

Capability development at the Embedded Systems Institute

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Abstract

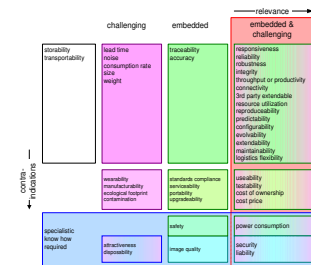
The *systems* discipline is decomposed in views and qualities and complemented with a framework to integrate again. The qualities are taken as starting point to define system design capabilities. These capabilities are analyzed and a set of embedded system capabilities is proposed.

The ESI approach with projects and capabilities is described. The contribution of ESI is explained. Some background is provided about the technology management and research method aspects.

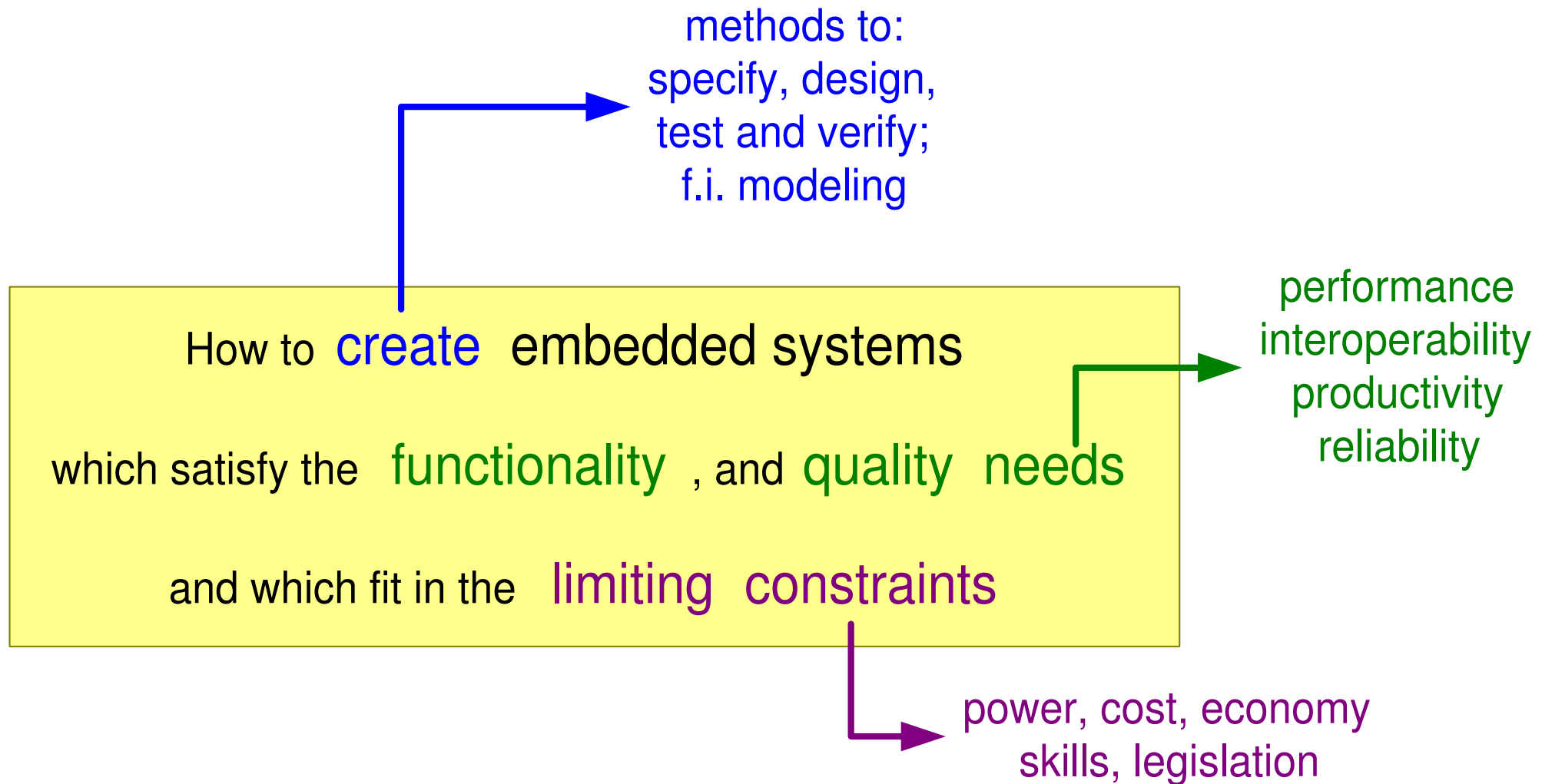
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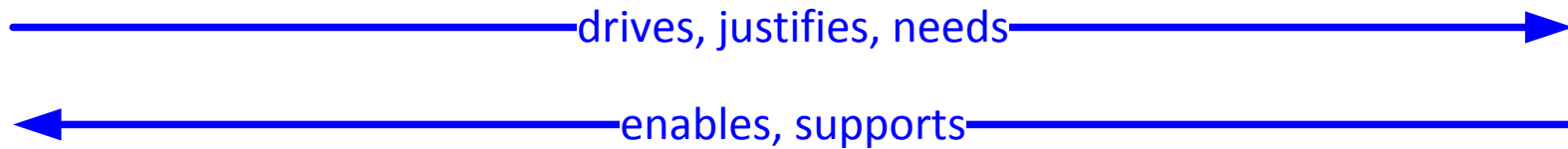
June 23, 2016
status: draft
version: 1.0



