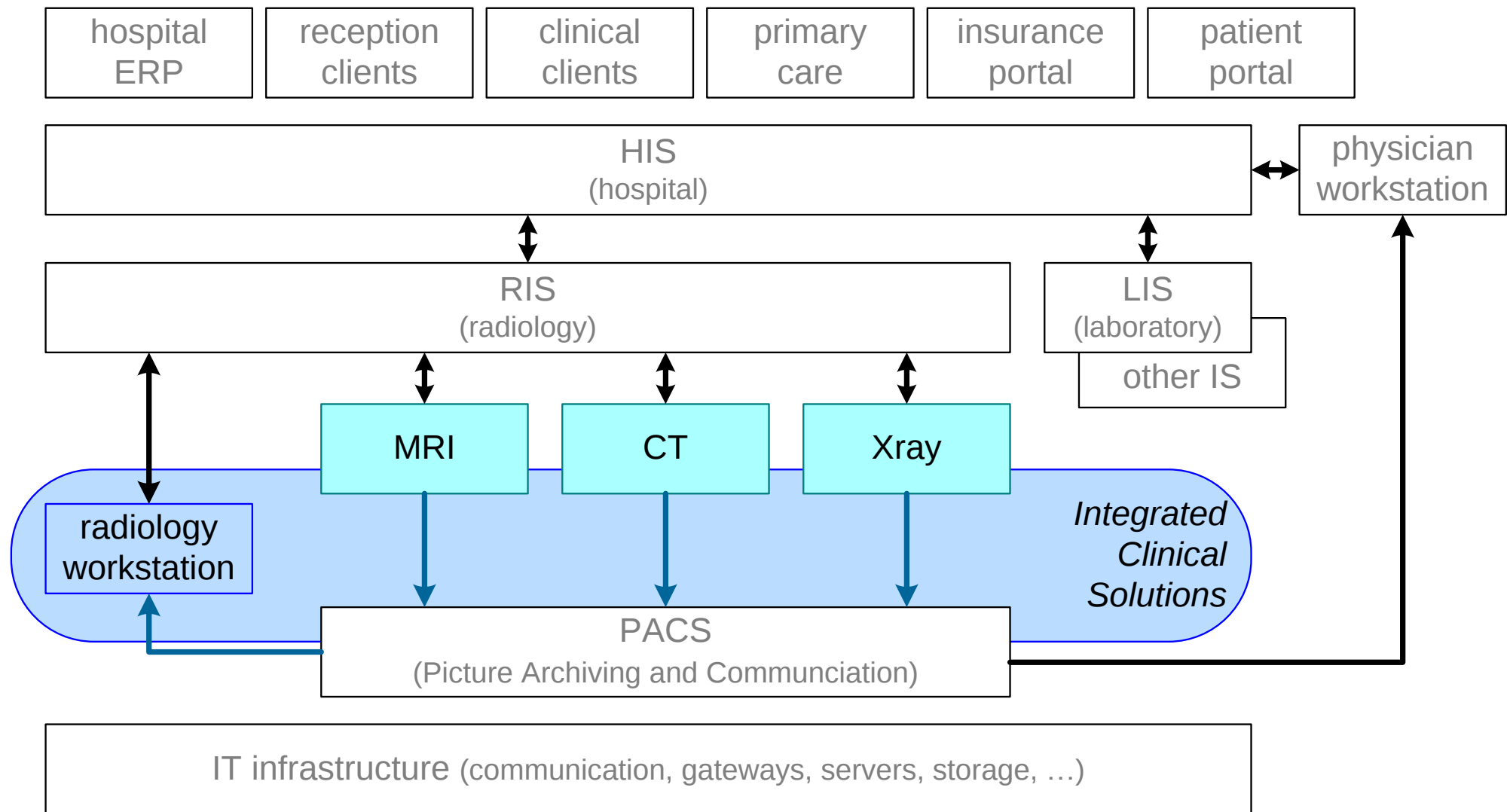


Same effectiveness???
This doesn't make sense!

Architect Scope: The System, Its Application and Life Cycle



Toward Systems of Systems



From: NK-ICT architectuur juryrapport, 2005, special mention:

- *Het verhaal geeft een goed leesbare en toegankelijke beschrijving van de context, de problematiek en de belanghebbenden in de zorgsector.*
- *Een uitzonderlijk groot IT probleemgebied met zijn complexe maatschappelijke en politieke context is teruggebracht tot een compact en begrijpelijk verhaal.*
- *Het doel van de architectuurbeschrijving wordt beschreven: “instrument om te komen tot afstemming met al die partijen”.*
- *De beslissingen en principes worden helder geformuleerd.*

followed by more critical comments

in memoriam of Jan Turk, one of the initiators of the NK-ICT

The Dutch Senate killed the Electronic Patient Record in March 2011

1. From component engineering to capability architecting

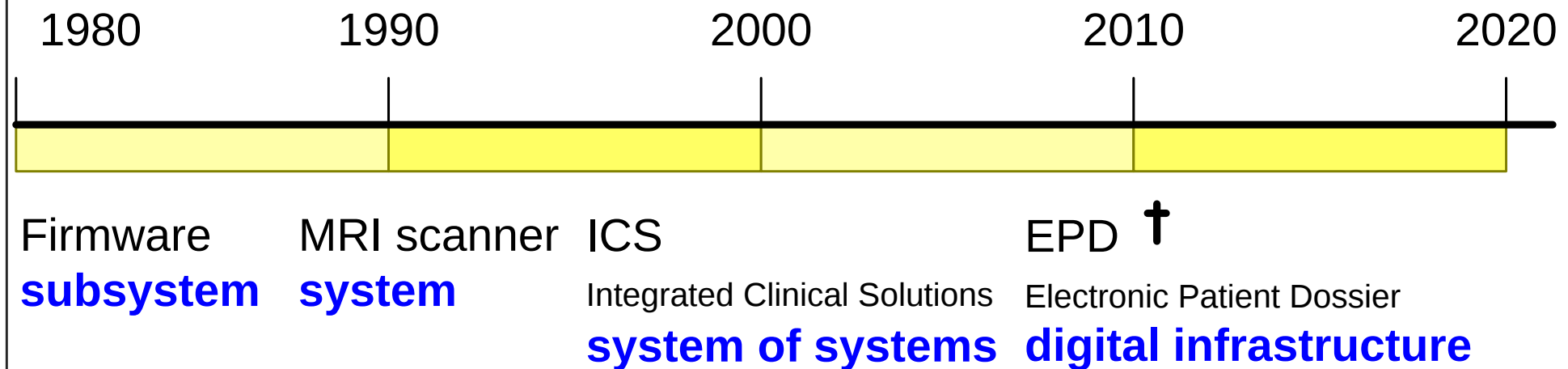
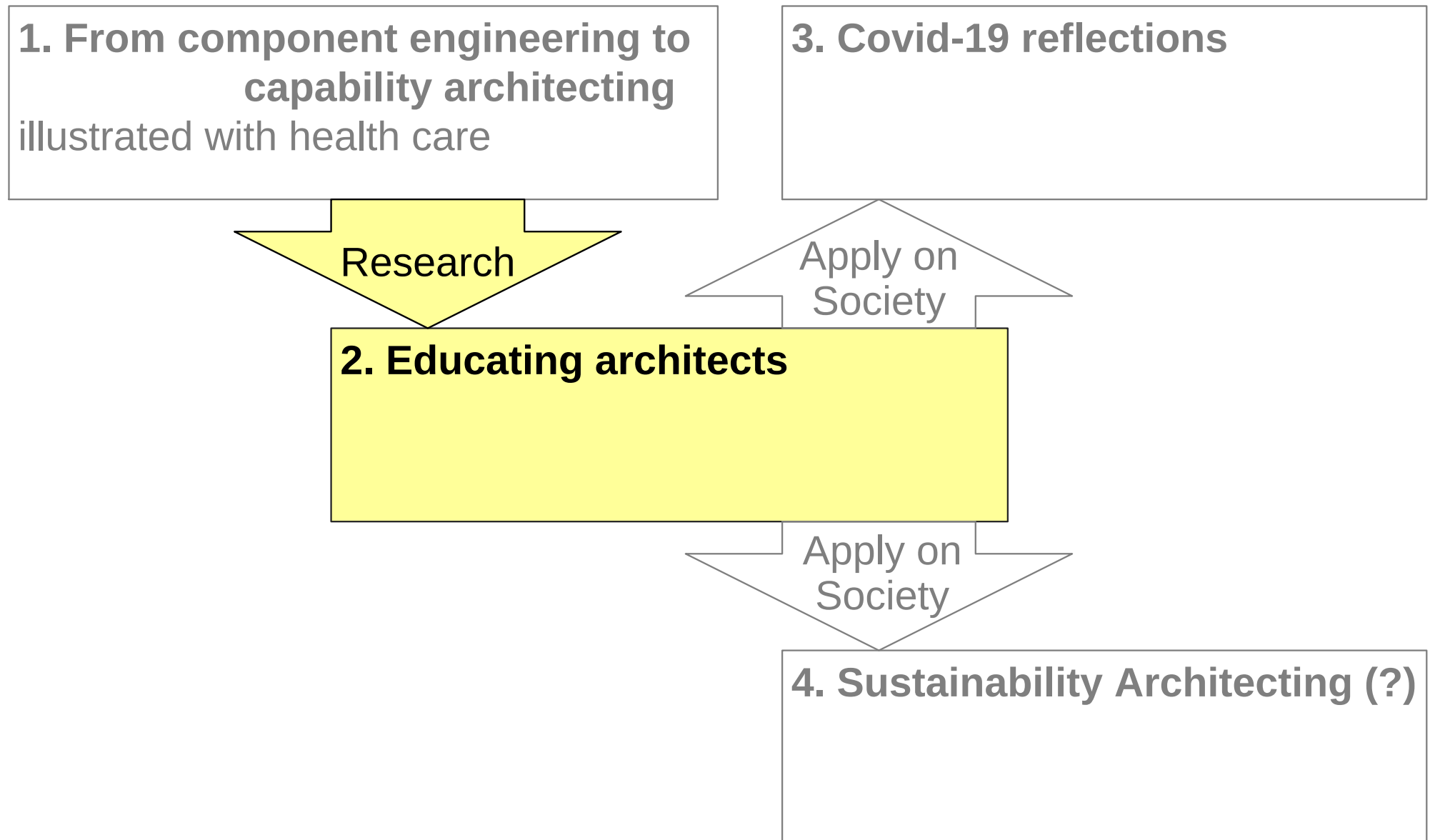
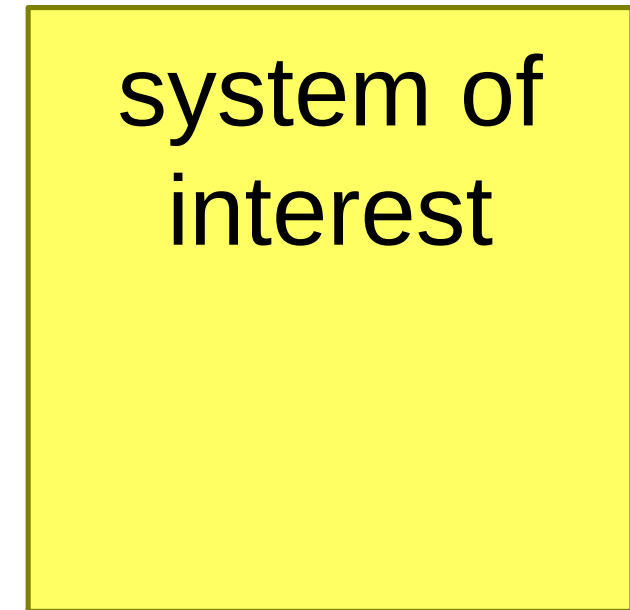


