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.

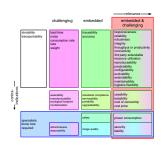
The ESI approach with projects and capabilities is described. The contribution of ESI is explained. Some background is provided about the technology management and research method aspects.

Distribution

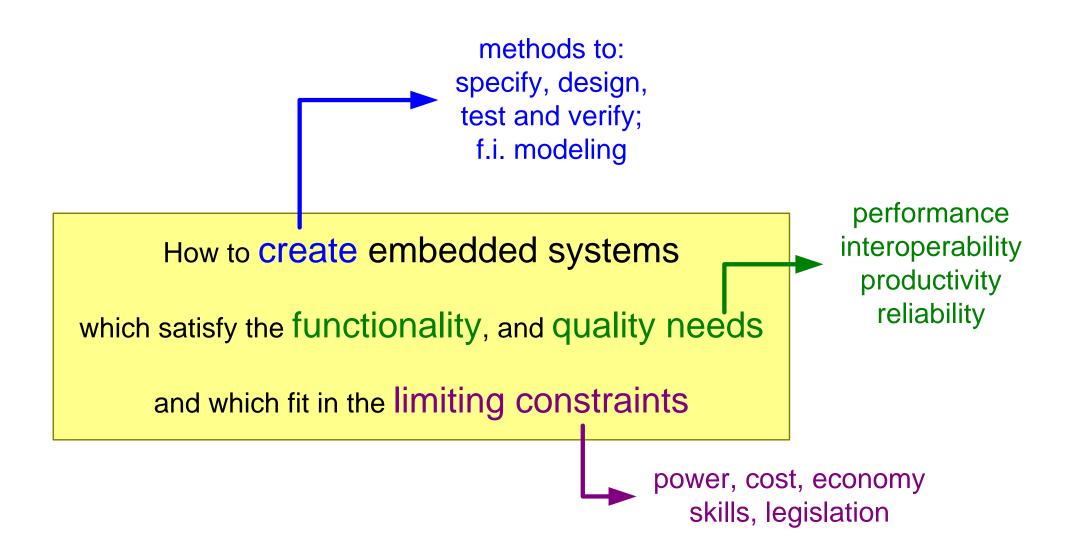
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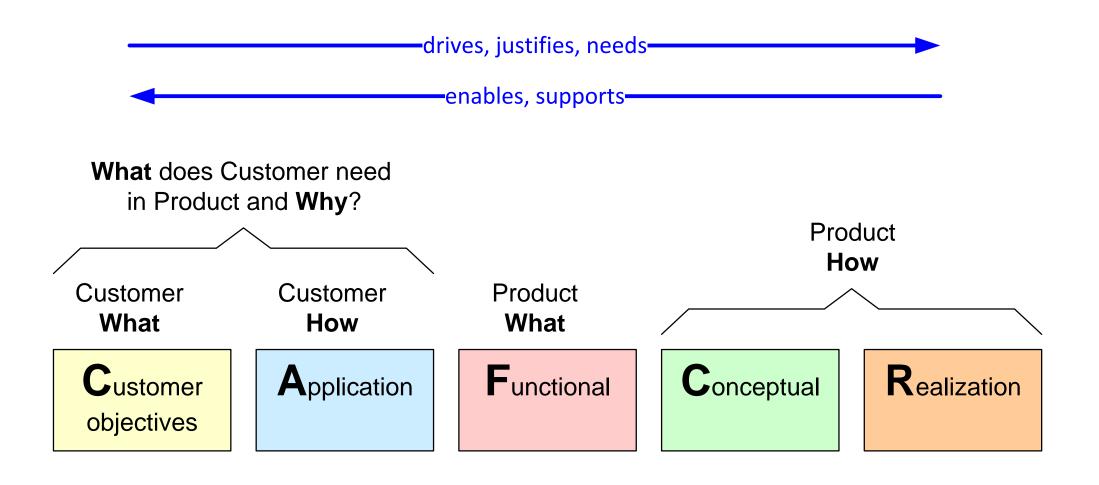