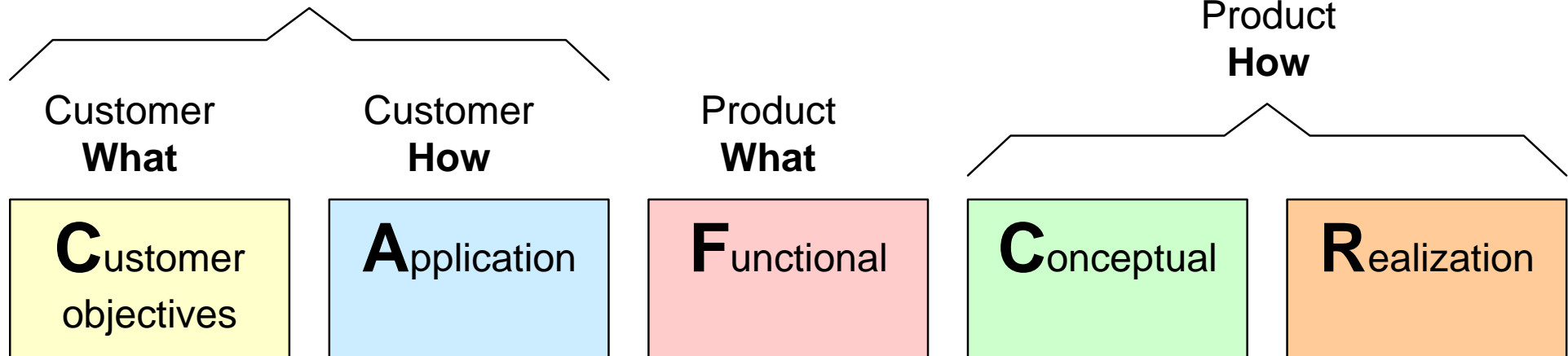
Role of Embedded Systems Institute ESI



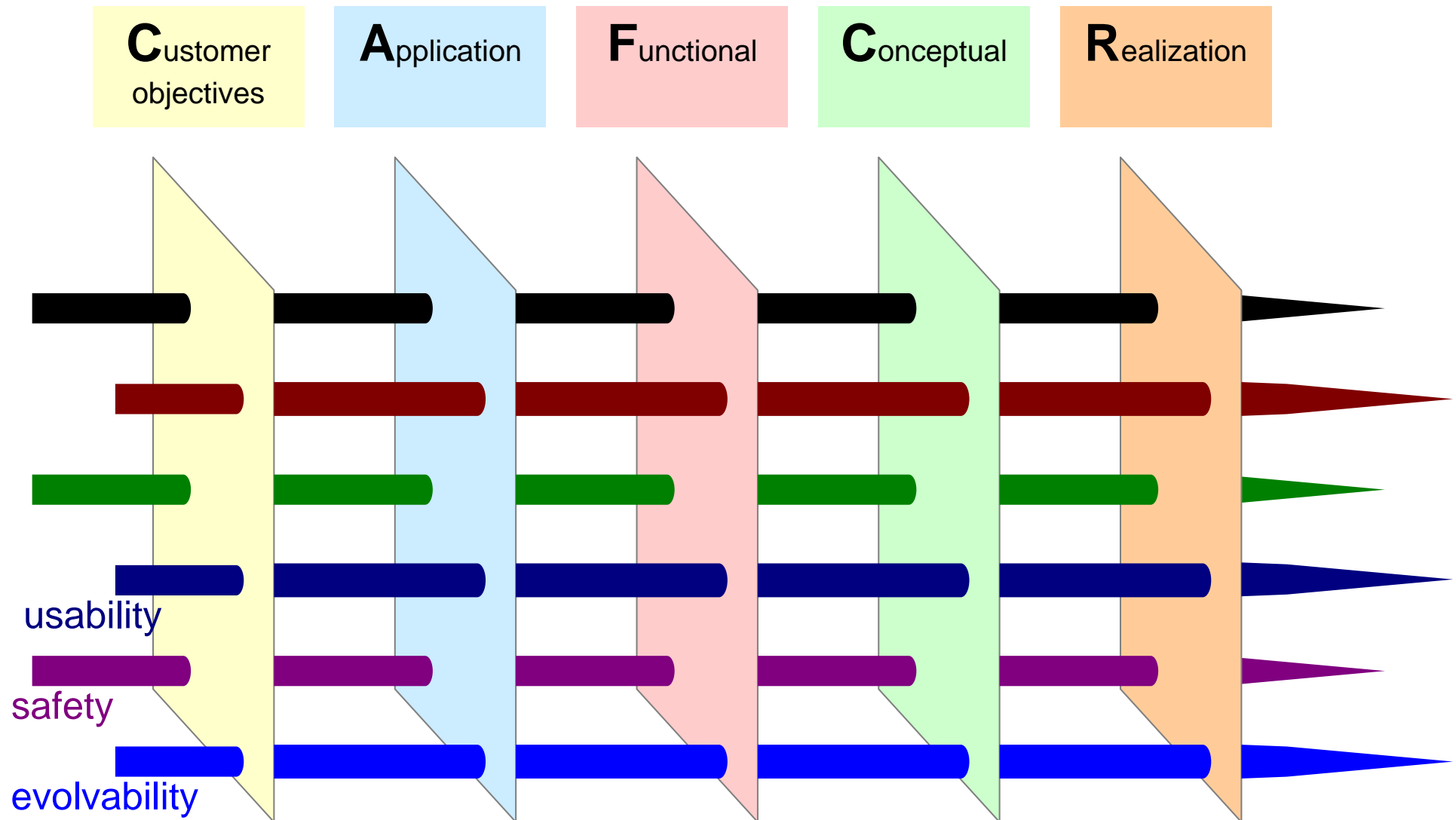
The "CAFCR" model



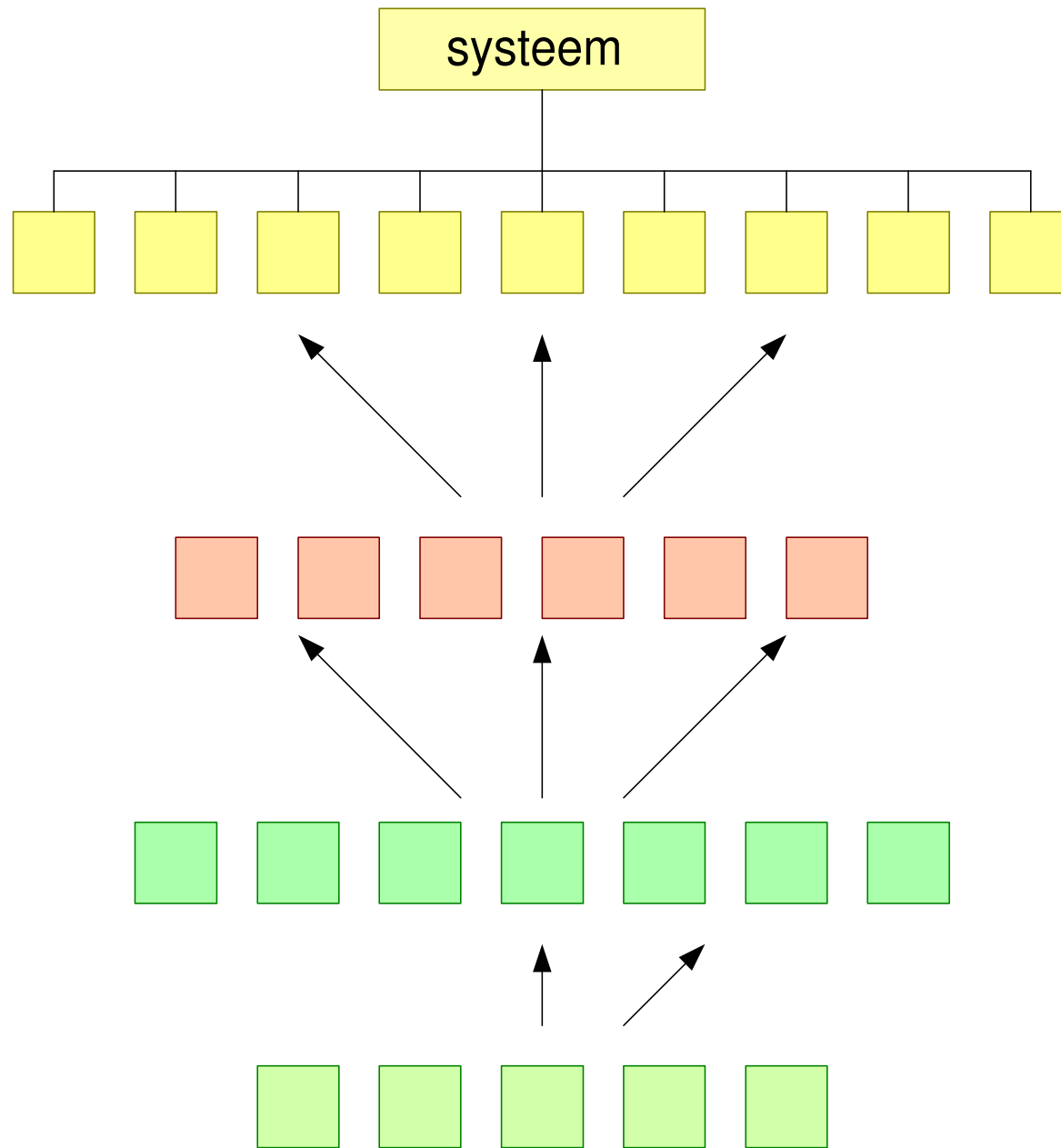
What does Customer need
in Product and **Why?**