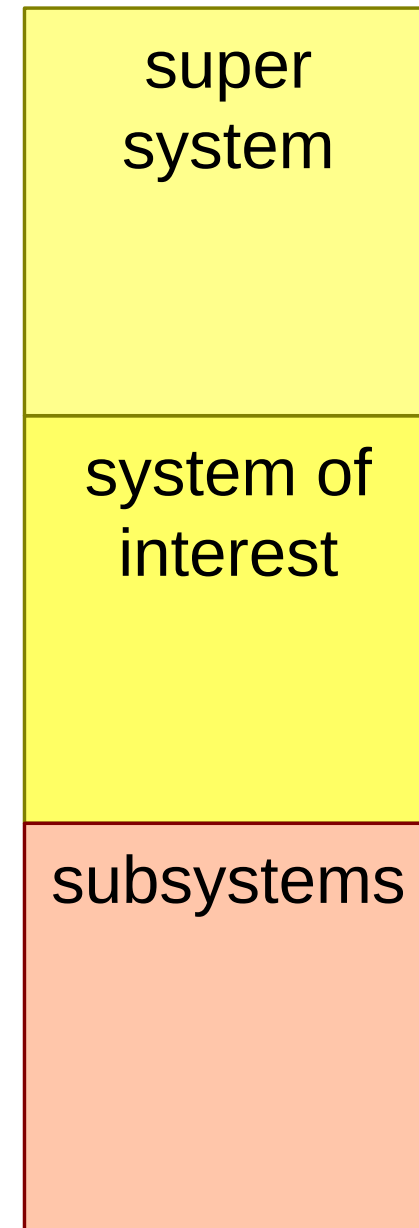
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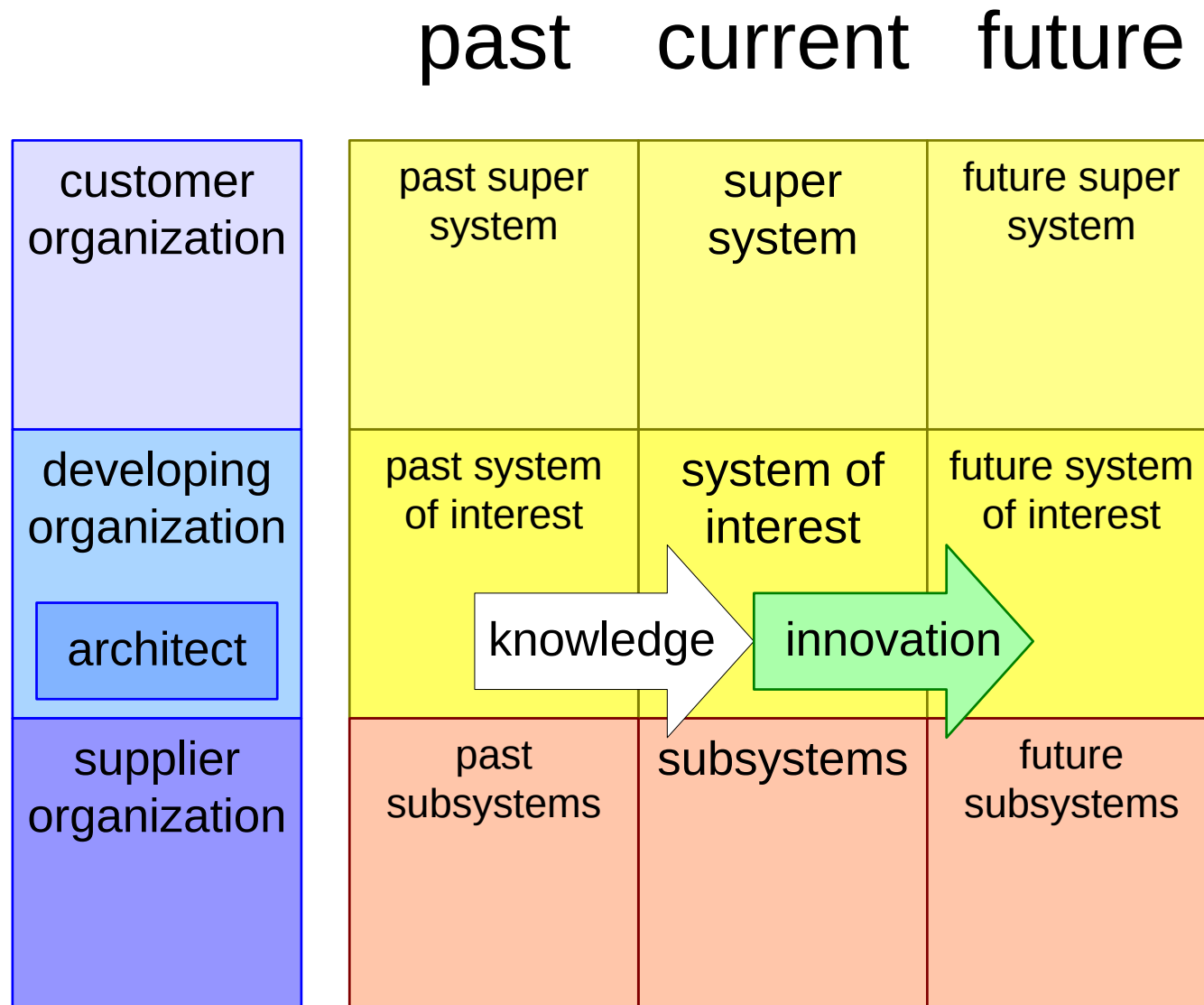
Our Primary Interest



Context, Zoom-out and Zoom-in

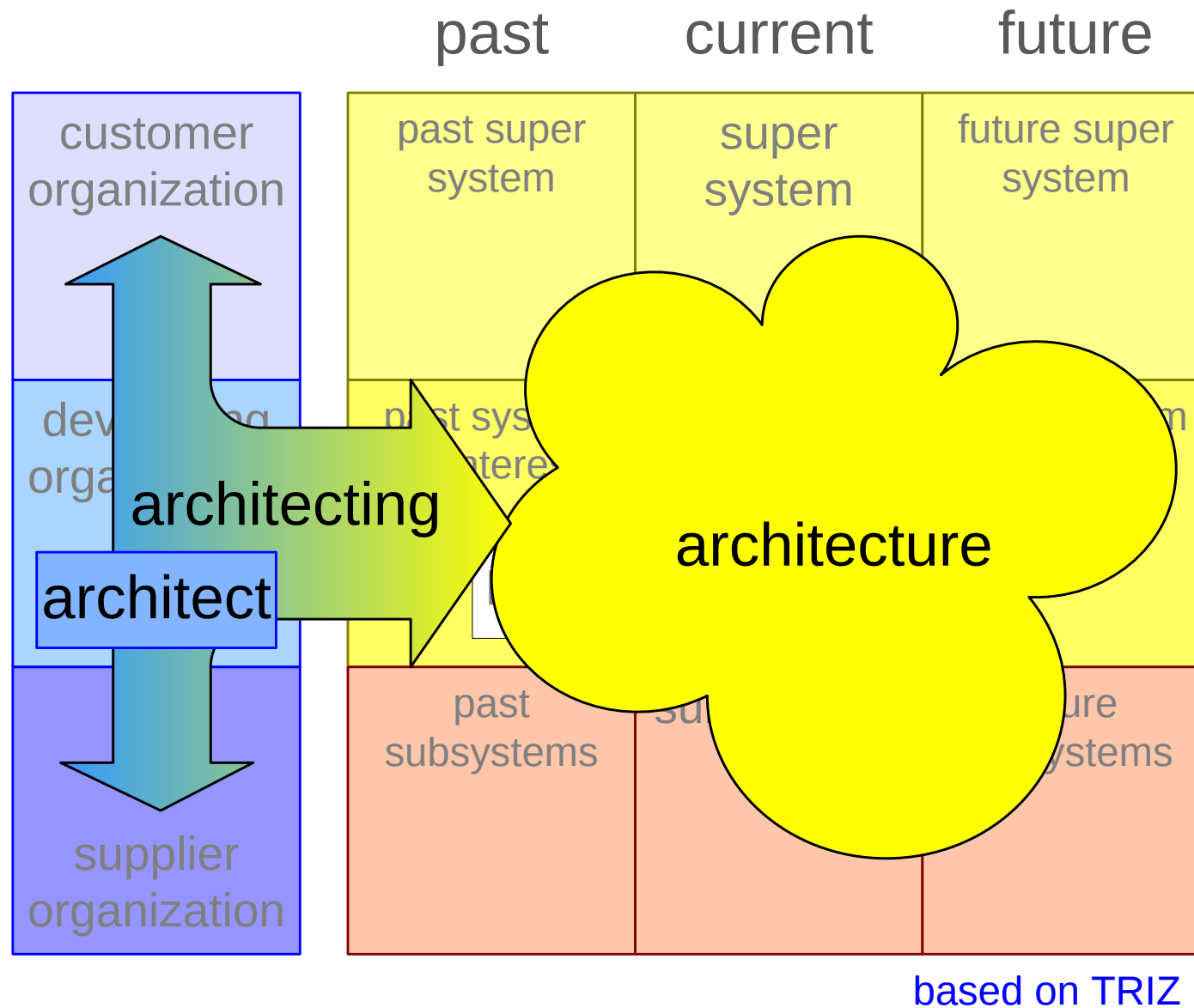


Adding the Time Dimension

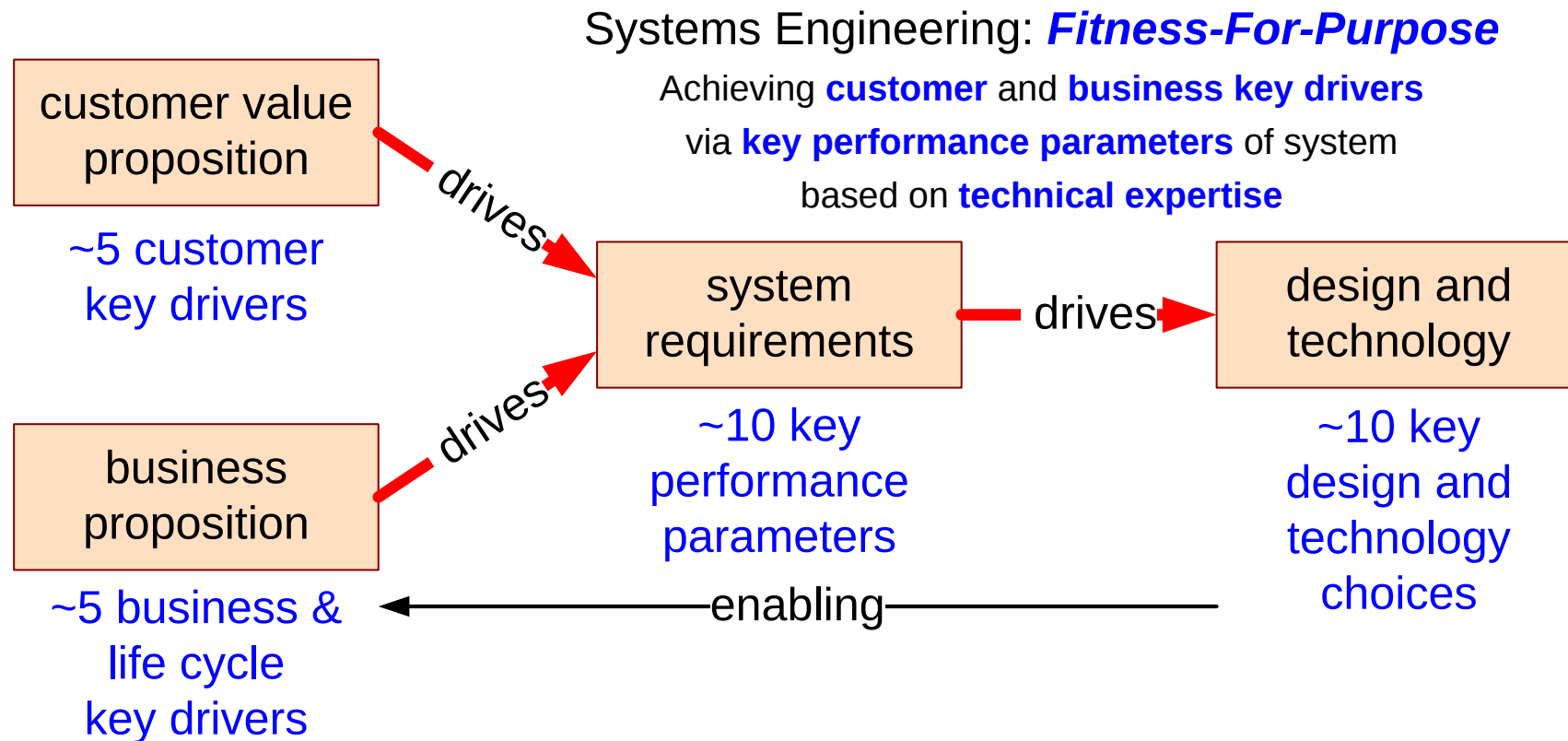
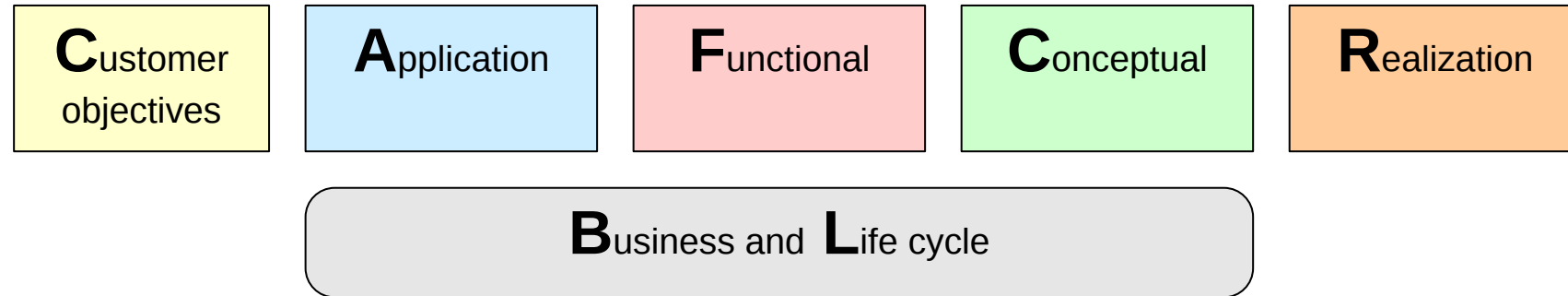