Role of Embedded Systems Institute ESI



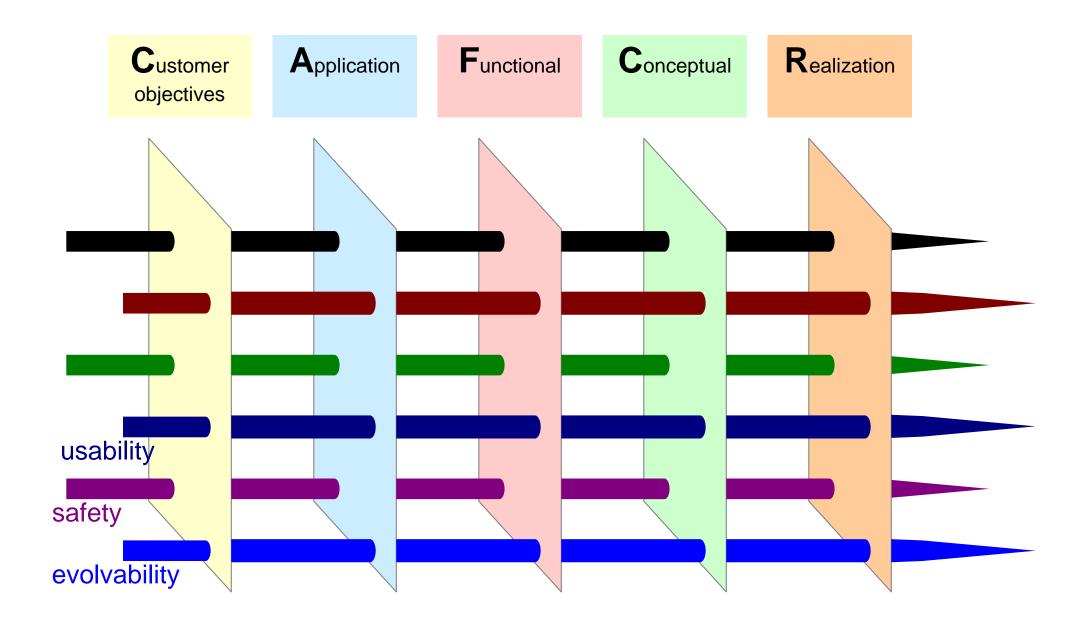


The "CAFCR" model



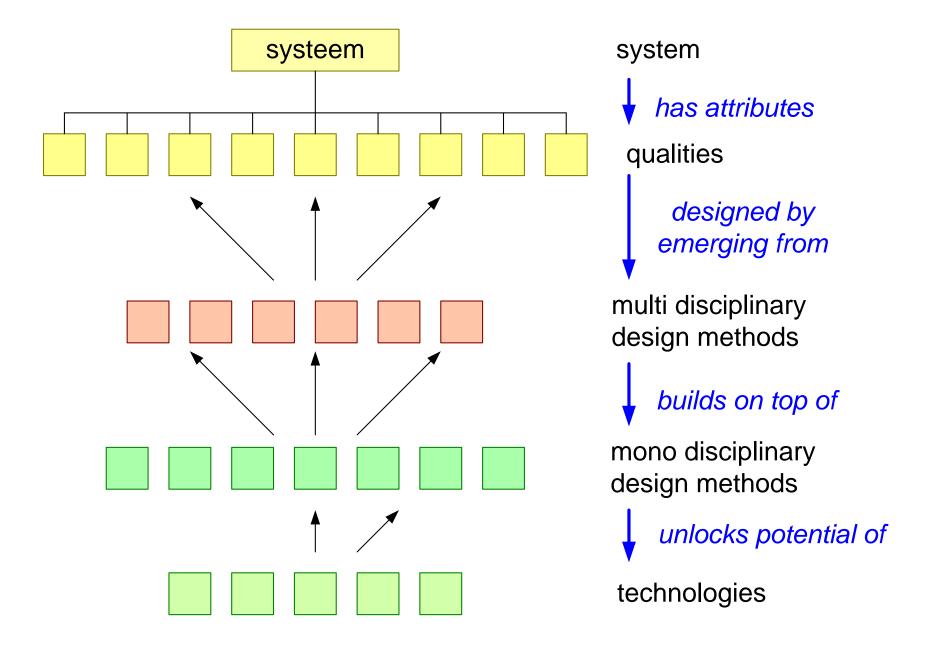


Qualities as basis for capabilities



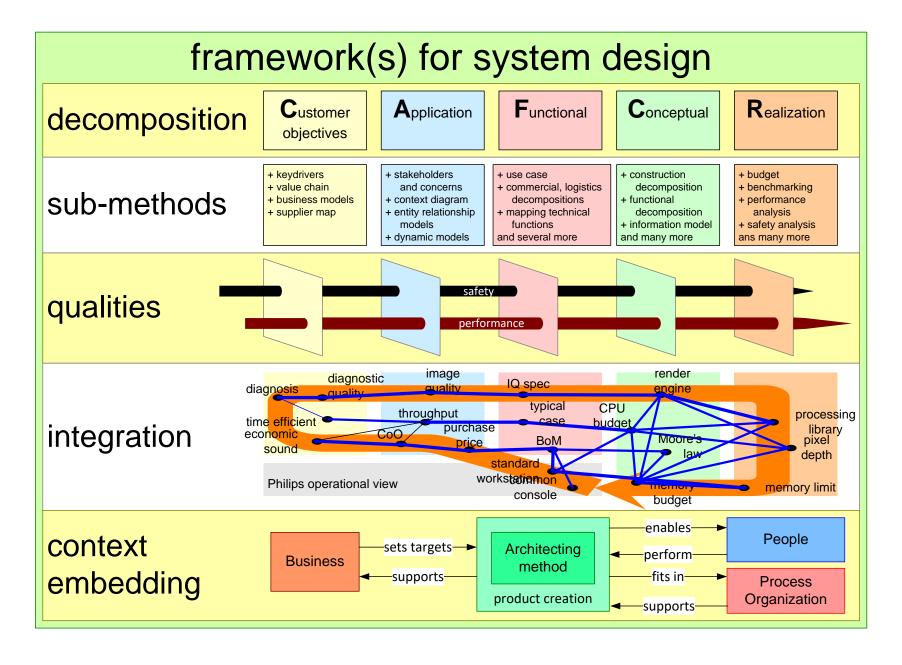


Multi Disciplinary Builds on Mono Disciplinary





Overview of methods in relation with context





Checklist of system qualities

serviceable usable ecological interoperable usability ecological footprint serviceability connectivity attractiveness contamination 3rd party extendible configurability responsiveness installability noise image quality disposability liable wearability future proof storability liability transportability testability evolvability down to earth dependable traceability portability standards compliance safety attributes upgradeability security extendibility cost price efficient reliability maintainability power consumption robustness resource utilization consumption rate integrity cost of ownership (water, air, availability logistics friendly chemicals, effective consistent et cetera) manufacturability throughput or size, weight reproducibility logistics flexibility



accuracy

predictability

productivity

lead time

Domain specific aspects

usable useability attractiveness responsiveness image quality wearability storability transportability reliable safety security reliability robustness

throughput or productivity

integrity

effective

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

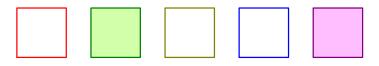
embedded (software intensive, electronics)

process, organisation, soft skills

specialistic

challenging

preferred profile:



-1

4

-1

-3

2

Ranking of all criterions

usable useability attractiveness responsiveness image quality wearability storability transportability reliable safety security reliability robustness integrity effective throughput or

productivity

interoperable

con<mark>ne</mark>ctivity 3rd party extendable

liable

liability
testability
traceability
standards compliance

efficient

resource utilization cost of ownership

consistent

reproduceability

serviceable

se<mark>rvicea</mark>bility configurability installability

future proof

evolvability portability upgradeability extendability maintainability

logistics friendly

manufacturability logistics flexibility lead time

ecological

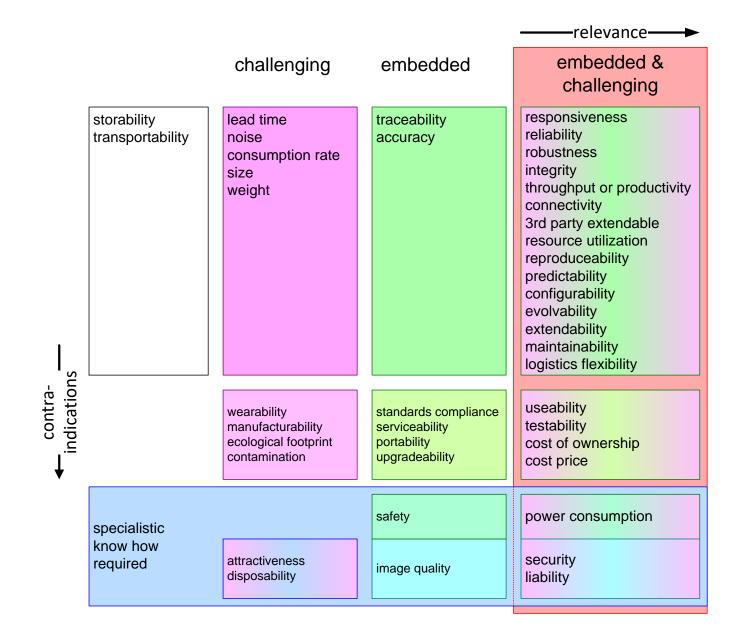
ecological footprint contamination noise disposability