Qualities as basis for capabilities



Multi Disciplinary Builds on Mono Disciplinary



system



has attributes

qualities



*designed by
emerging from*

multi disciplinary
design methods



builds on top of

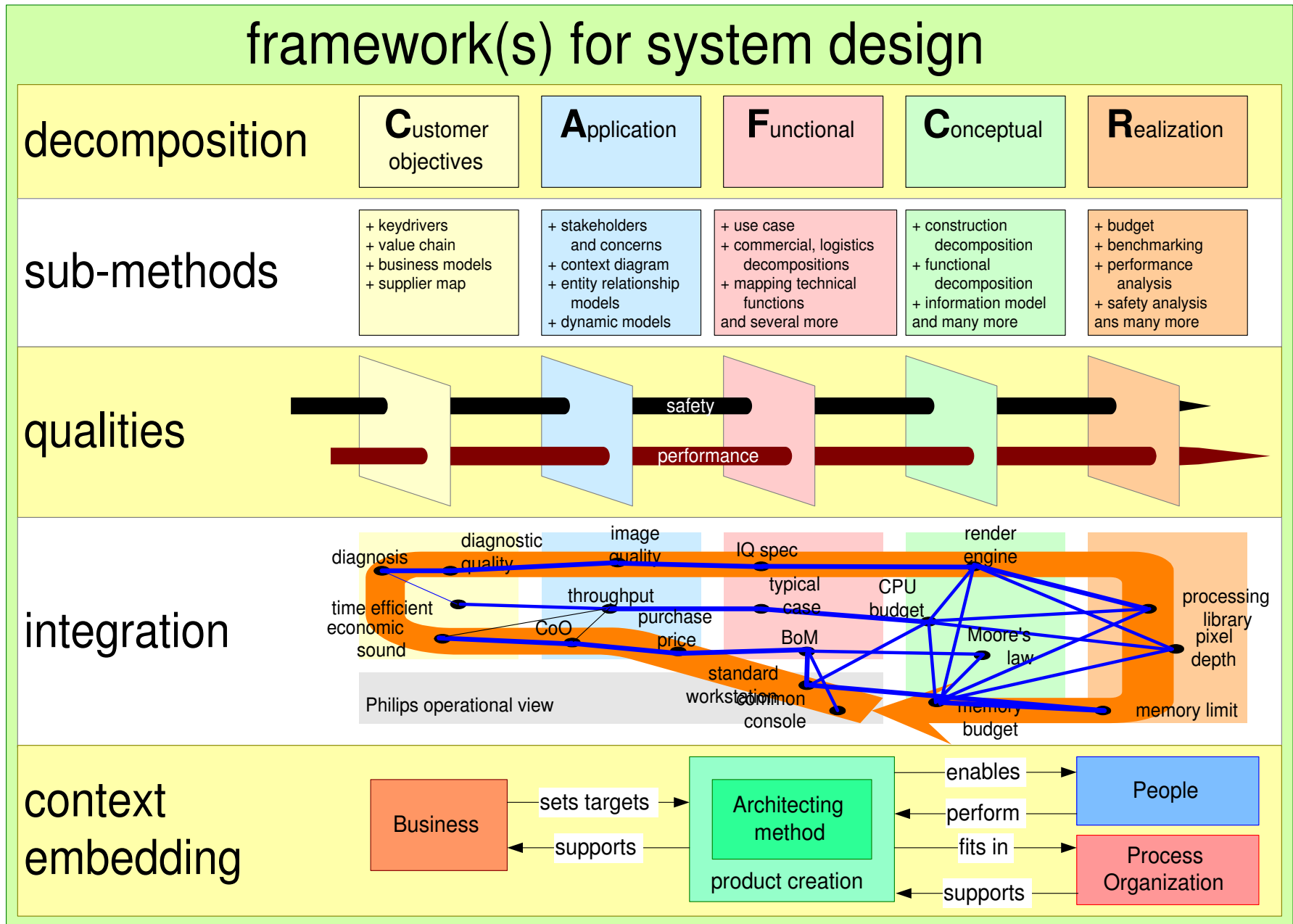
mono disciplinary
design methods



unlocks potential of

technologies

Overview of methods in relation with context



Checklist of system qualities

usable

usability
attractiveness
responsiveness
image quality
wearability
storability
transportability

dependable

safety
security
reliability
robustness
integrity
availability

effective

throughput or
productivity

interoperable

connectivity
3rd party extendible

liable

liability
testability
traceability
standards compliance

efficient

resource utilization
cost of ownership

consistent

reproducibility
predictability

serviceable

serviceability
configurability
installability

future proof

evolvability
portability
upgradeability
extendibility
maintainability

logistics friendly

manufacturability
logistics flexibility
lead time

ecological

ecological footprint
contamination
noise
disposability

down to earth attributes

cost price
power consumption
consumption rate
(water, air,
chemicals,
et cetera)
size, weight
accuracy

Domain specific aspects

usable

- useability
- attractiveness
- responsiveness
- image quality
- wearability
- storability
- transportability

reliable

- safety
- security
- reliability
- robustness
- integrity

effective

- throughput or productivity

interoperable

- connectivity
- 3rd party extendable

liable

- liability
- testability
- traceability
- standards compliance

efficient

- resource utilization
- cost of ownership

consistent

- reproduceability
- predictability

serviceable

- serviceability
- configurability
- installability

future proof

- evolvability
- portability
- upgradeability
- extendability
- maintainability

logistics friendly

- manufacturability
- logistics flexibility
- lead time

ecological

- ecological footprint
- contamination
- noise
- disposability

down to earth attributes

- cost price
- power consumption
- consumption rate
(water, air, chemicals, etcetera)
- size, weight
- accuracy

Preferred profile for ESI capabilities

domain specific

embedded
(software intensive, electronics)

process, organisation, soft skills

specialistic

challenging

preferred profile:



-1



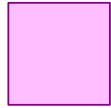
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-1



-3



2

Ranking of all criteria

usable

useability
attractiveness
responsiveness
image quality
wearability
storability
transportability