based on TRIZ

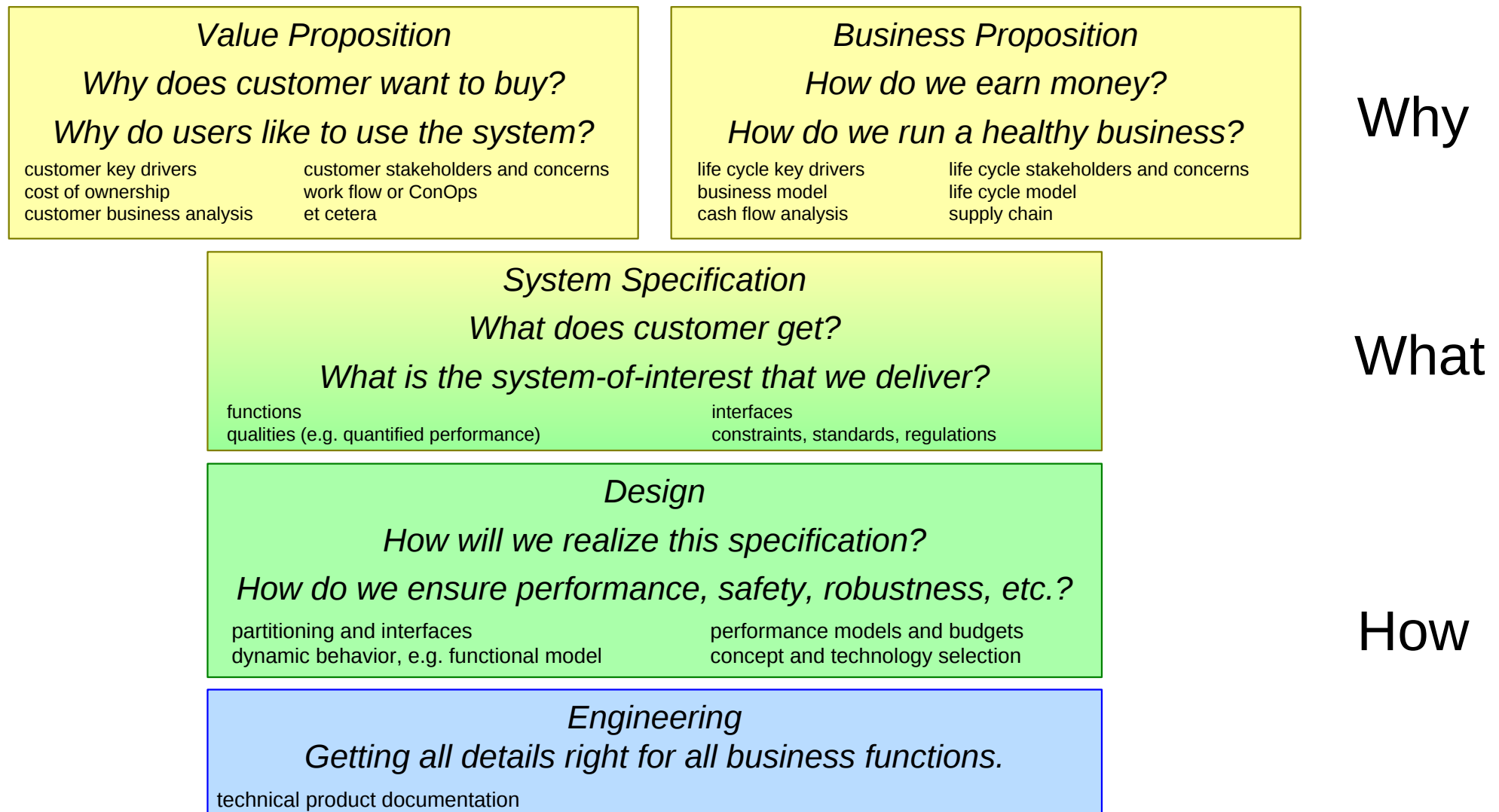
Architect, Architecture, Architecting



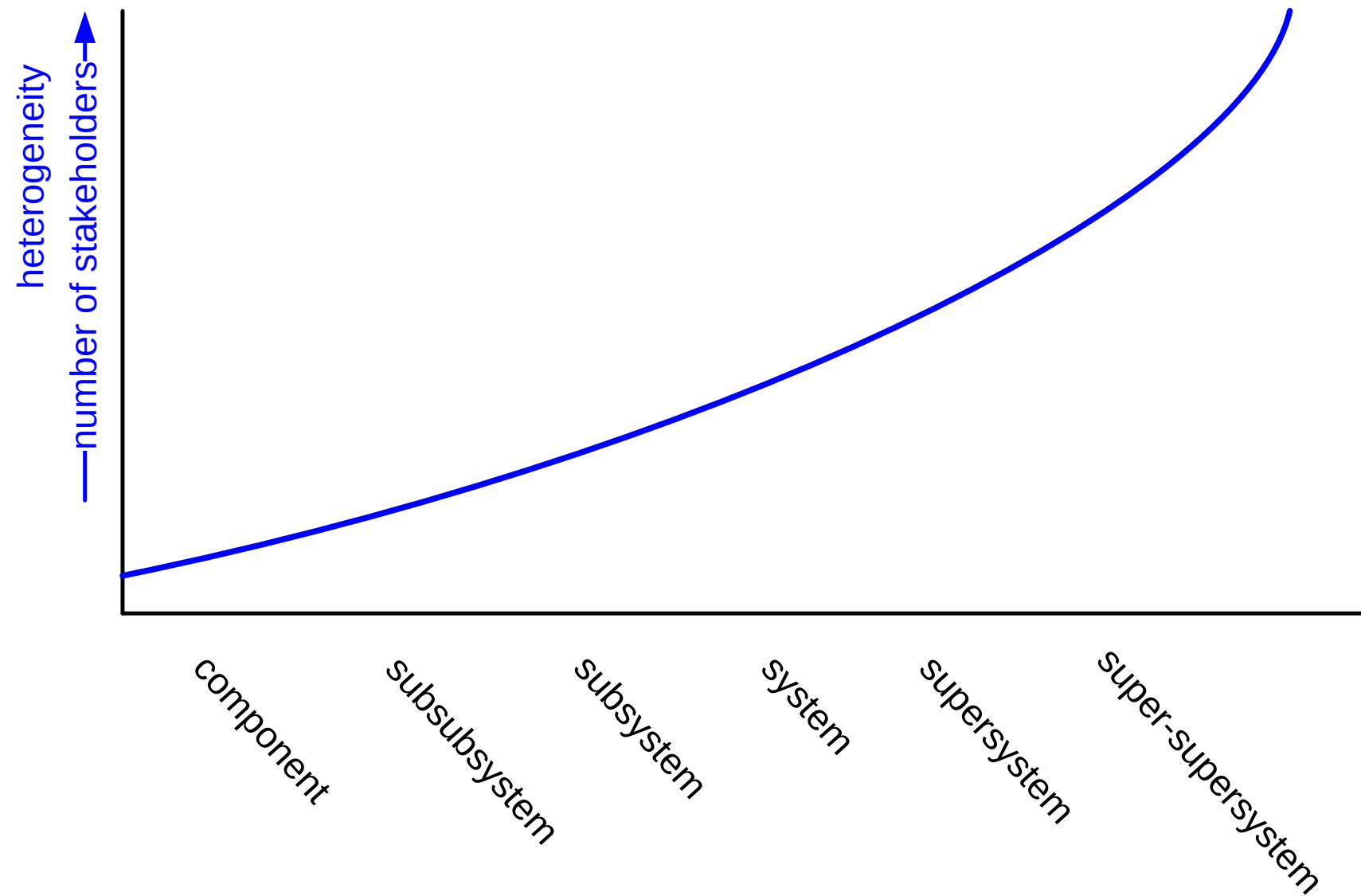
From CAFCR+ to Architecture Essence



Architecture Description

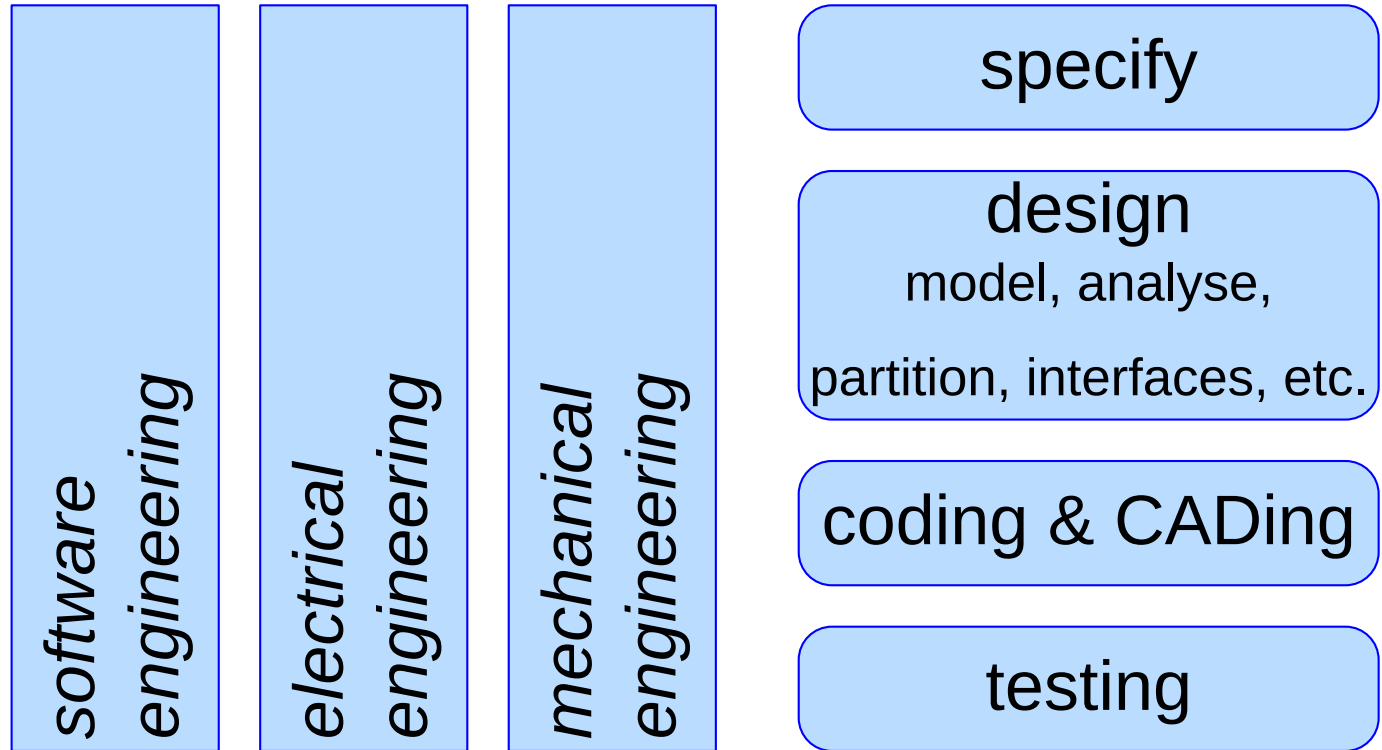


Increasing System Scope, Increasing Stakeholders

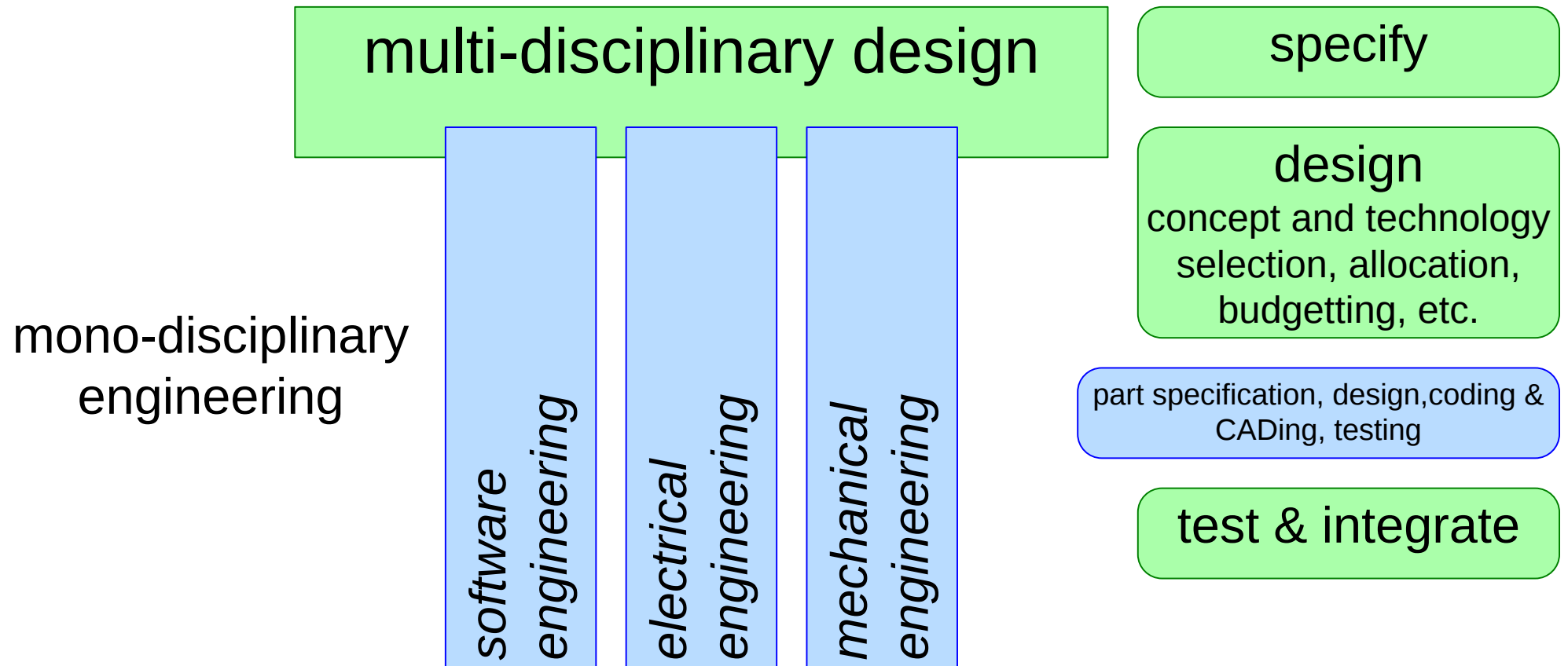


Mono-disciplinary engineering

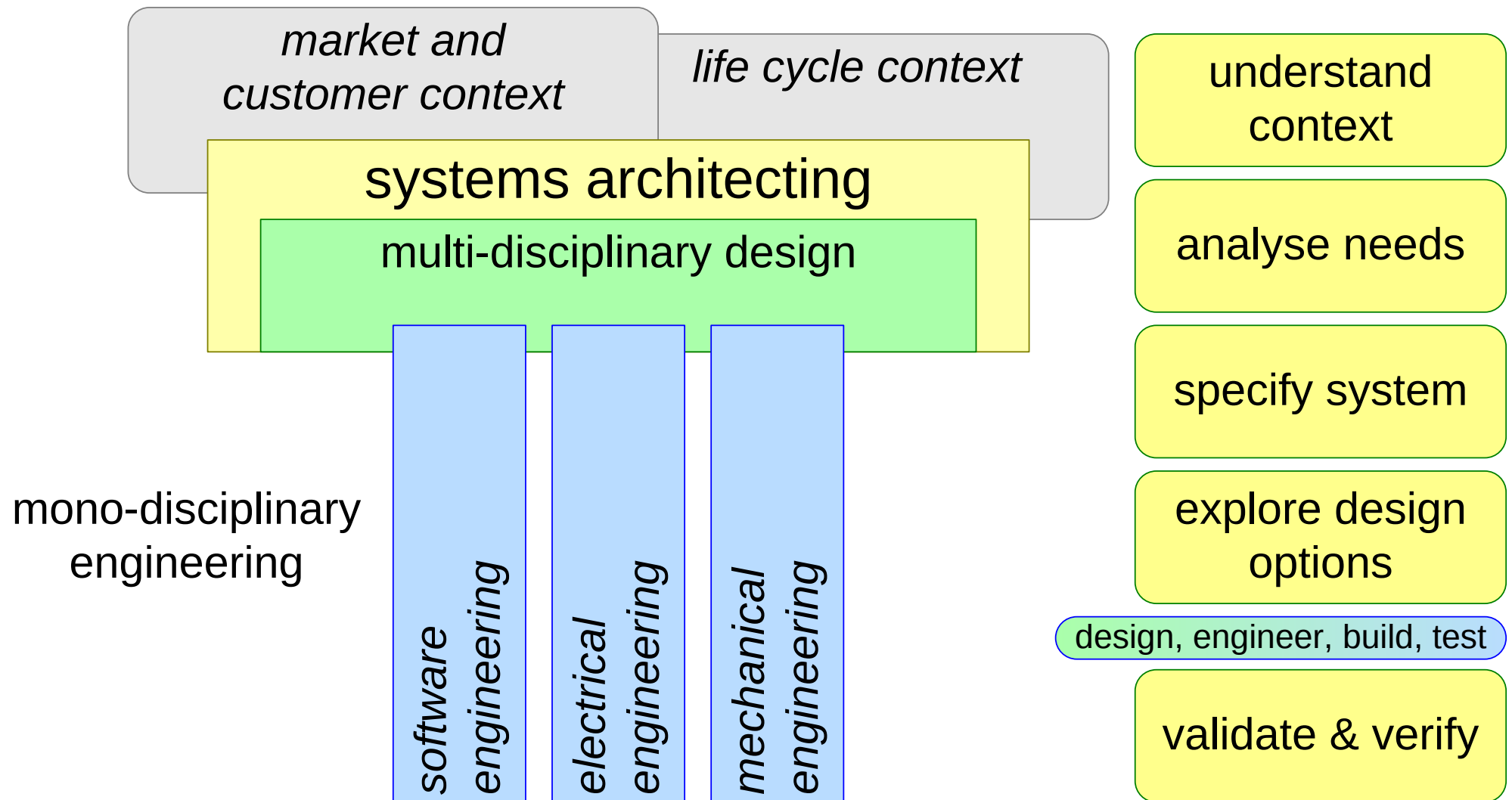