down to earth attributes

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

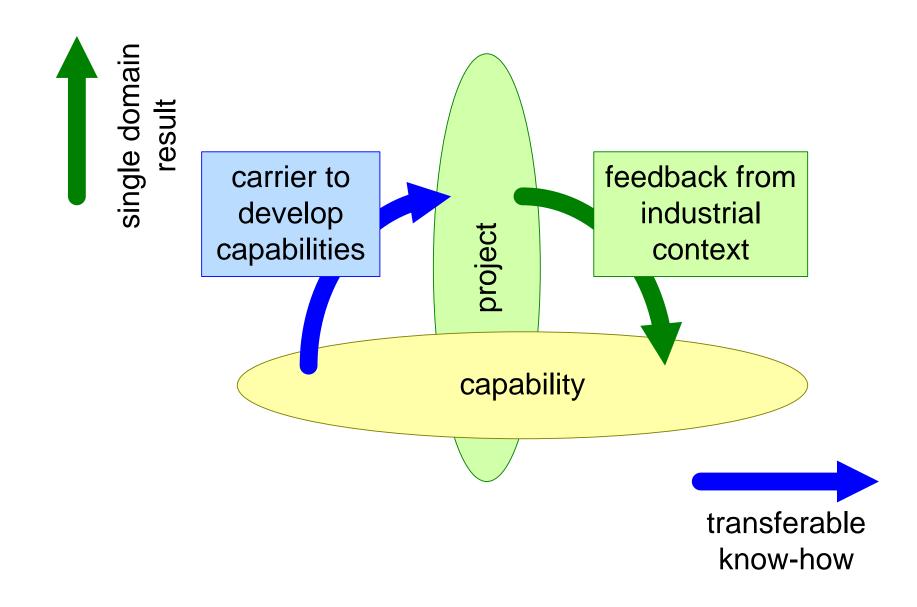


Relevance for ESI quality map



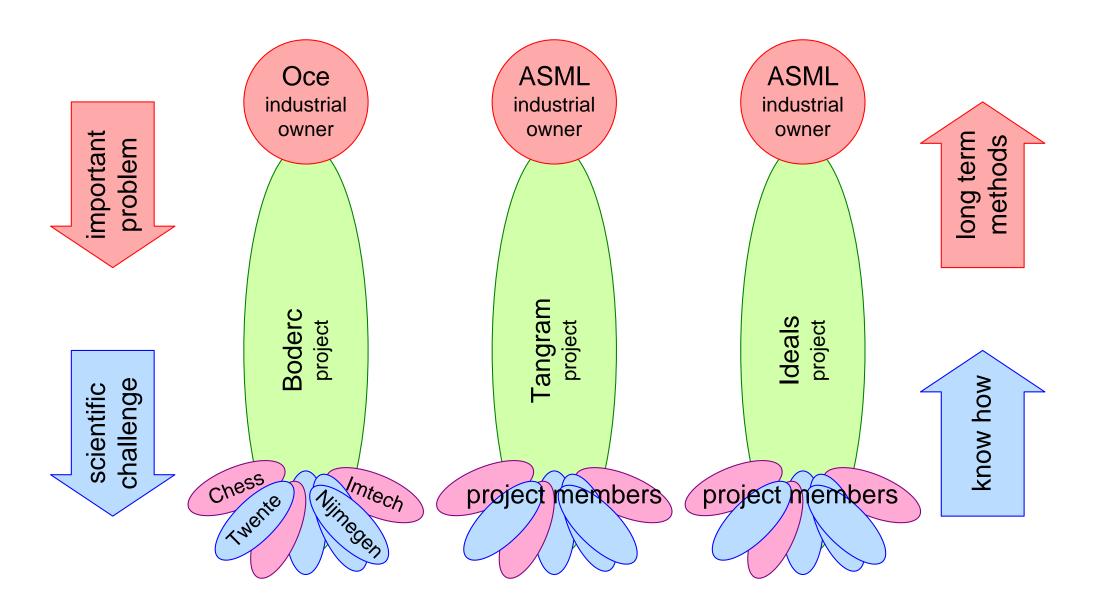


Project as carrier for capability development



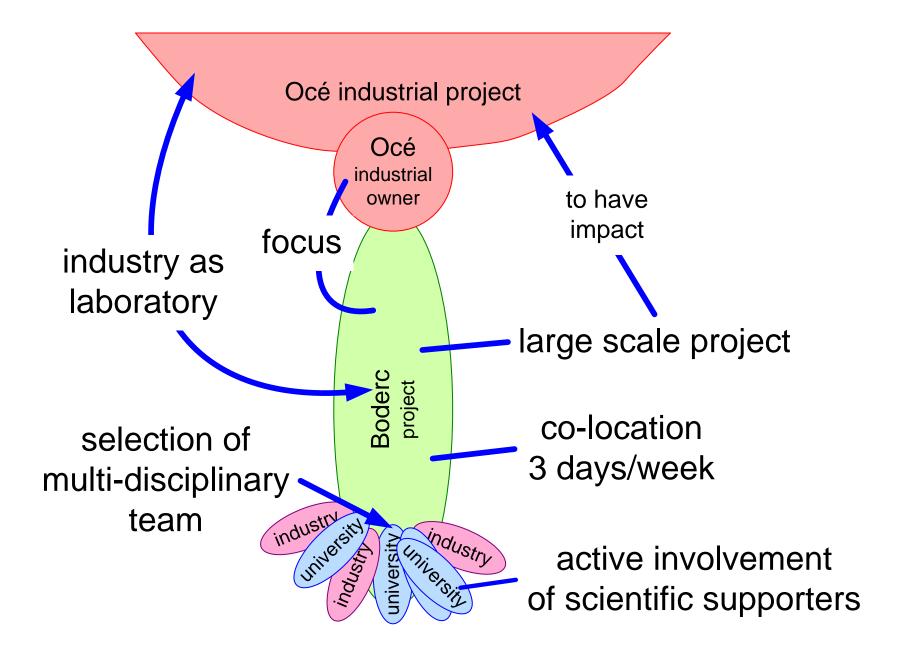


ESI project approach



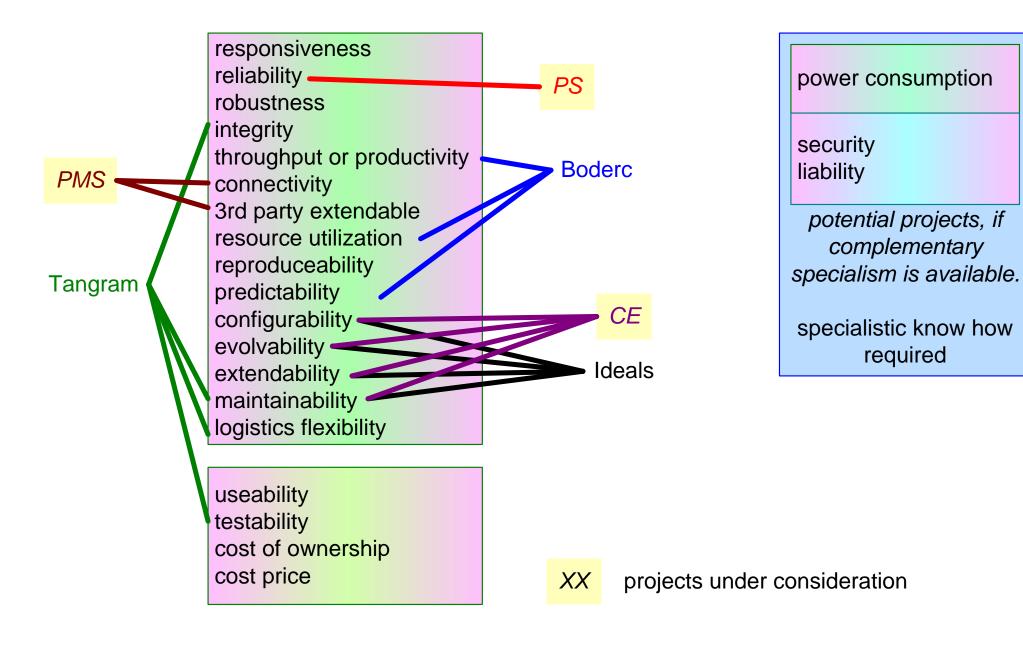


Critical Success Factors for projects