reliable

safety
security
reliability
robustness
integrity

effective

throughput or
productivity

interoperable

connectivity
3rd party extendable

liable

liability
testability
traceability
standards compliance

efficient

resource utilization
cost of ownership

consistent

reproduceability
predictability

serviceable

serviceability
configurability
installability

future proof

evolvability
portability
upgradeability
extendability
maintainability

logistics friendly

manufacturability
logistics flexibility
lead time

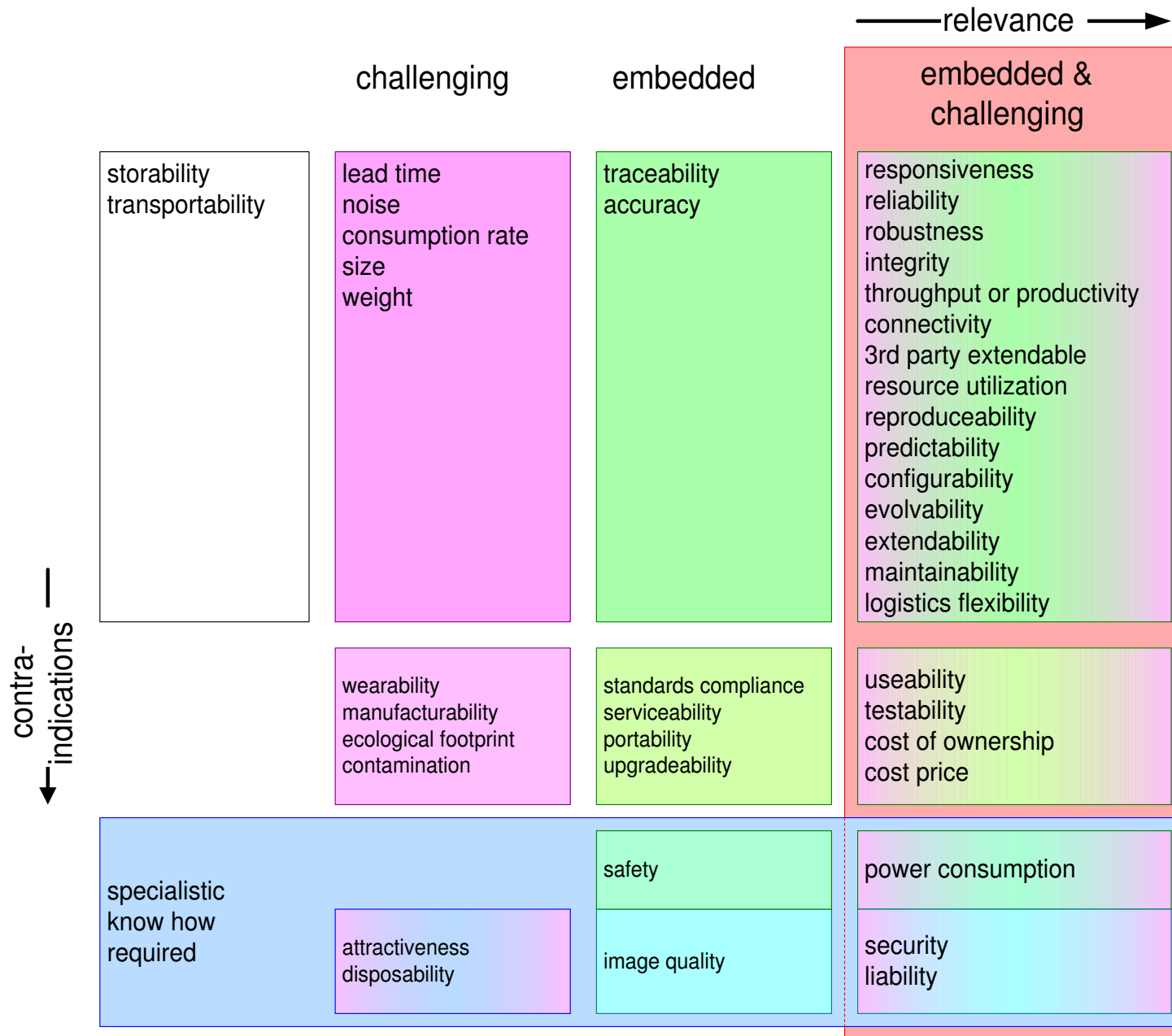
ecological

ecological footprint
contamination
noise
disposability

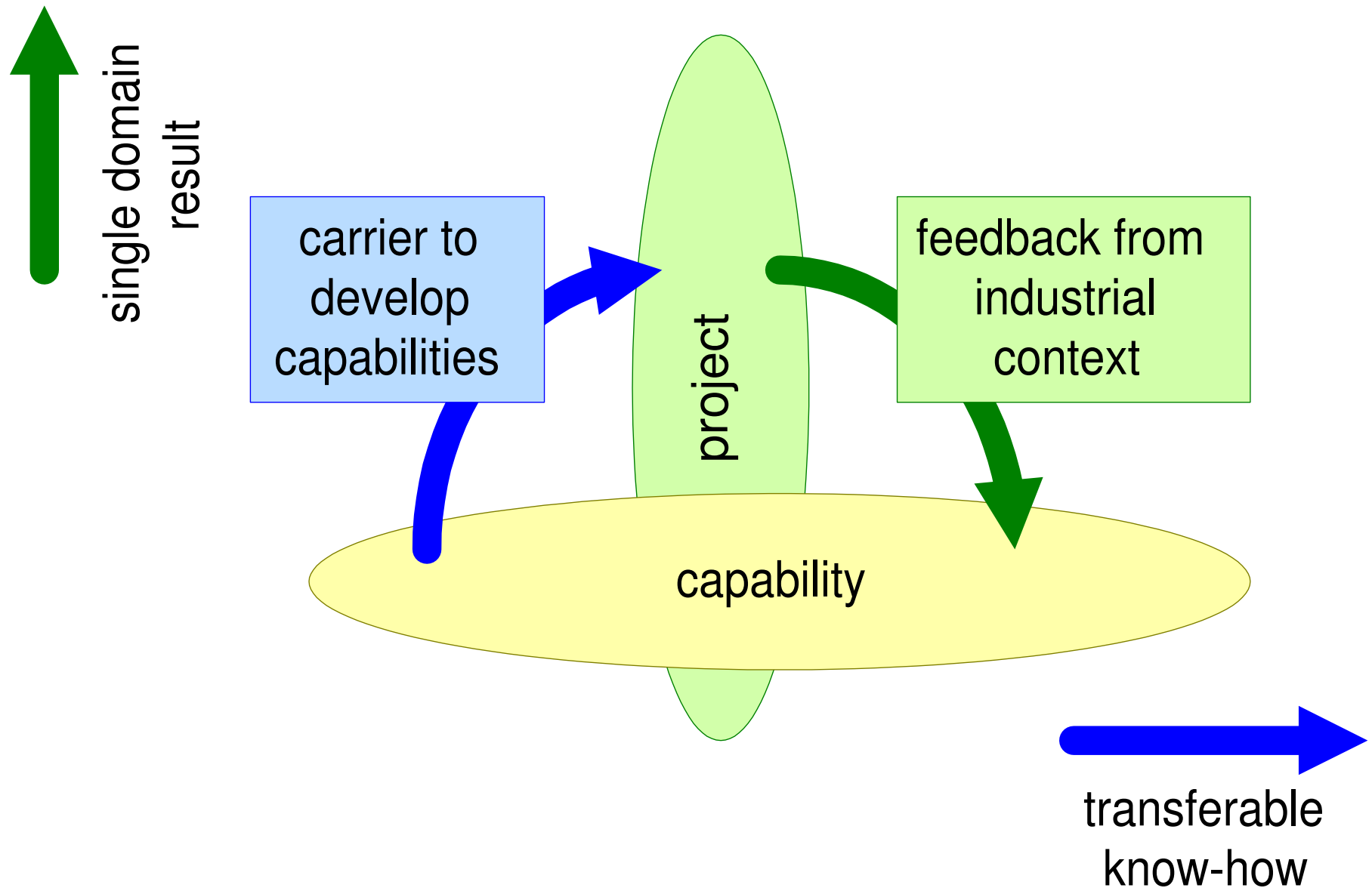
down to earth attributes

cost price
power consumption
consumption rate
(water, air,
chemicals,
etcetera)
size, weight
accuracy