mono-disciplinary
engineering



Multi-disciplinary design and engineering



Architecting: Fit-For-Purpose



Capability Architecting

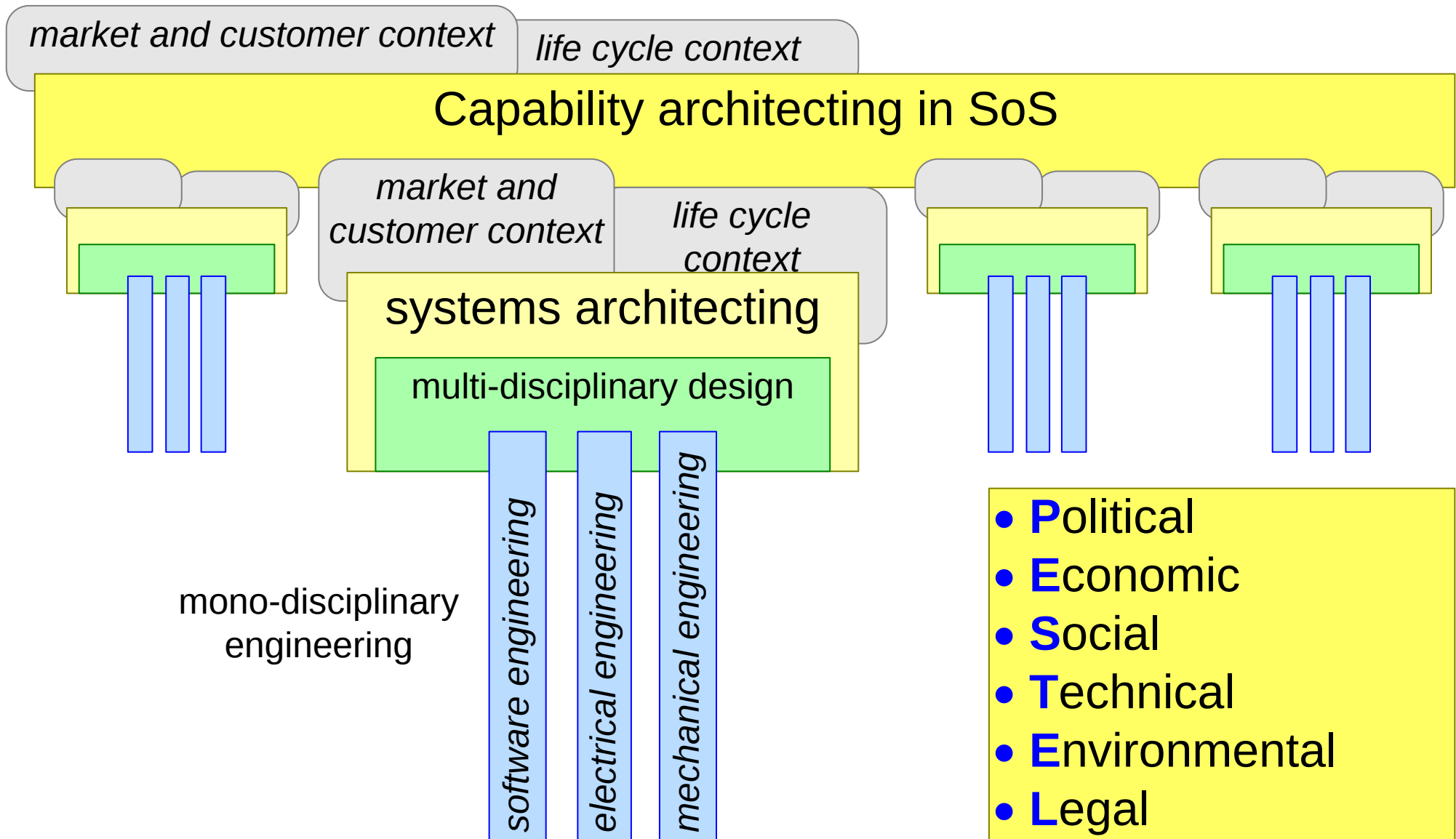
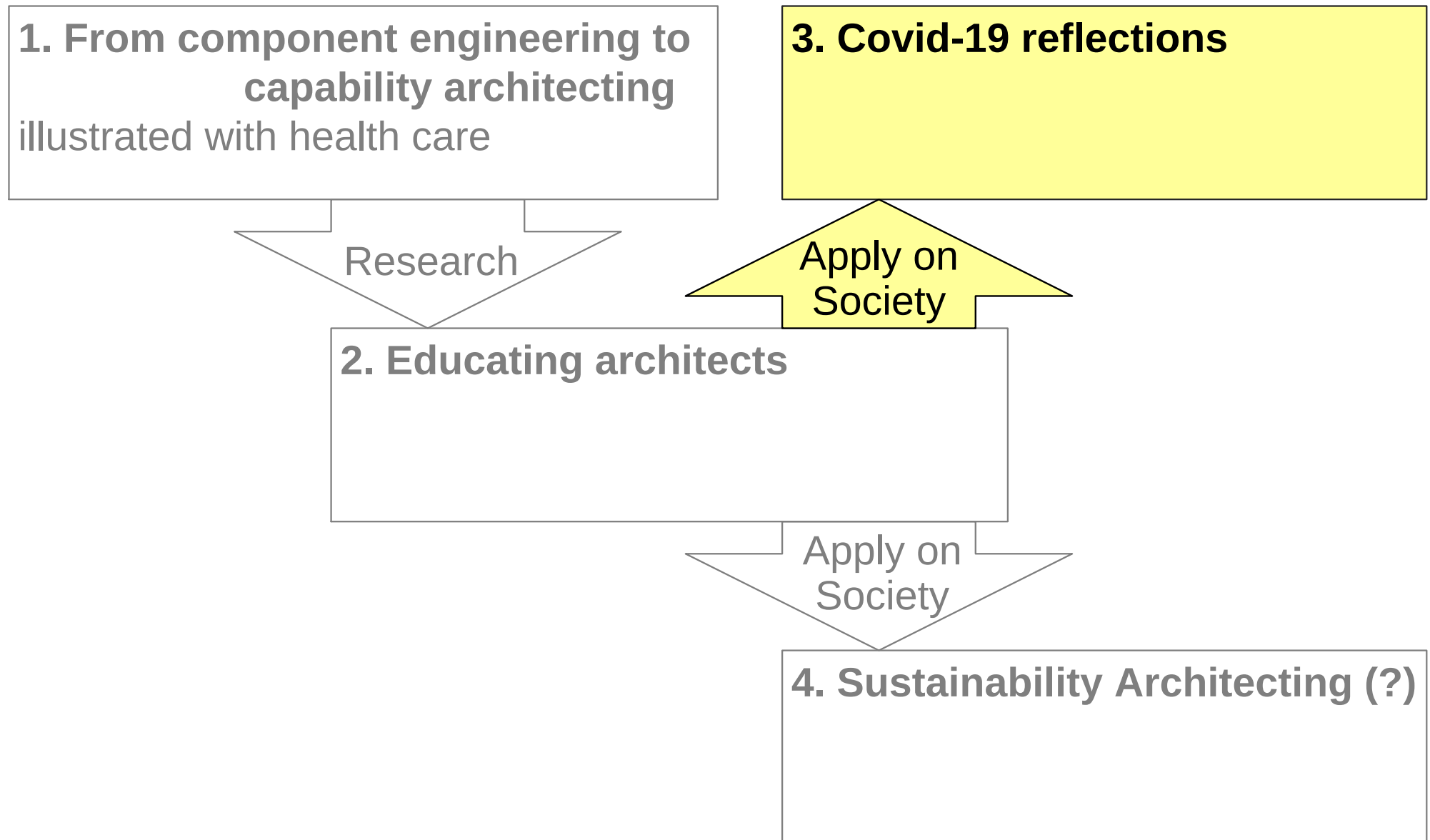


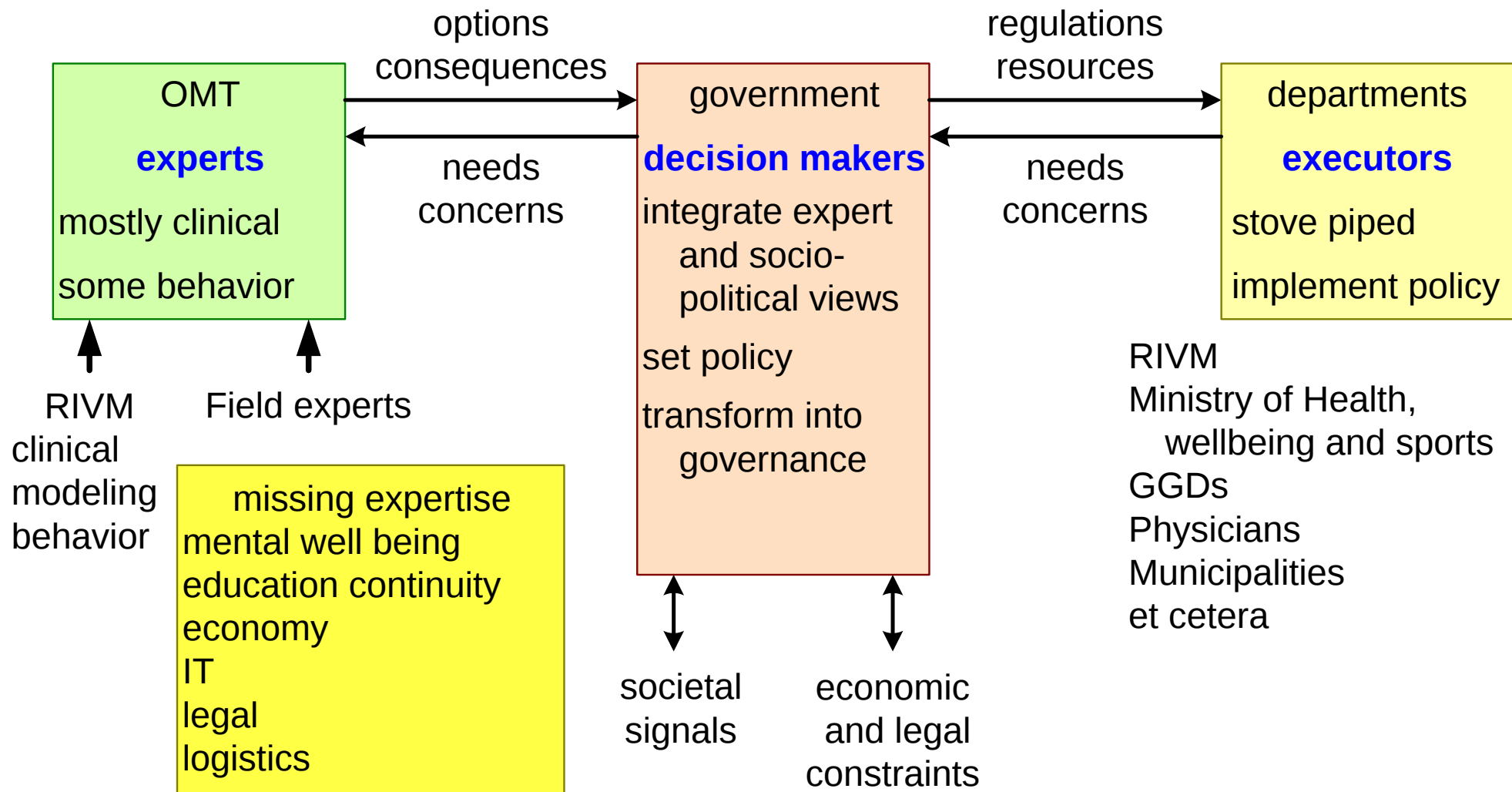
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Observing the Covid-19 Pandemic Response

- The pandemic risk was well known.
- (Western) Societies were unprepared for a pandemic.
- Many systemic problems in **crisis handling**, **problem analysis**, **solution exploration**, and **decision making** became acute
- The poor human capability to understand **exponential growth** and **latency** complicated communication and implementation of measures.
- The IT-support was **unreliable** and **dysfunctional**

Roles in the Pandemic Situation



Who does the Systems Thinking?