Mapping of capabilities to projects



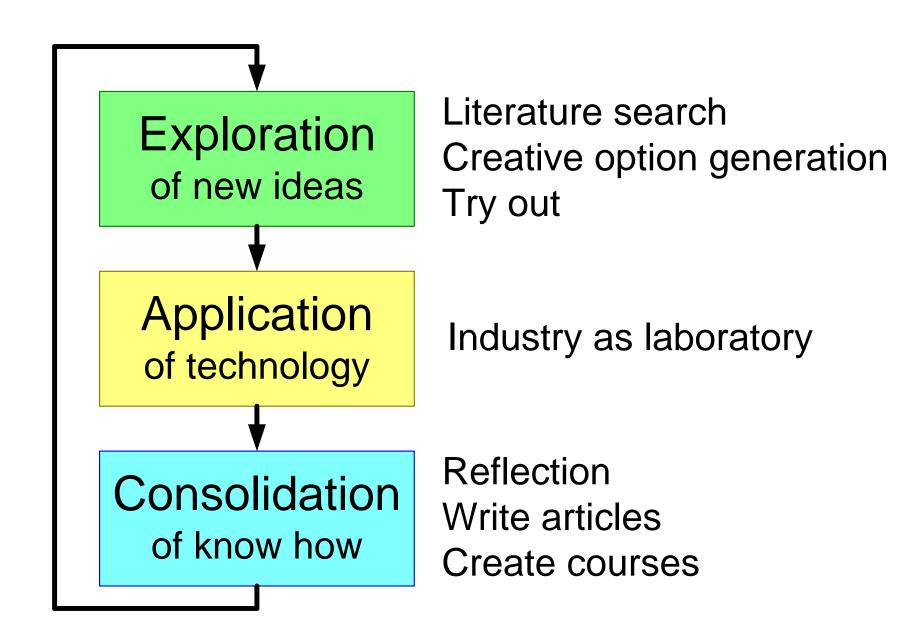


Role of Embedded Systems Institute 2

project management capability coaching project facilitation knowledge exchange administration housing means, tools capability project initiation knowledge consolidation facilitation knowledge management knowledge transfer general management