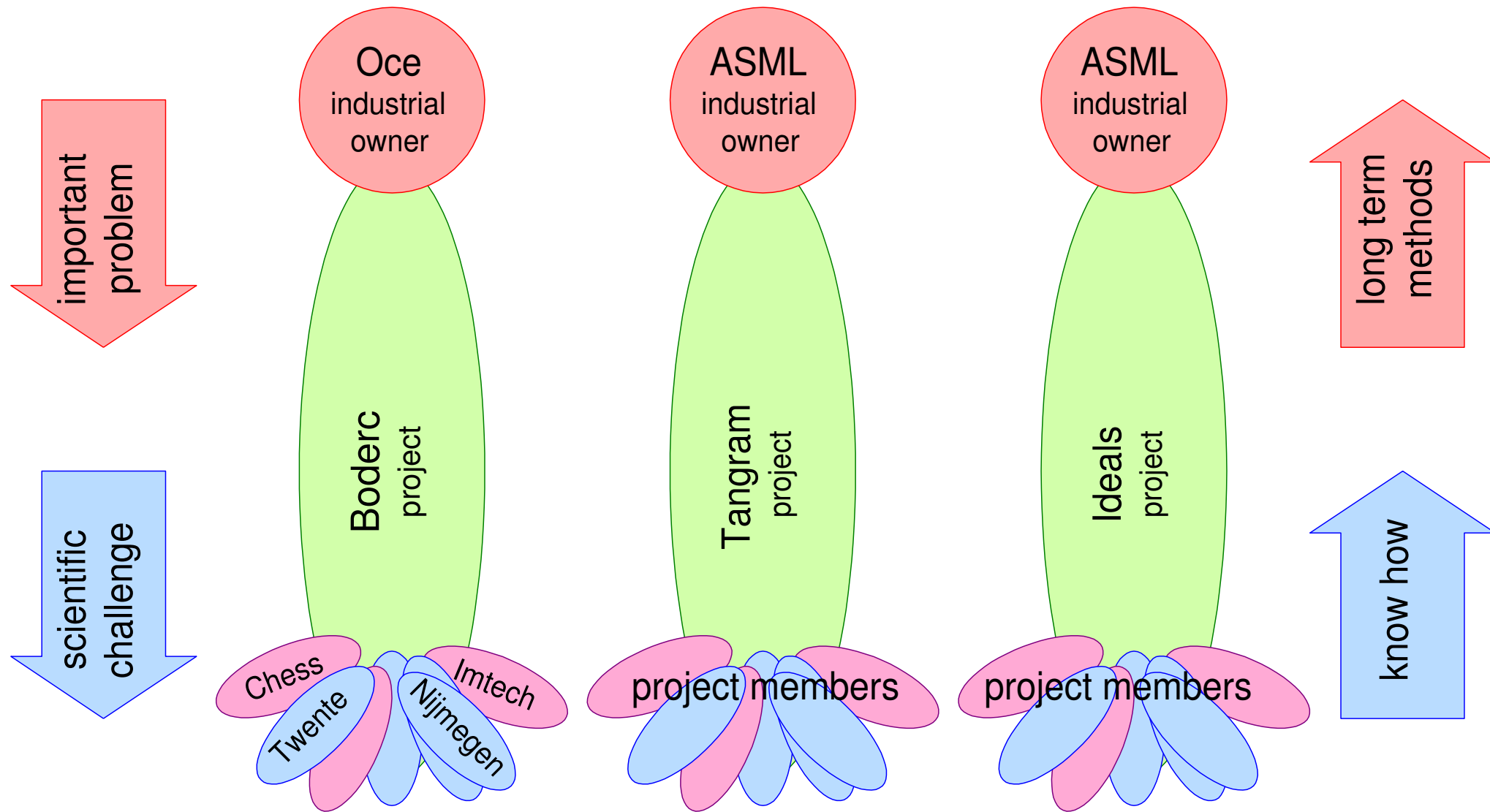
Relevance for ESI quality map



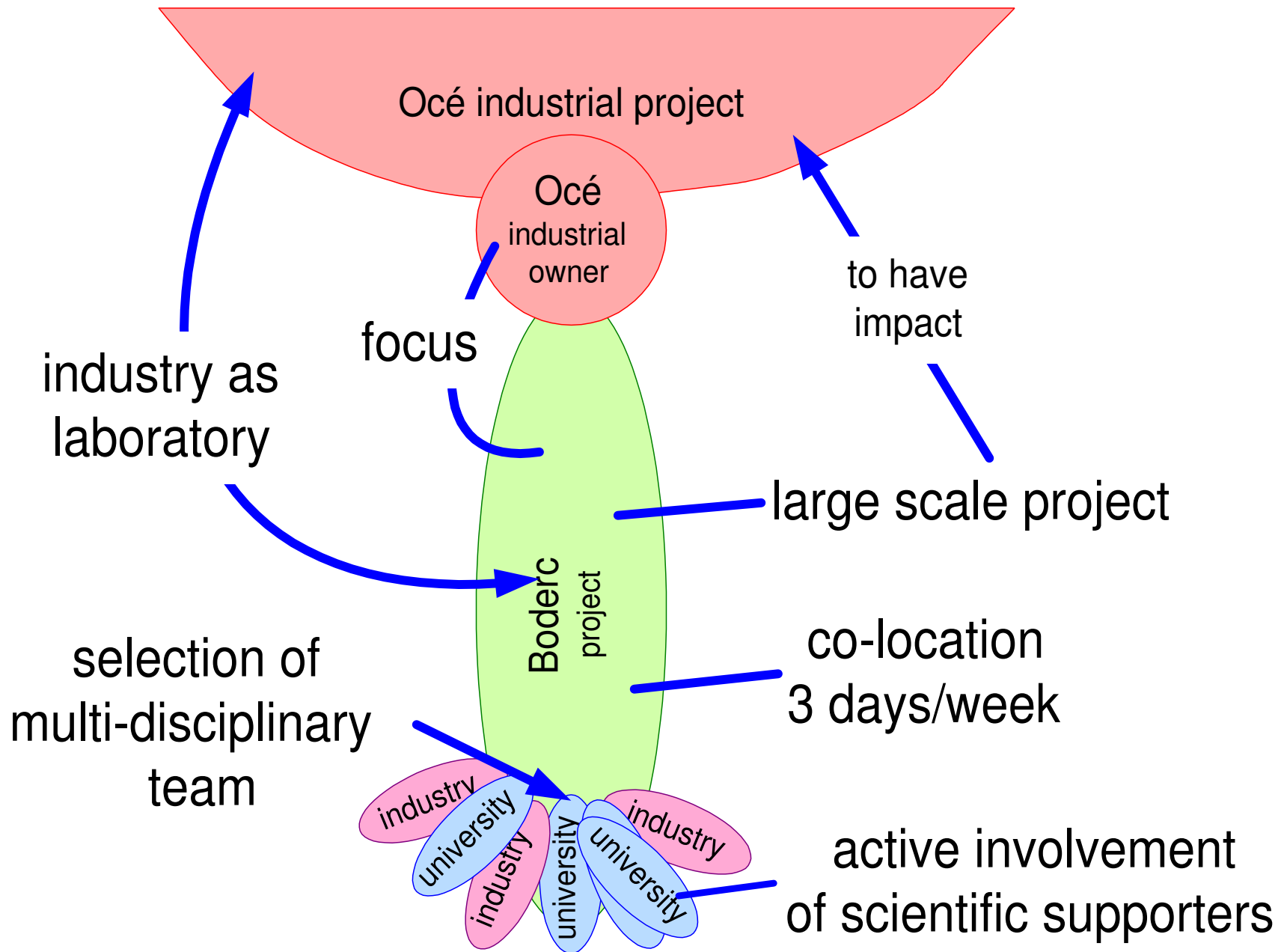
Project as carrier for capability development