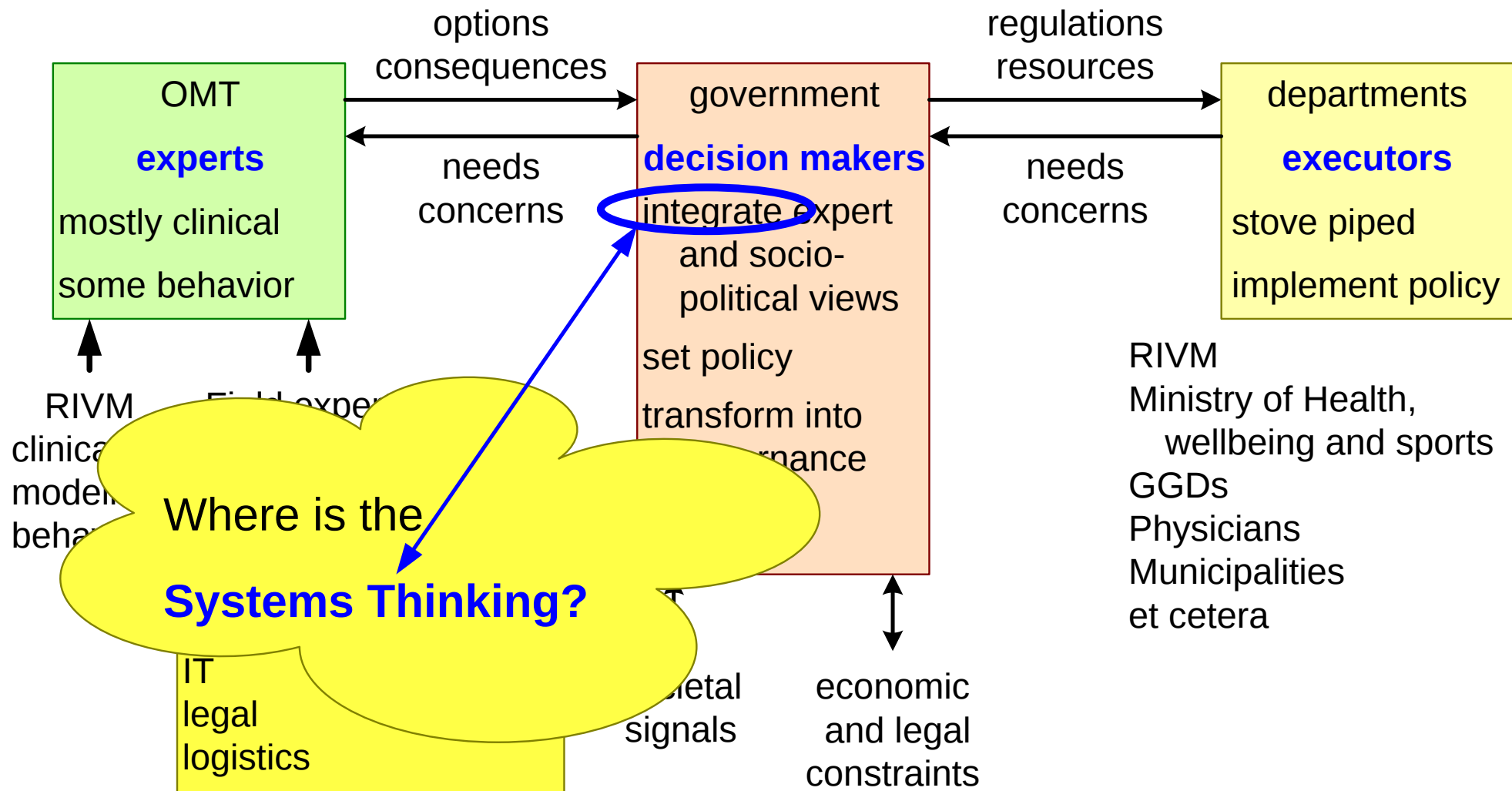
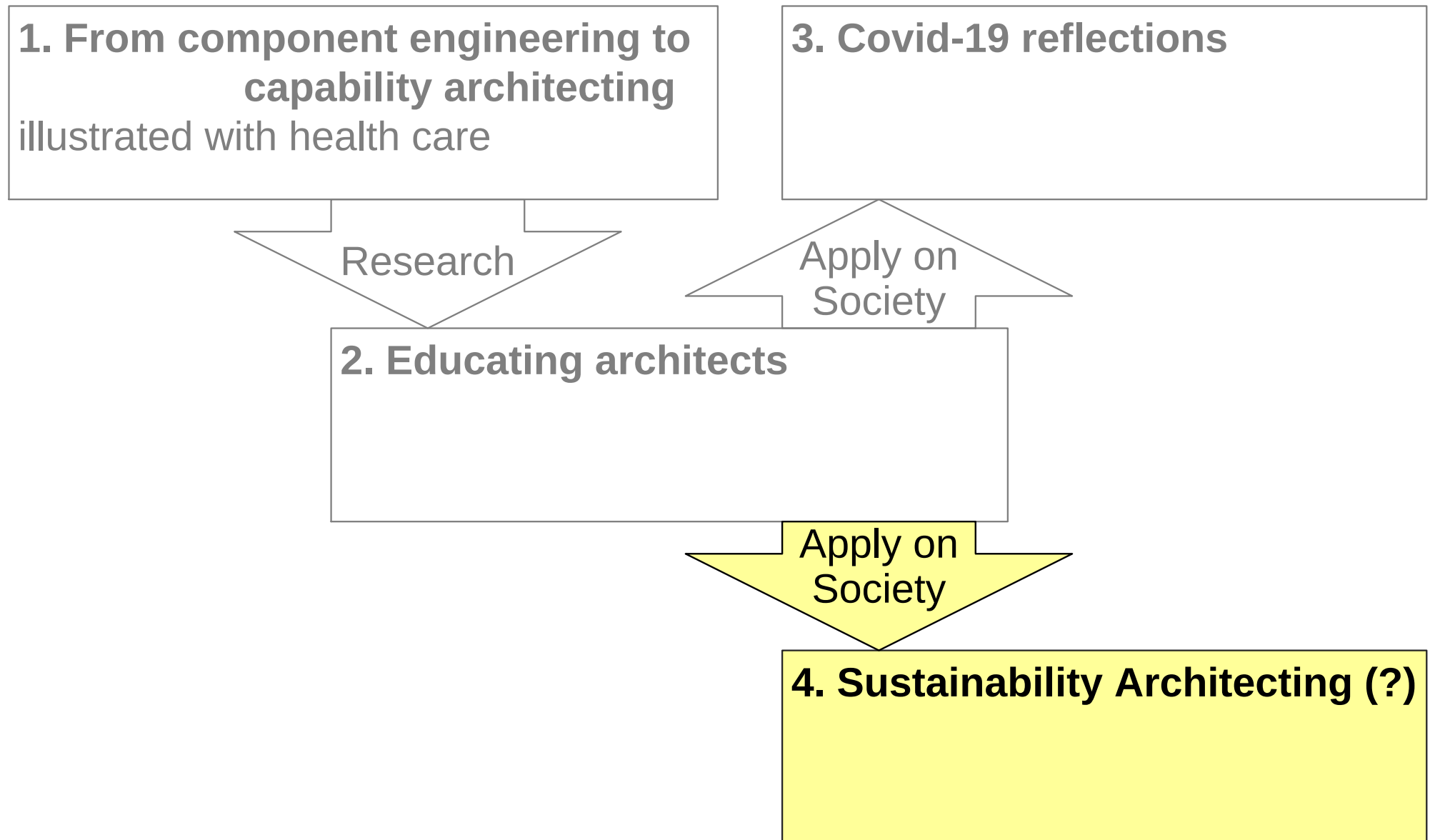
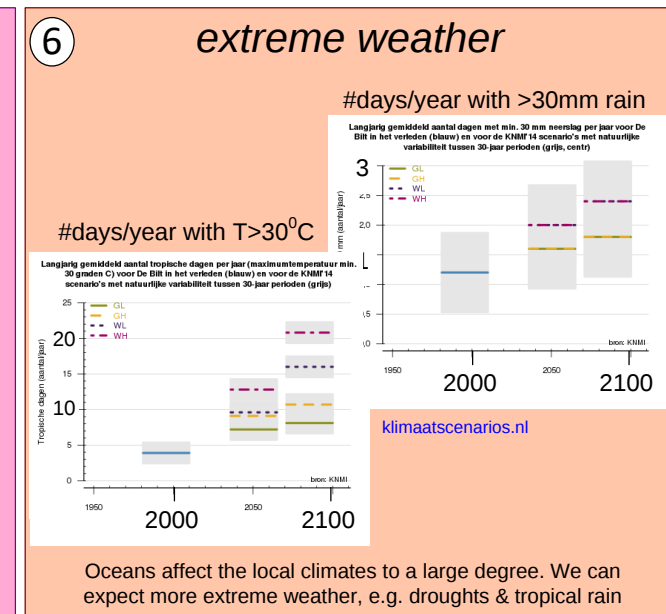
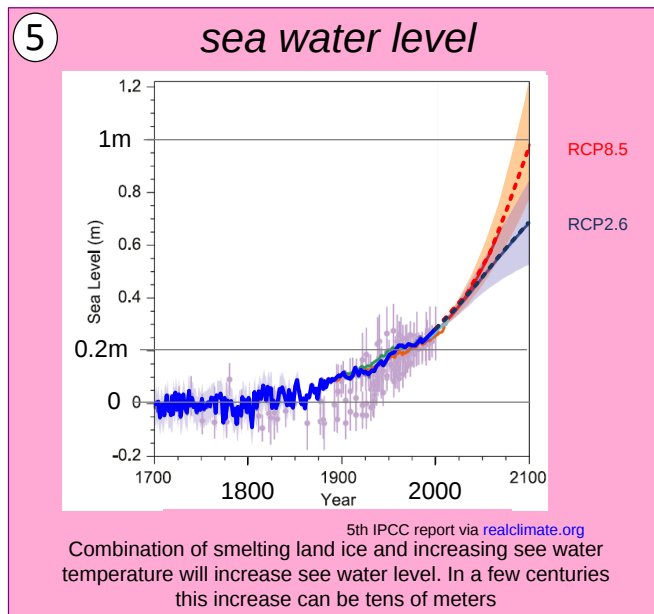
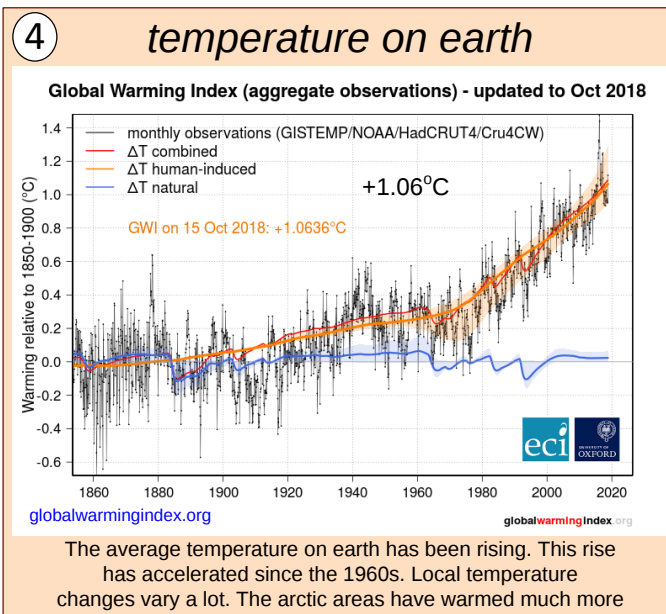
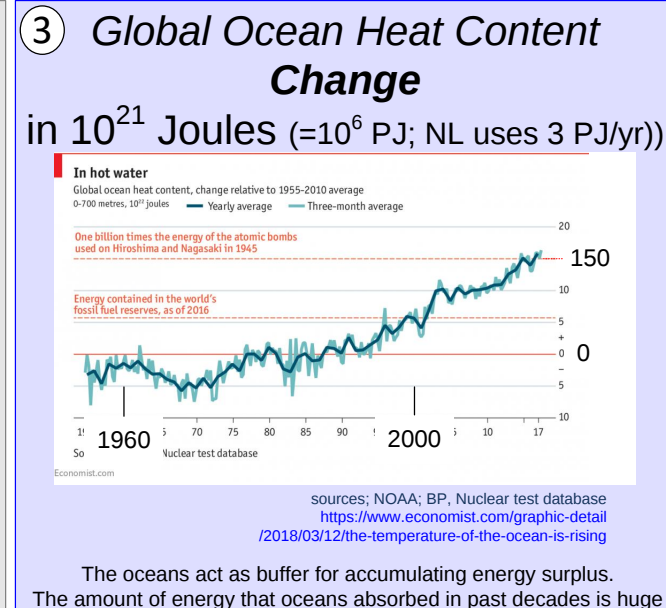
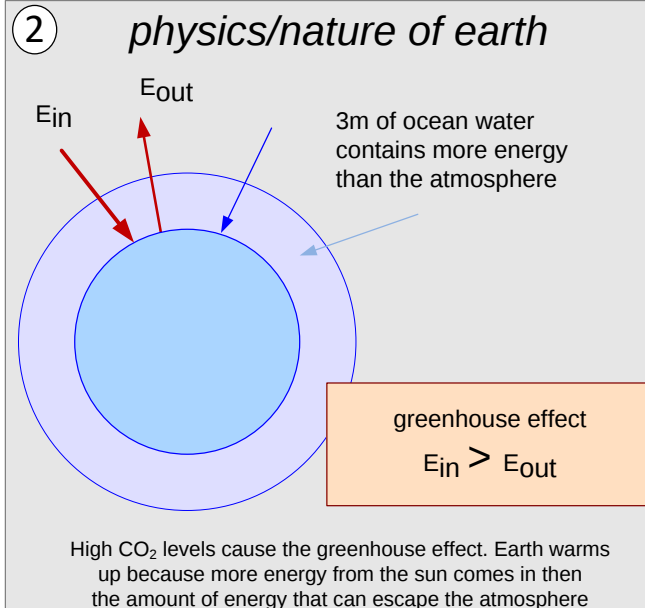
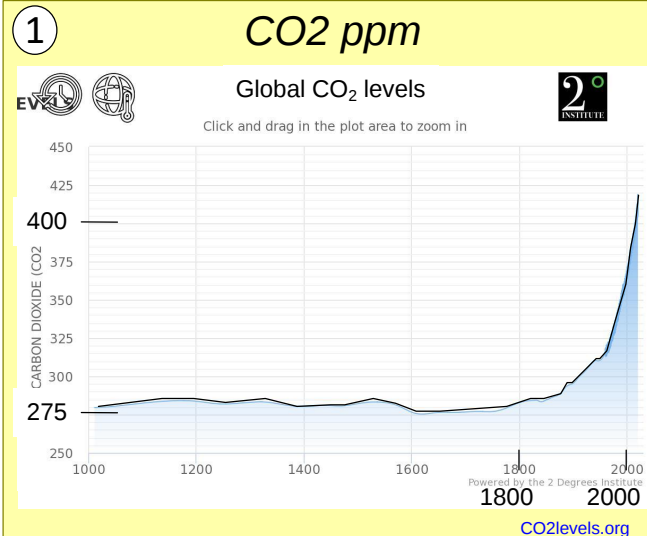