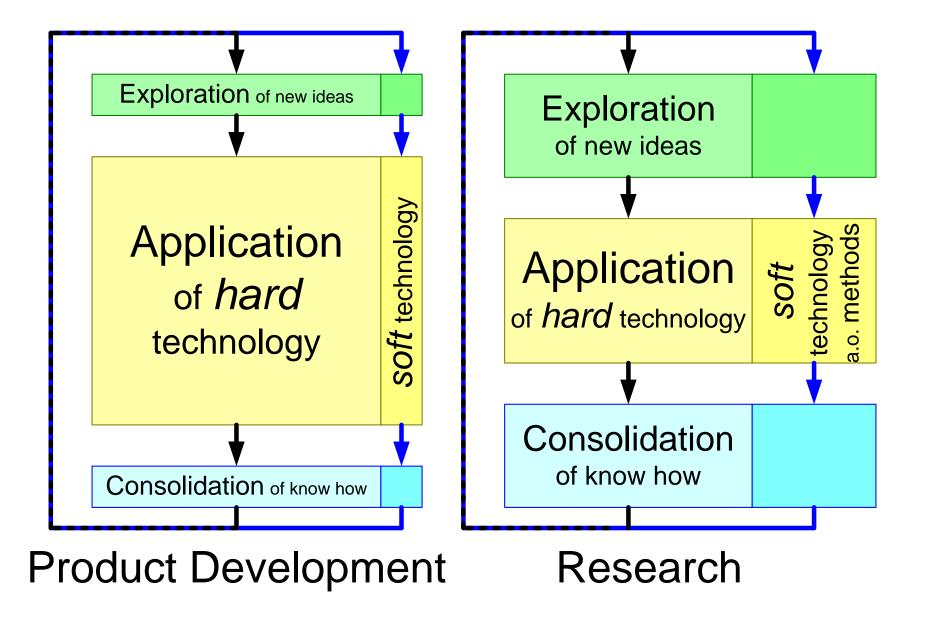


Technology Management Cycle



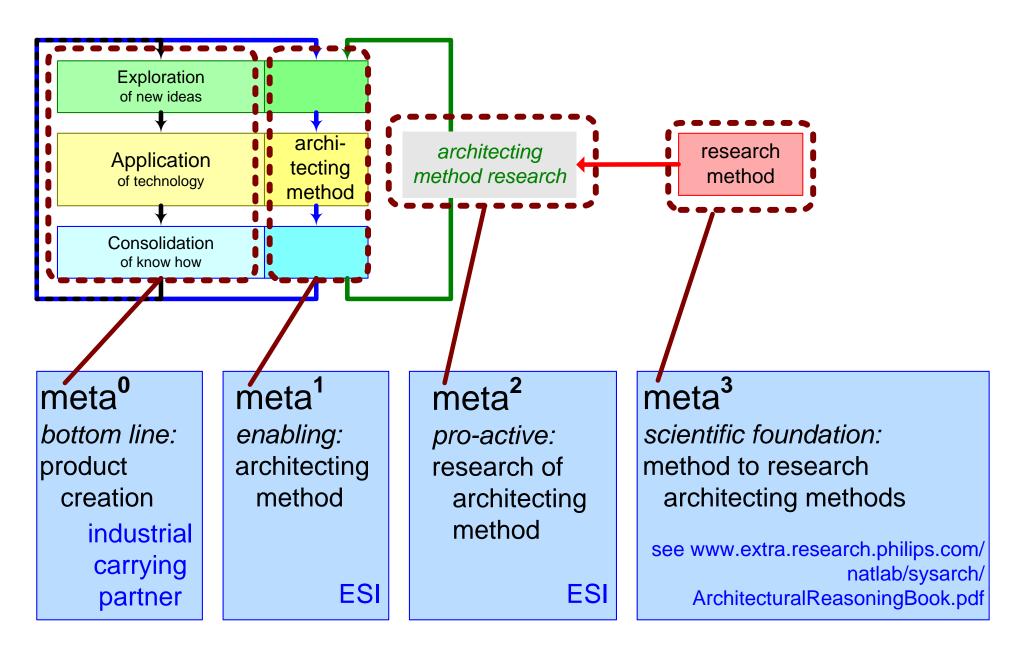


Industry as laboratory





Moving in the *meta* direction





The context of architecting

management disciplines

technology management, business management, process management, quality assurance, project management

natural system architect habitat

standardisation bodies, professional societies

IEEE, ISO, ACM, IFIP, INCOSE

system architecting

communities, conferences