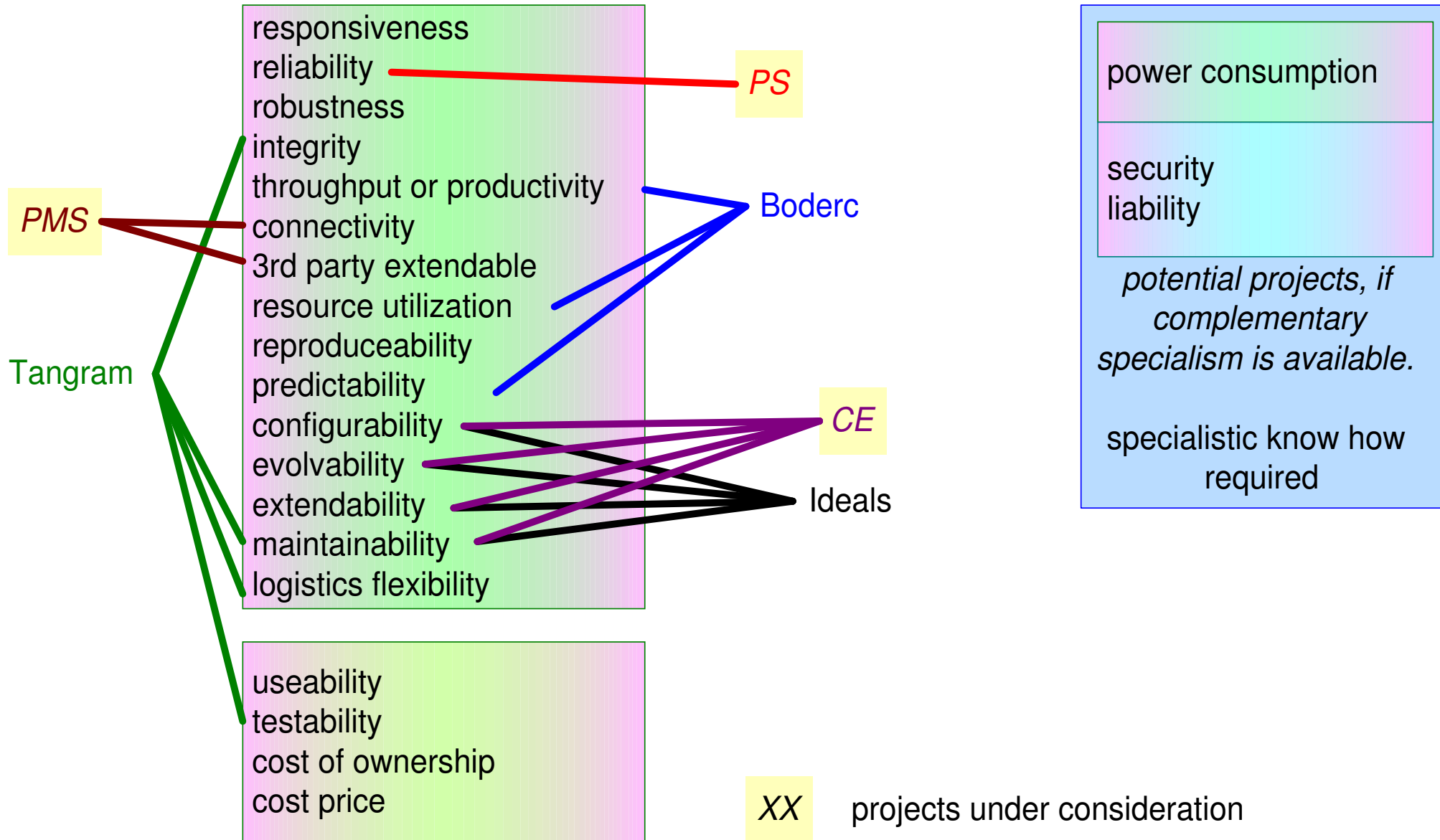
ESI project approach



Critical Success Factors for projects



Mapping of capabilities to projects



Role of Embedded Systems Institute 2

project management
capability coaching
facilitation

knowledge exchange
administration
housing
means, tools

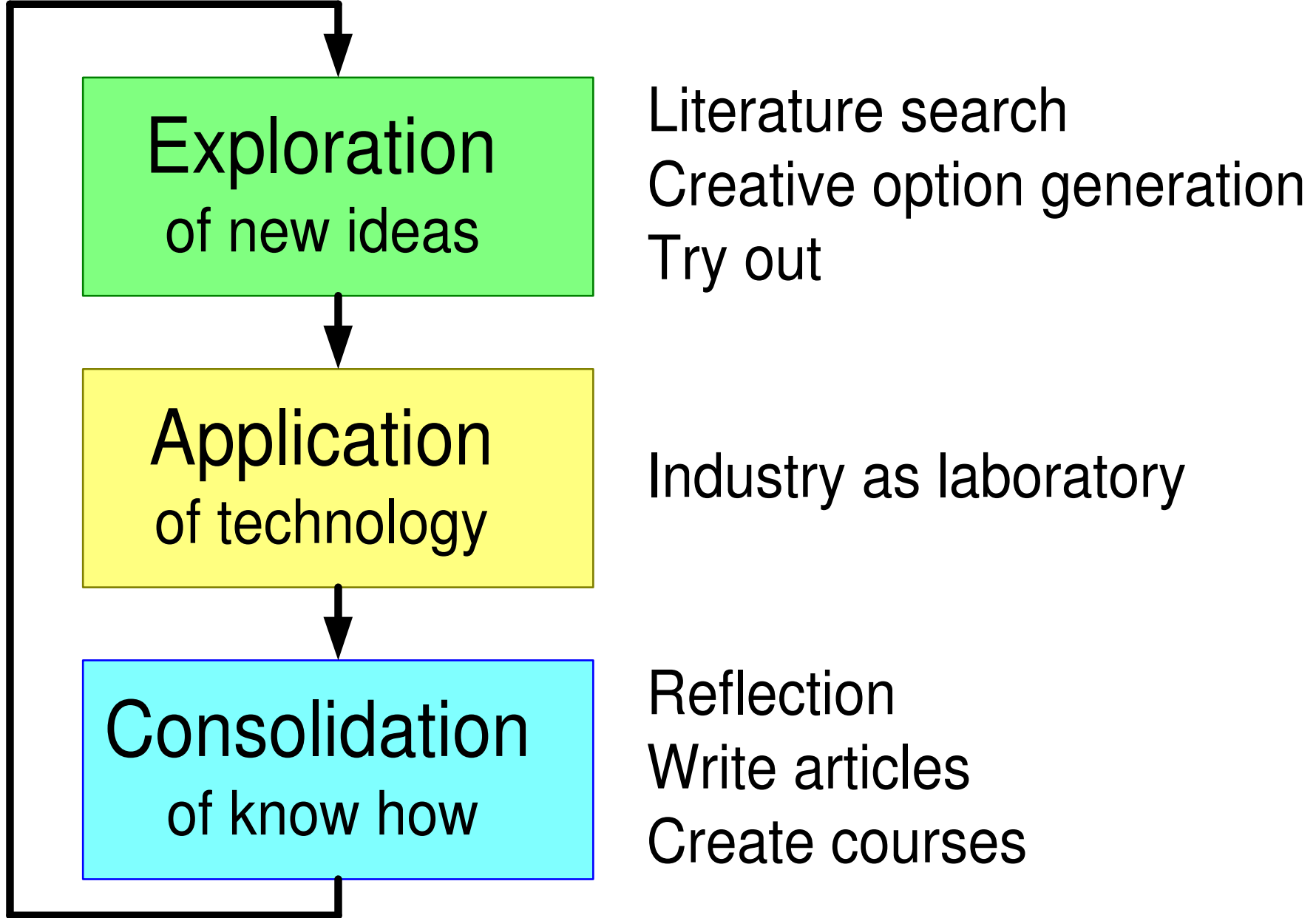
project

capability

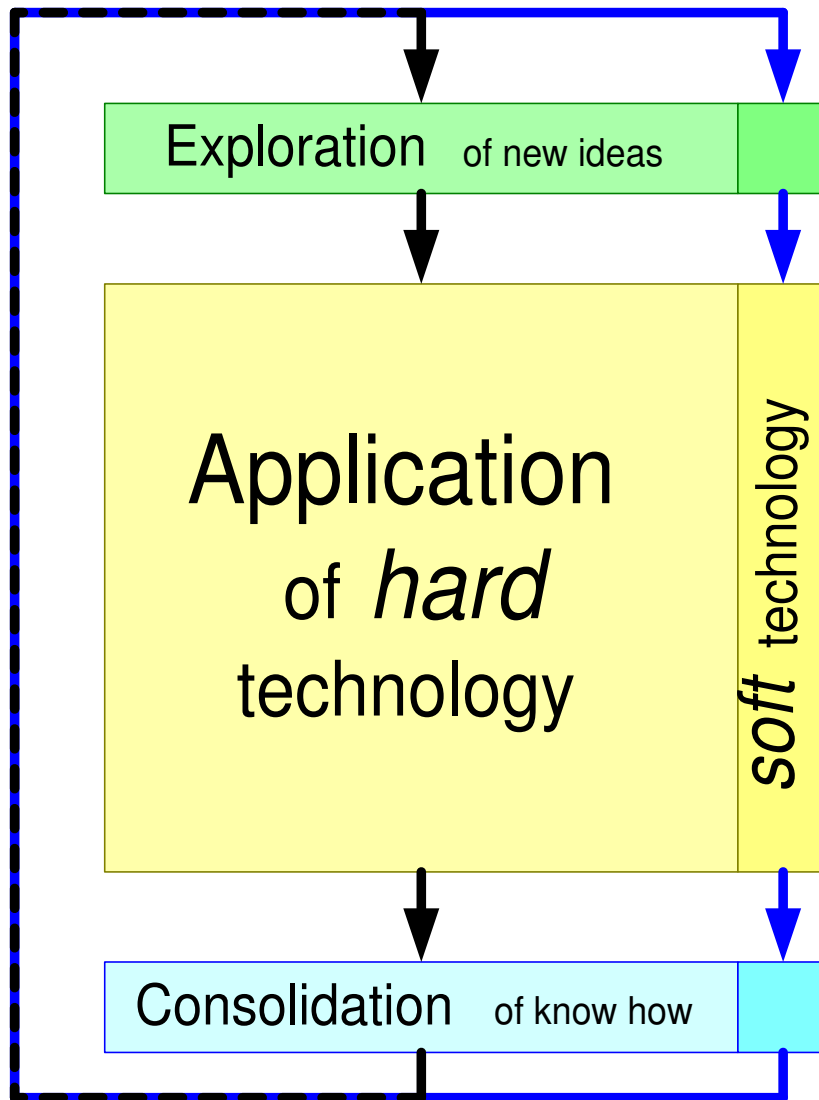
project initiation
knowledge consolidation
facilitation