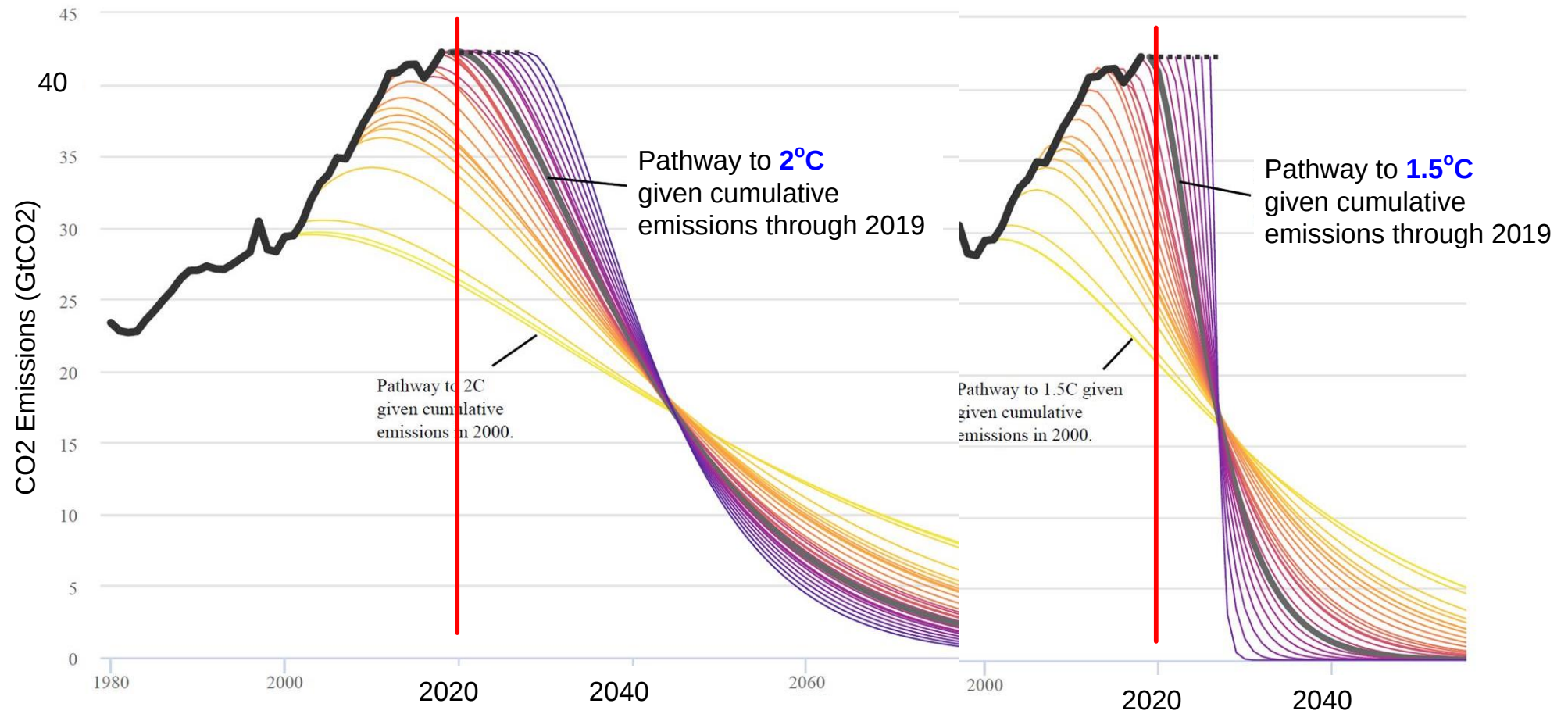
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Climate Change Simplified



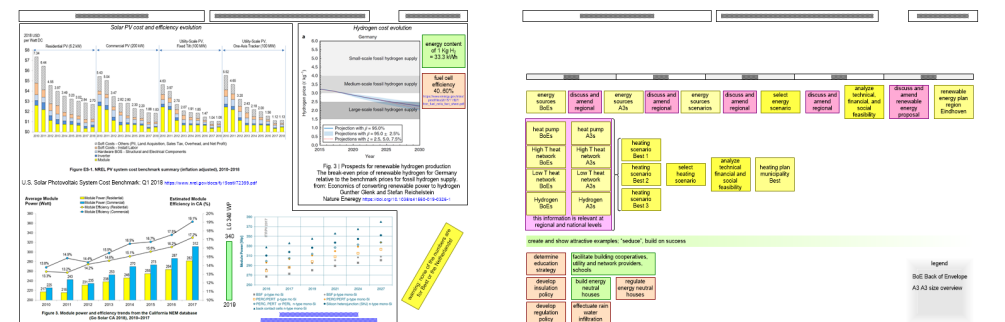
Time is Running Out



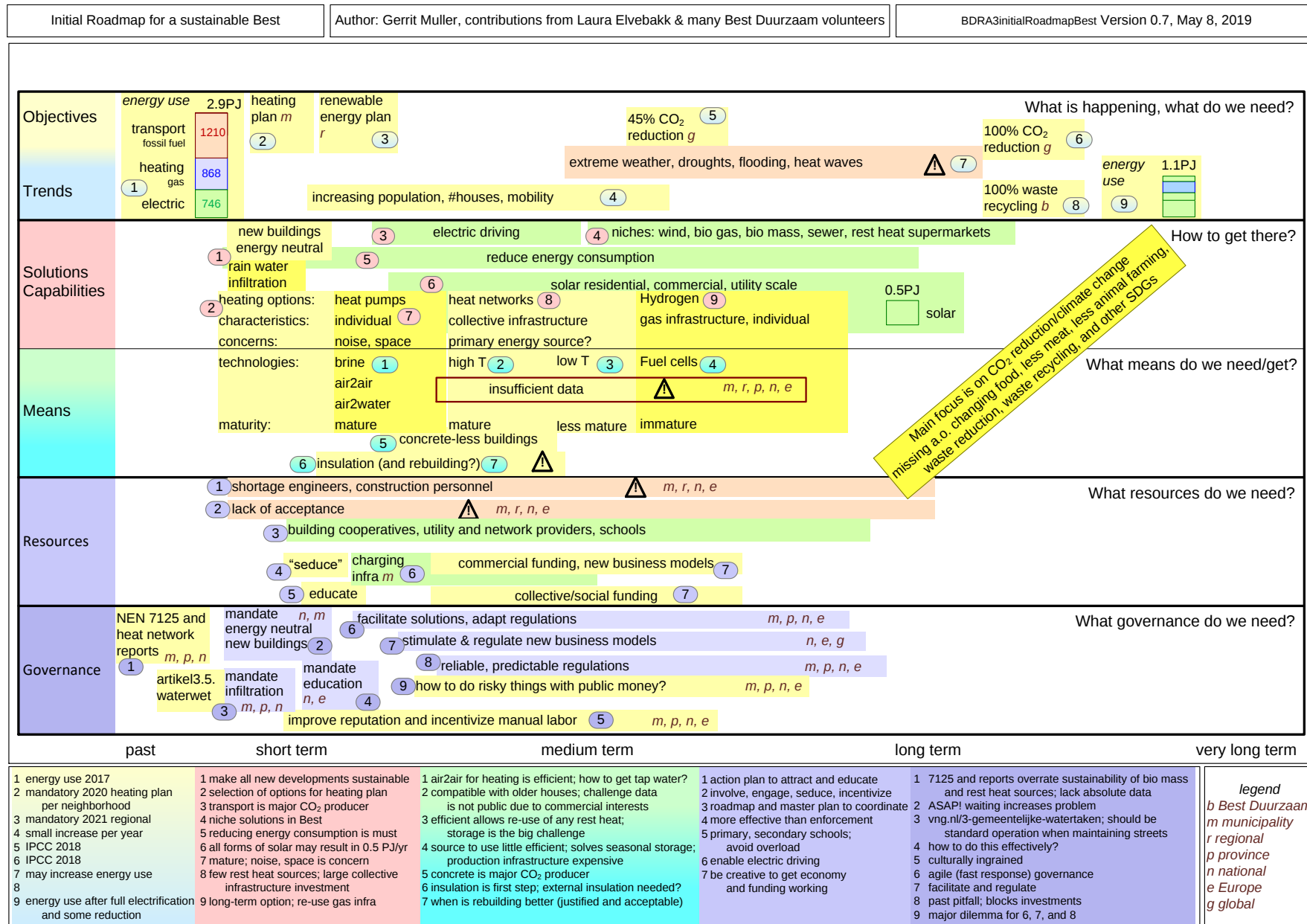
<https://www.carbonbrief.org/unep-1-5c-climate-target-slipping-out-of-reach>

Source: Historical CO2 emissions from the Global Carbon Project. 1.5C carbon budgets based on the IPCC SR15 report. Original figure from Robbie Andrews. Chart by Carbon Brief using Highcharts.

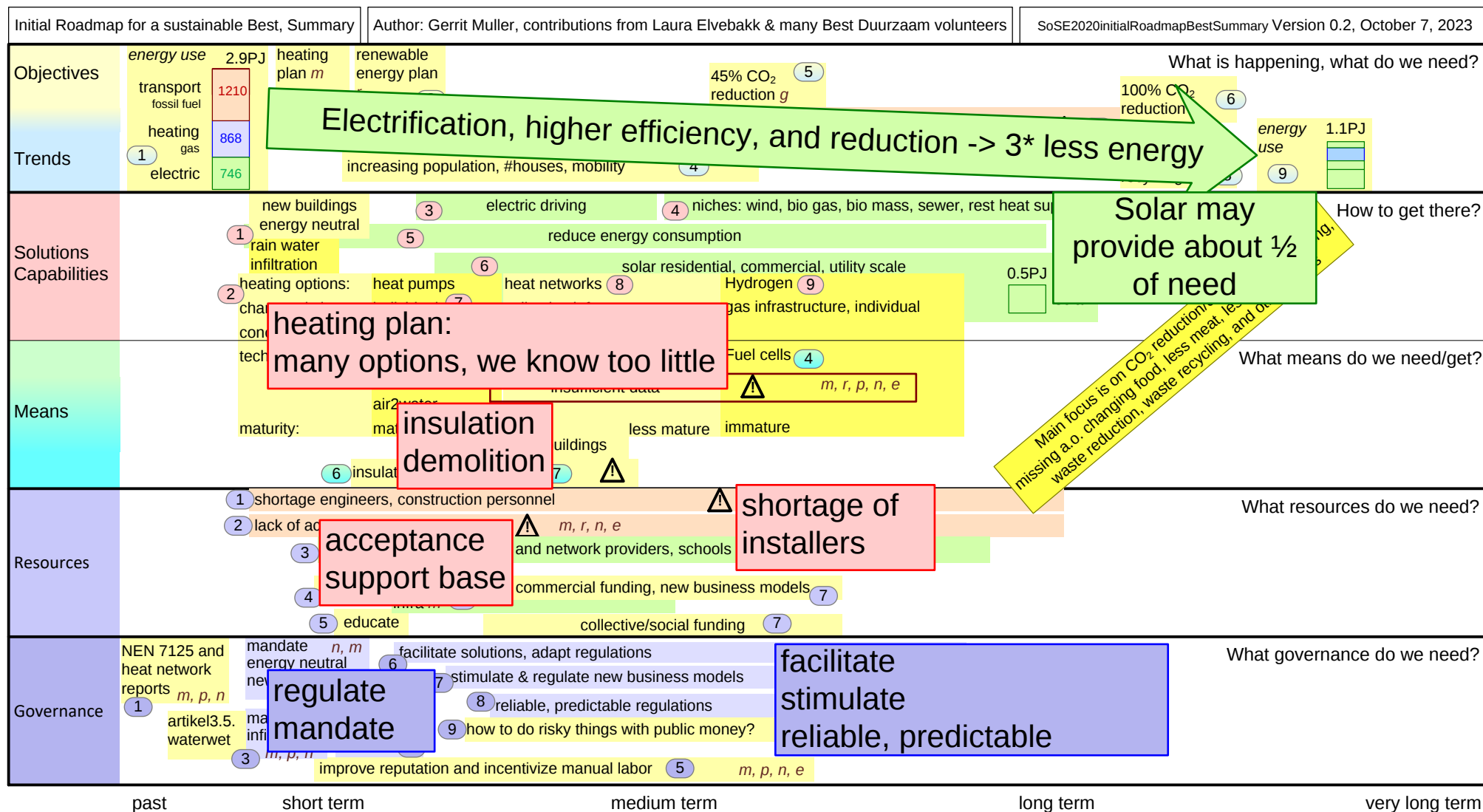
What Roles in Sociotechnical Systems?