requirements engineering, reliability engineering, product lines, SW architecting, TRIZ, RUP

human sciences

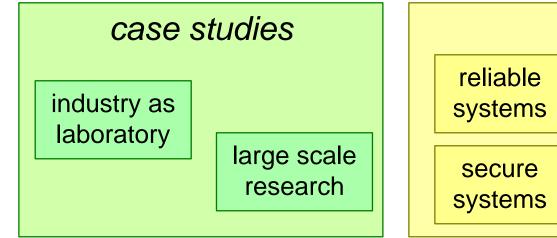
psychology sociology pedagogy anthropology theology

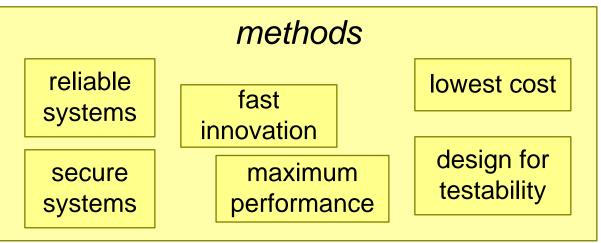
classical disciplines

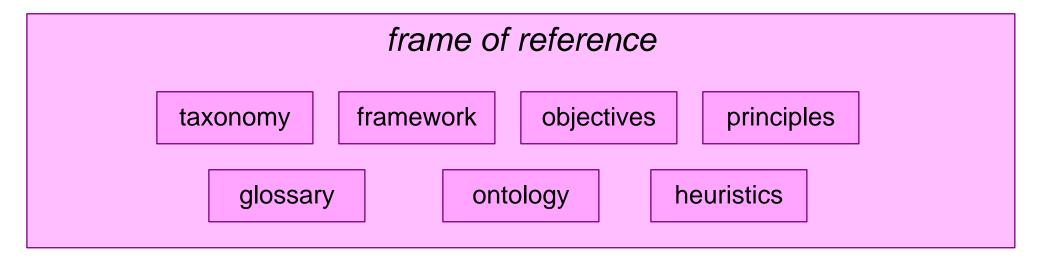
mathematics, physics, chemistry, biology, medicine, economics, computer science, mechanical engineering, electronical engineering



System architecting research: to do









Curriculum system architecting