knowledge management
knowledge transfer
general management

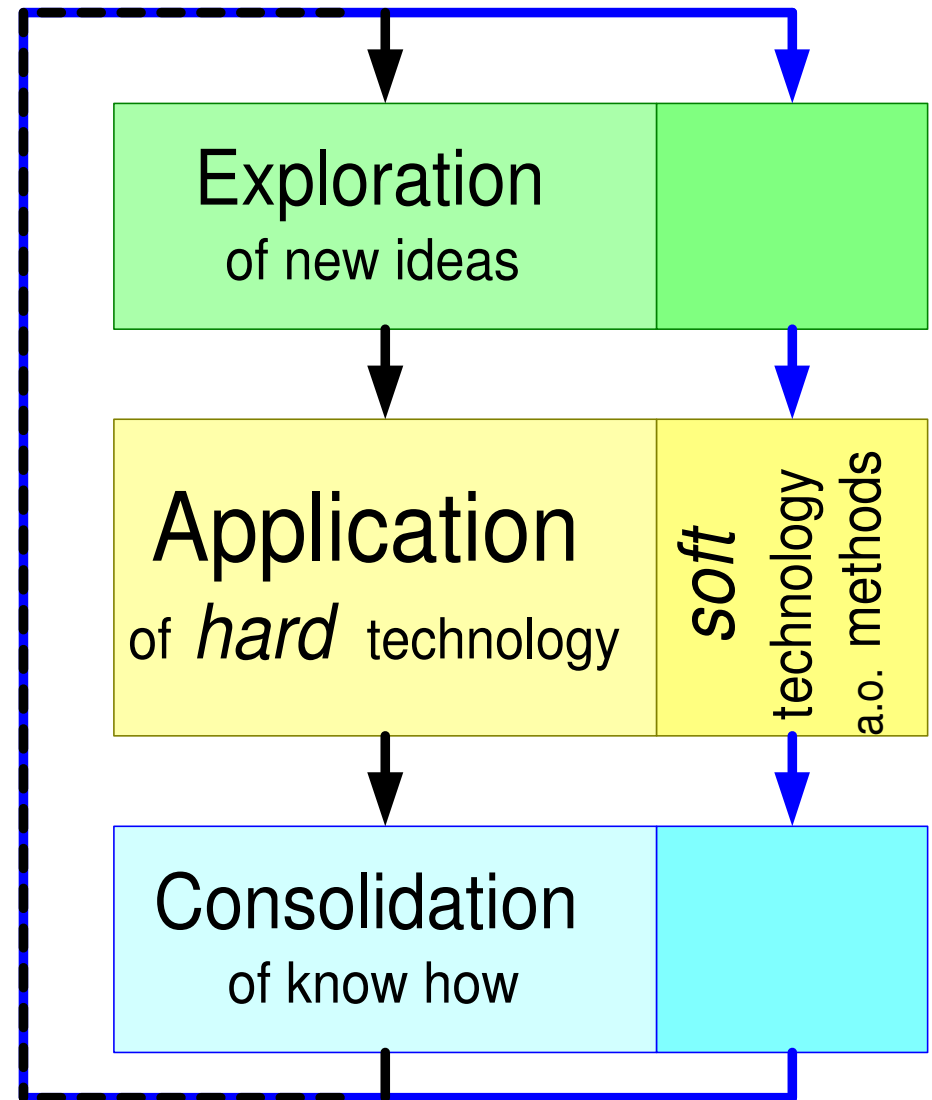
Technology Management Cycle



Industry as laboratory

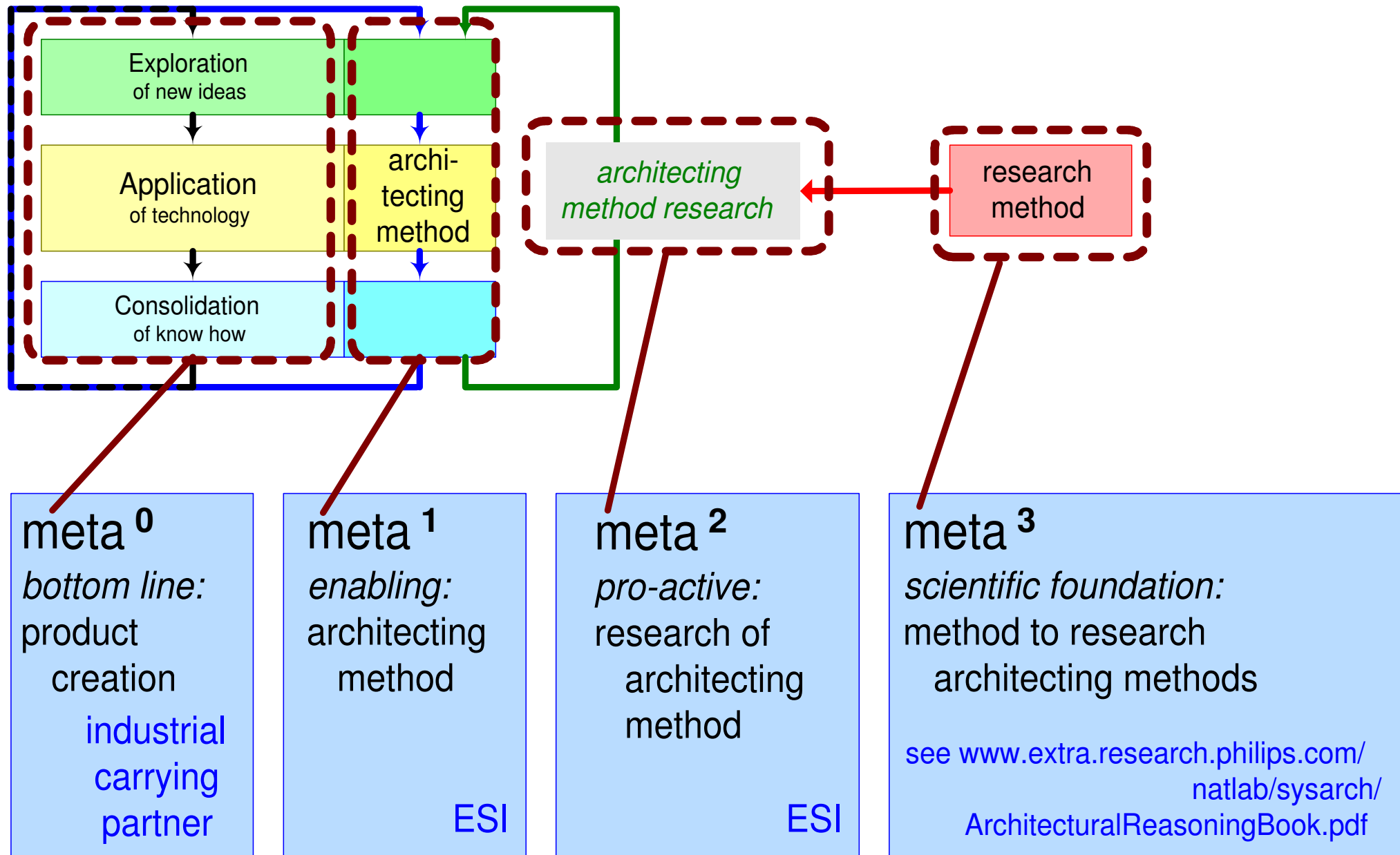


Product Development

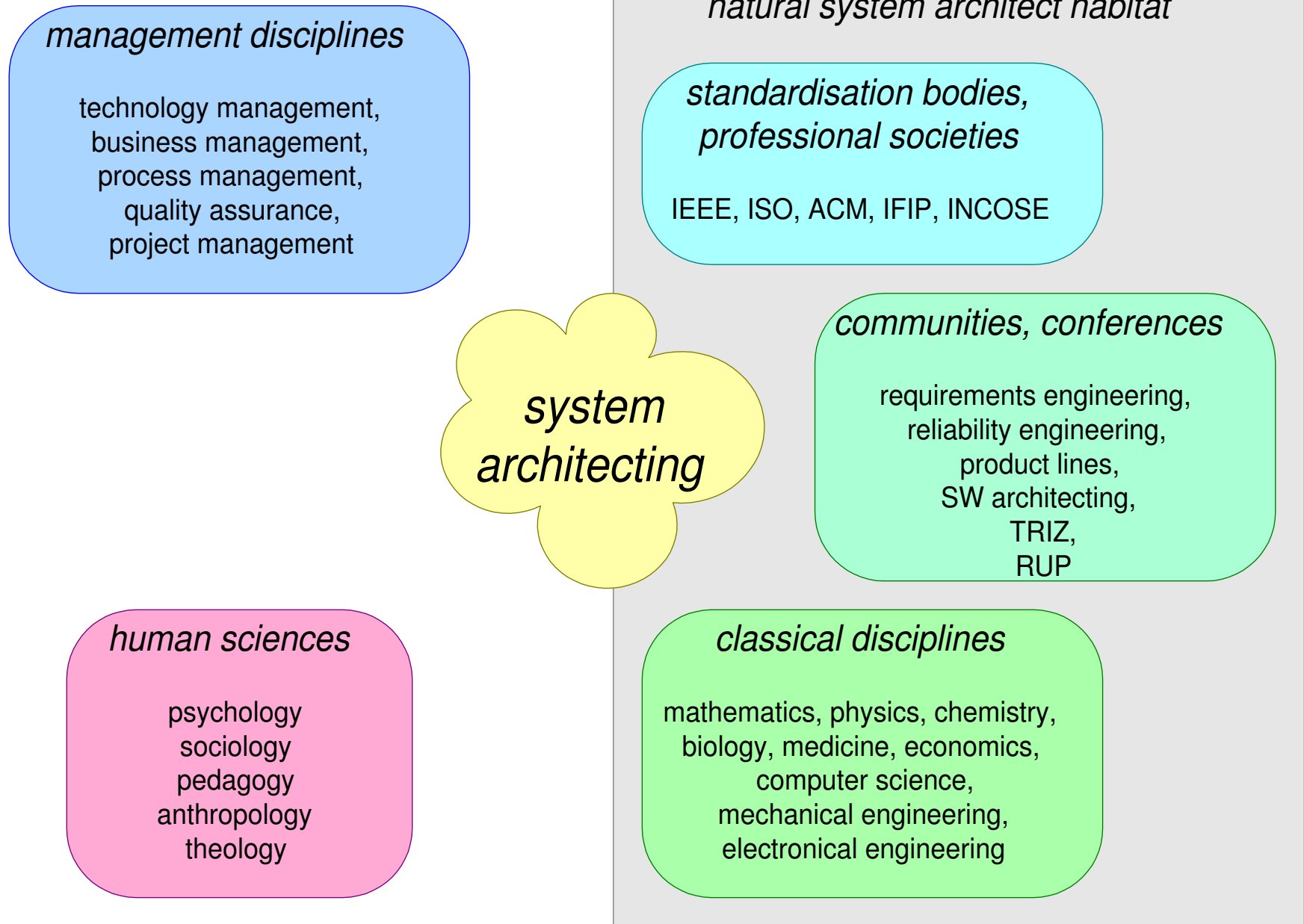