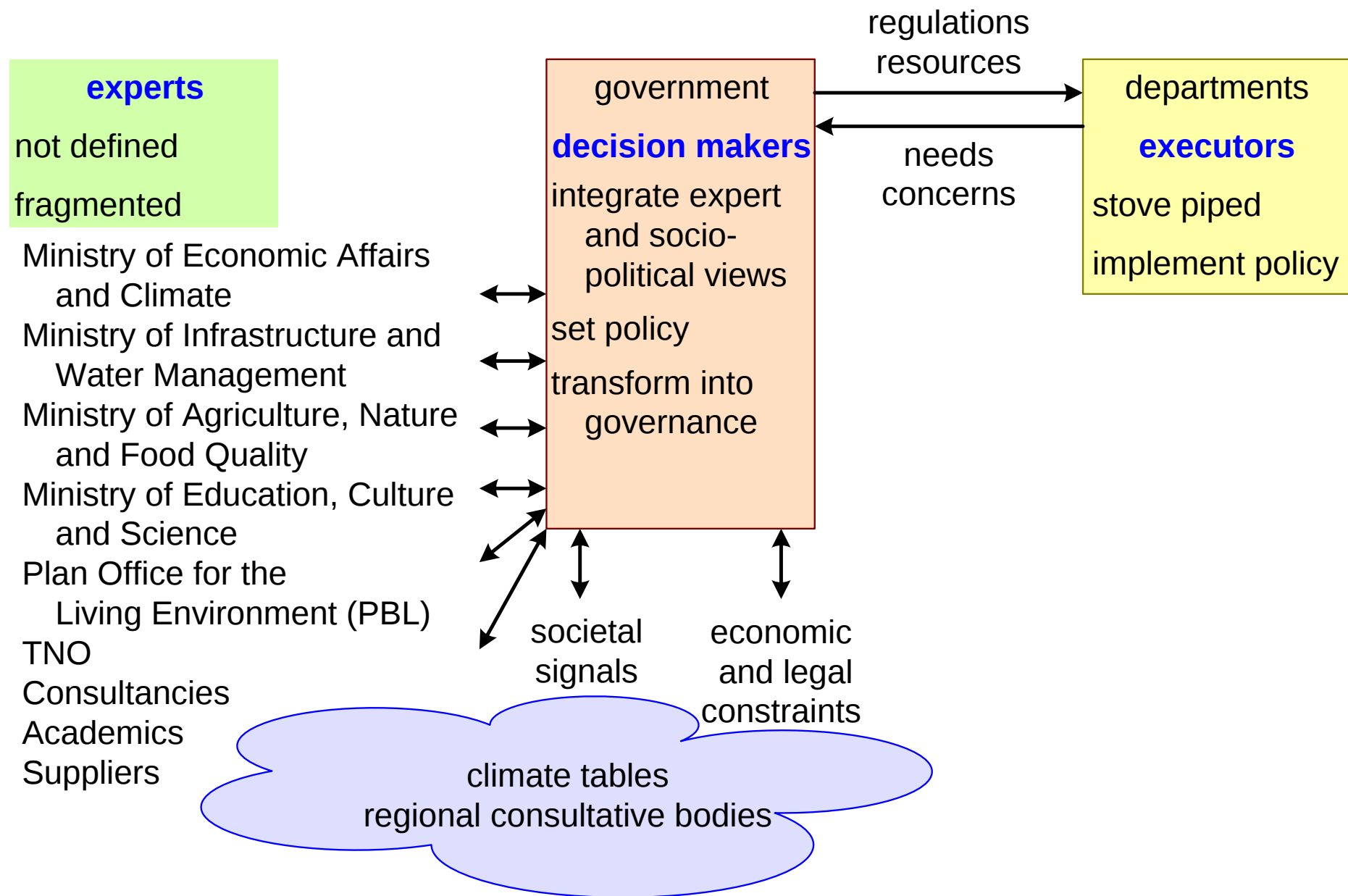
Initial Roadmap: Condensed but still Overwhelming



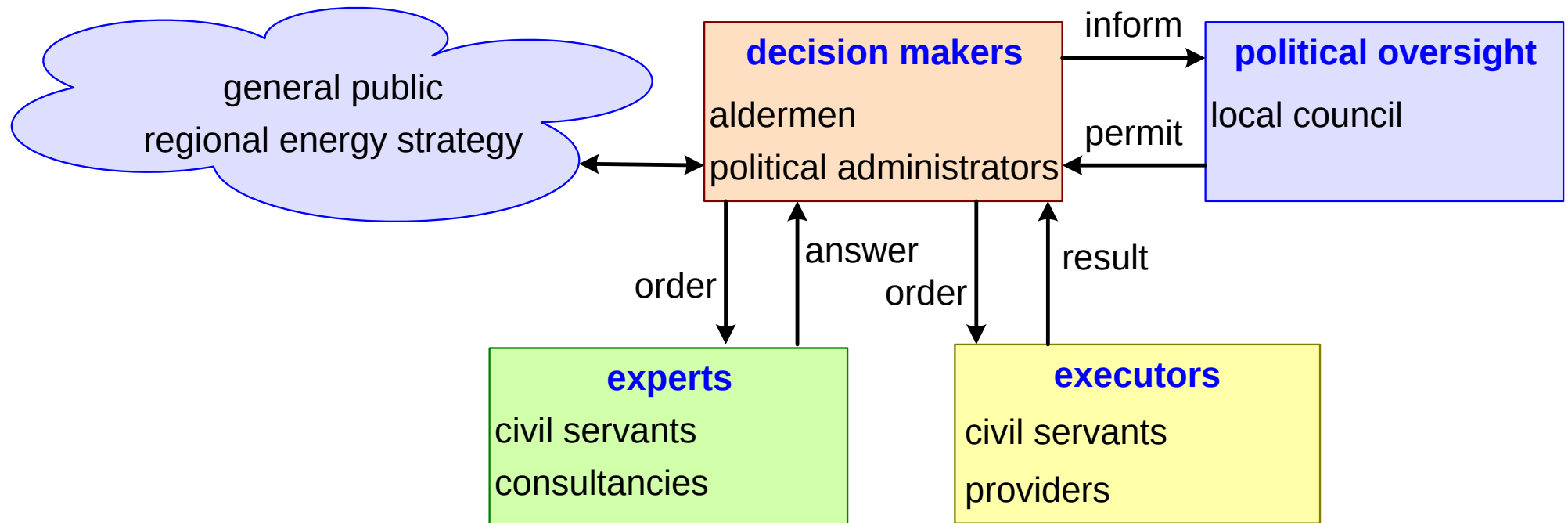
Summary Sustainability Roadmap Best



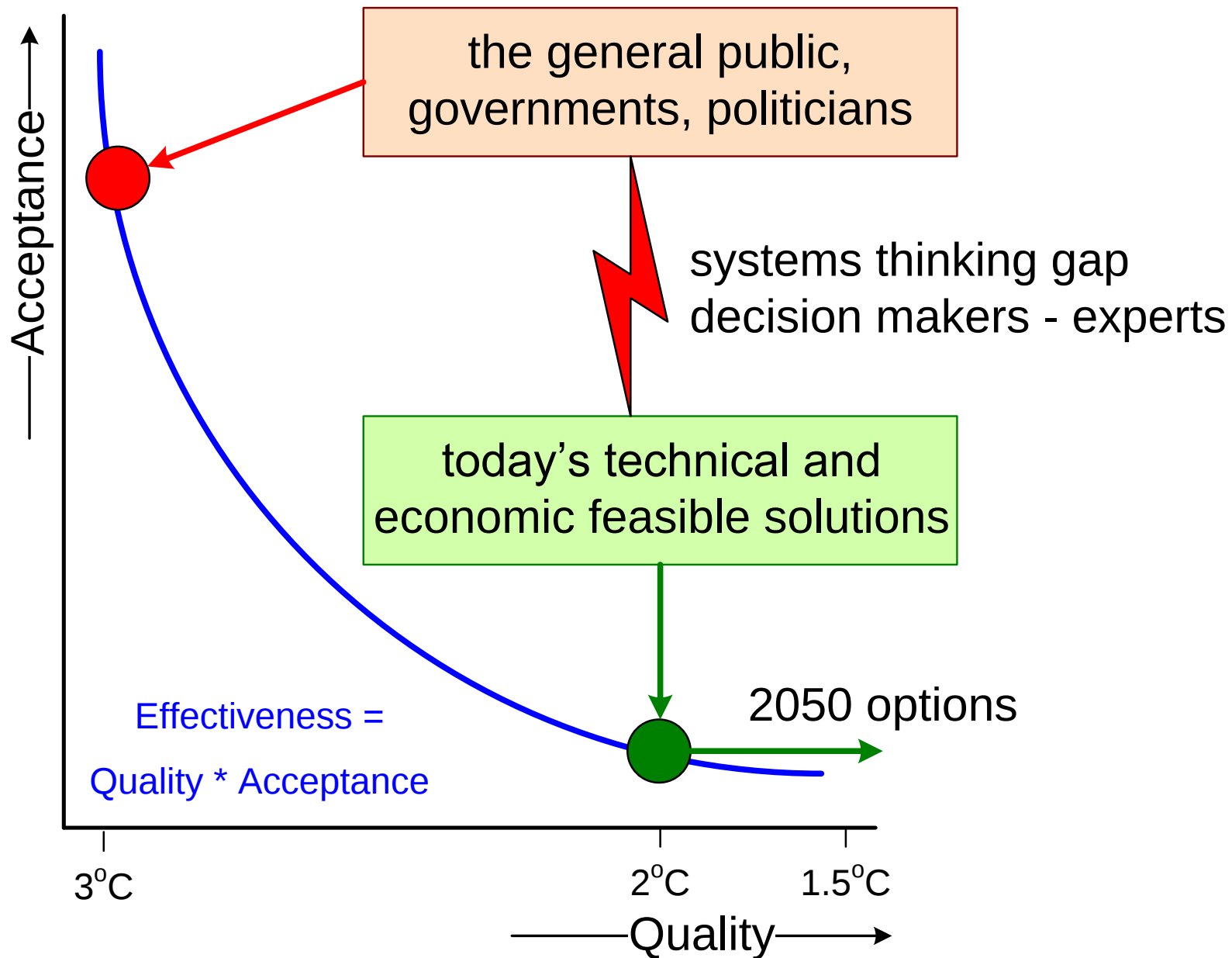
National Sustainability Organization(?)



Local Sustainability Organization(?)



Solutions are Known, the Leadership is Missing



From Past to Future