Research

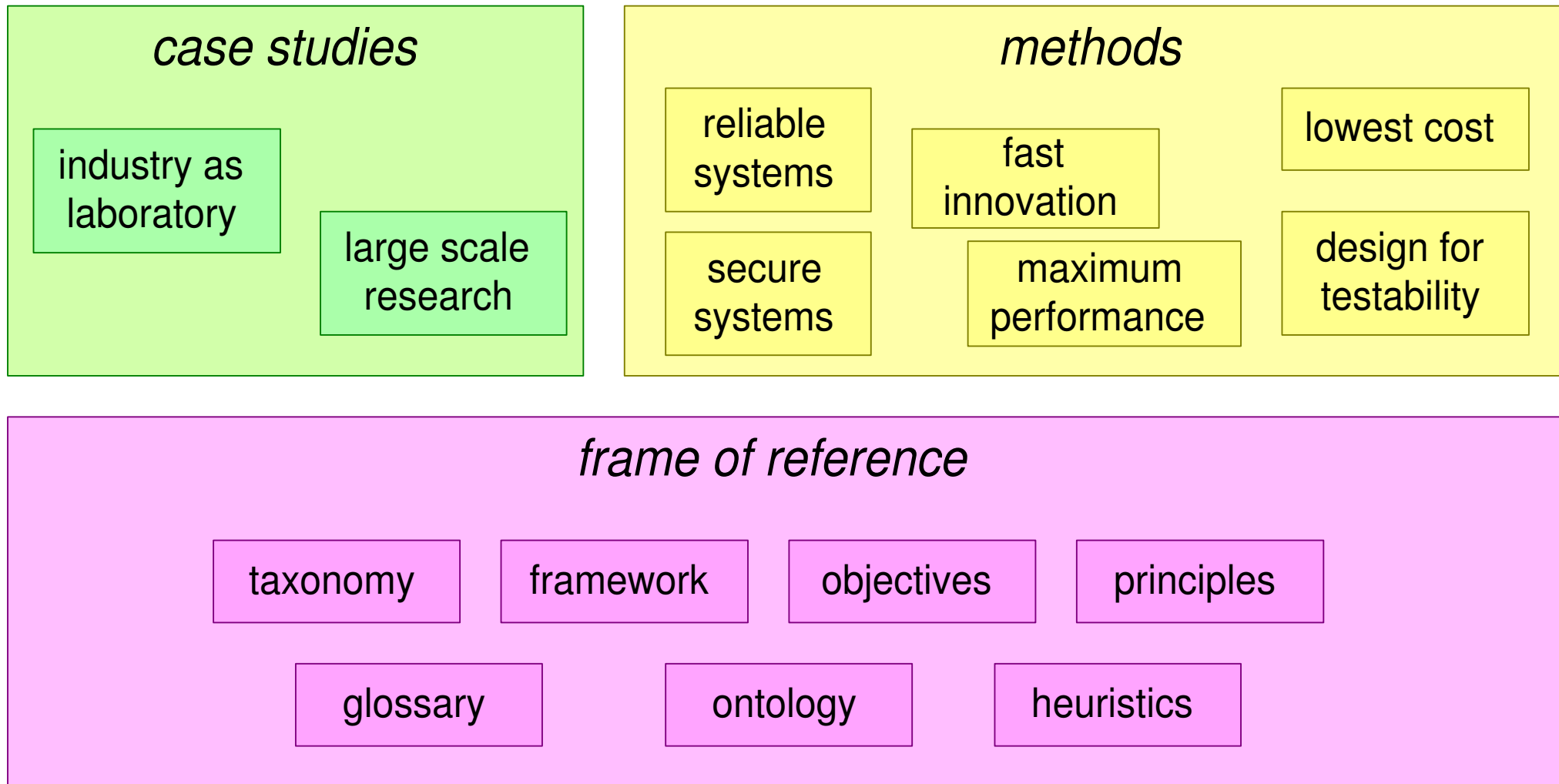
Moving in the *meta* direction



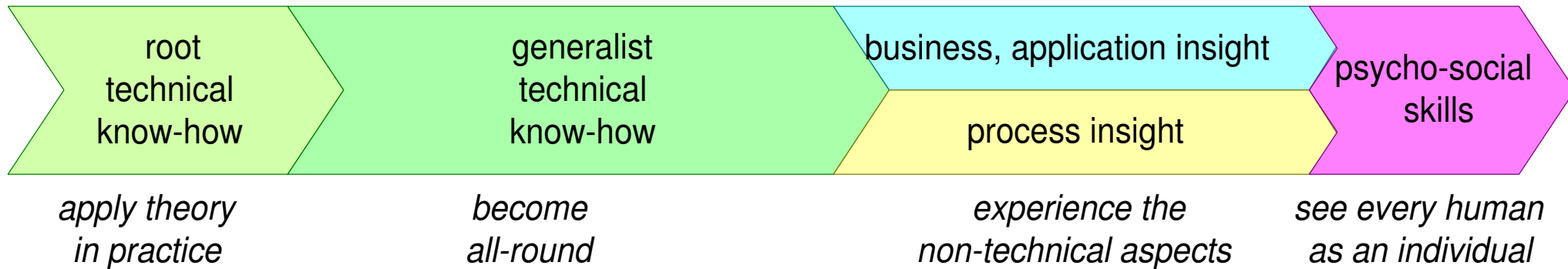
The context of architecting



System architecting research: to do



Curriculum system architecting



architecture school

