

Architecture-based Services Innovation

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Enterprise Engineering Team

www.ee-team.eu

What:

- Team of researchers
- Multi-node
- Multi-disciplinary
- Aligned research agenda
- Joint publications
- Joint projects

Hosts:

- CRP Henri Tudor, LU [**HQ**]
- HAN University of Applied Sciences, NL
- Radboud University Nijmegen, NL
- University of Luxembourg, LU

Focus

- *Enterprise engineering*

Informed design of IT-reliant enterprises,
and their transformation

Takes place in a social context ...

- *Enterprise sociology*

Culture, skills, attitudes, communication, ...

Is a model intensive activity ...

- *Enterprise modelling*

Models, languages, collaborative modelling, ...

Agenda

- ❖ Business service innovation
- ❖ Enterprise architecture
- ❖ Architecting for innovation

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Enterprise

A social system with a purpose

Supported/enabled by resources:

- Social
- Technological
- Economical
- ...

Business services

Service performance:

The establishment, by some actor, of a result/effect that is of (anticipated) value to some actor

Business service performance:

The actor doing the service performance does this as part of their core business

Business services

Responsible actors:

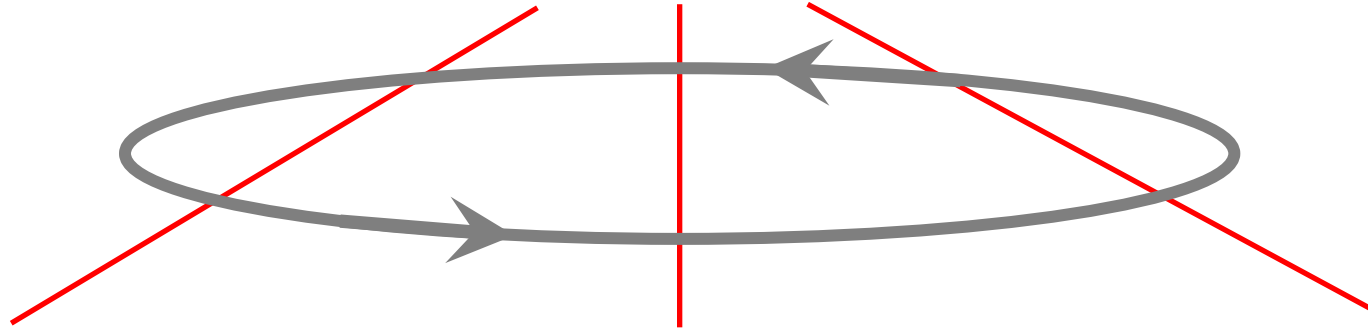
Actors in business services are socially/ethically responsible

IS or IT cannot *perform* business services

They can be (the key) part of their execution

But ... they are never responsible

Business service innovation

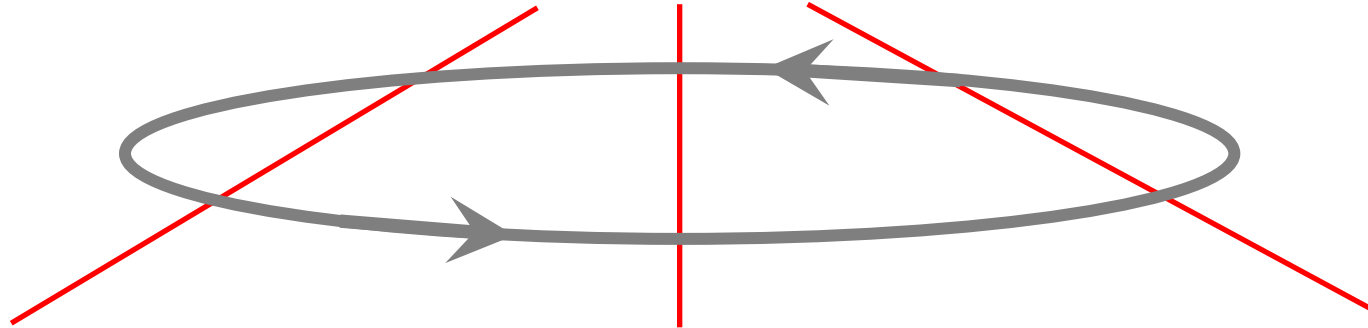


Appreciating Designing Establishing

Subject of design:

- Enterprise
- Transformation(s)

Enterprise transformation

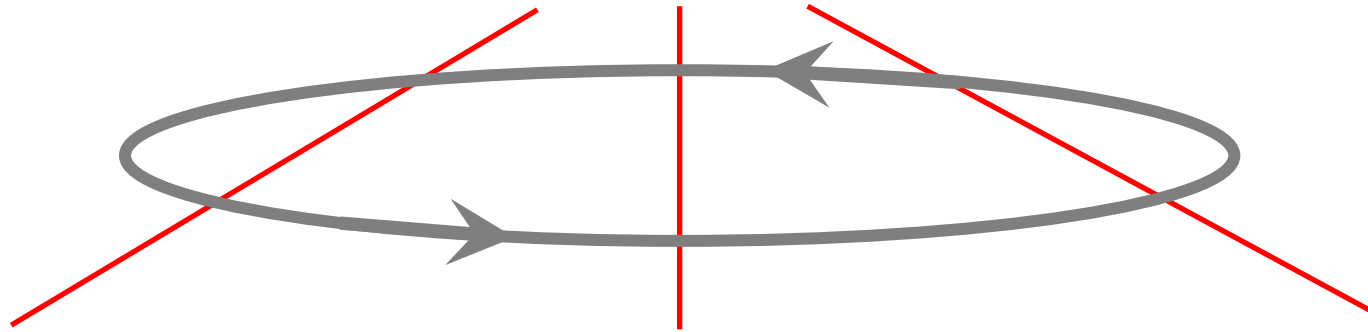


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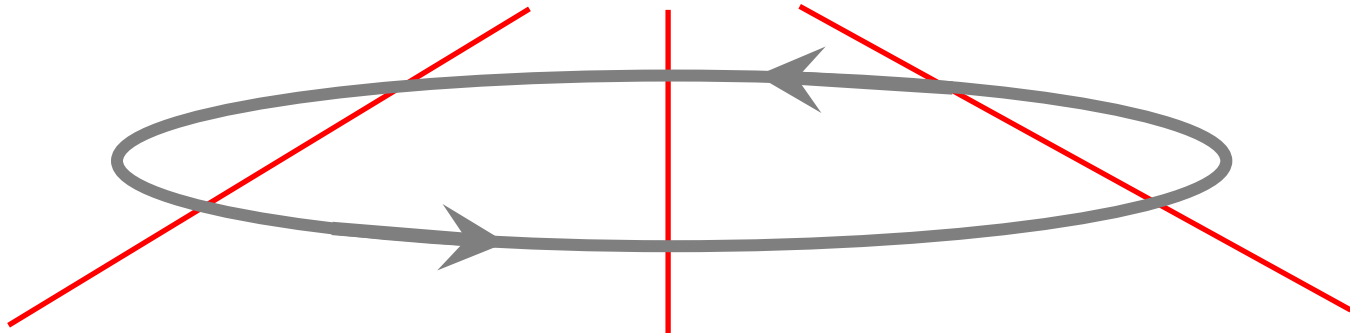
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Appreciating Designing Establishing



Envisioning Elaborating Selecting

Dimensions for transformation initiation

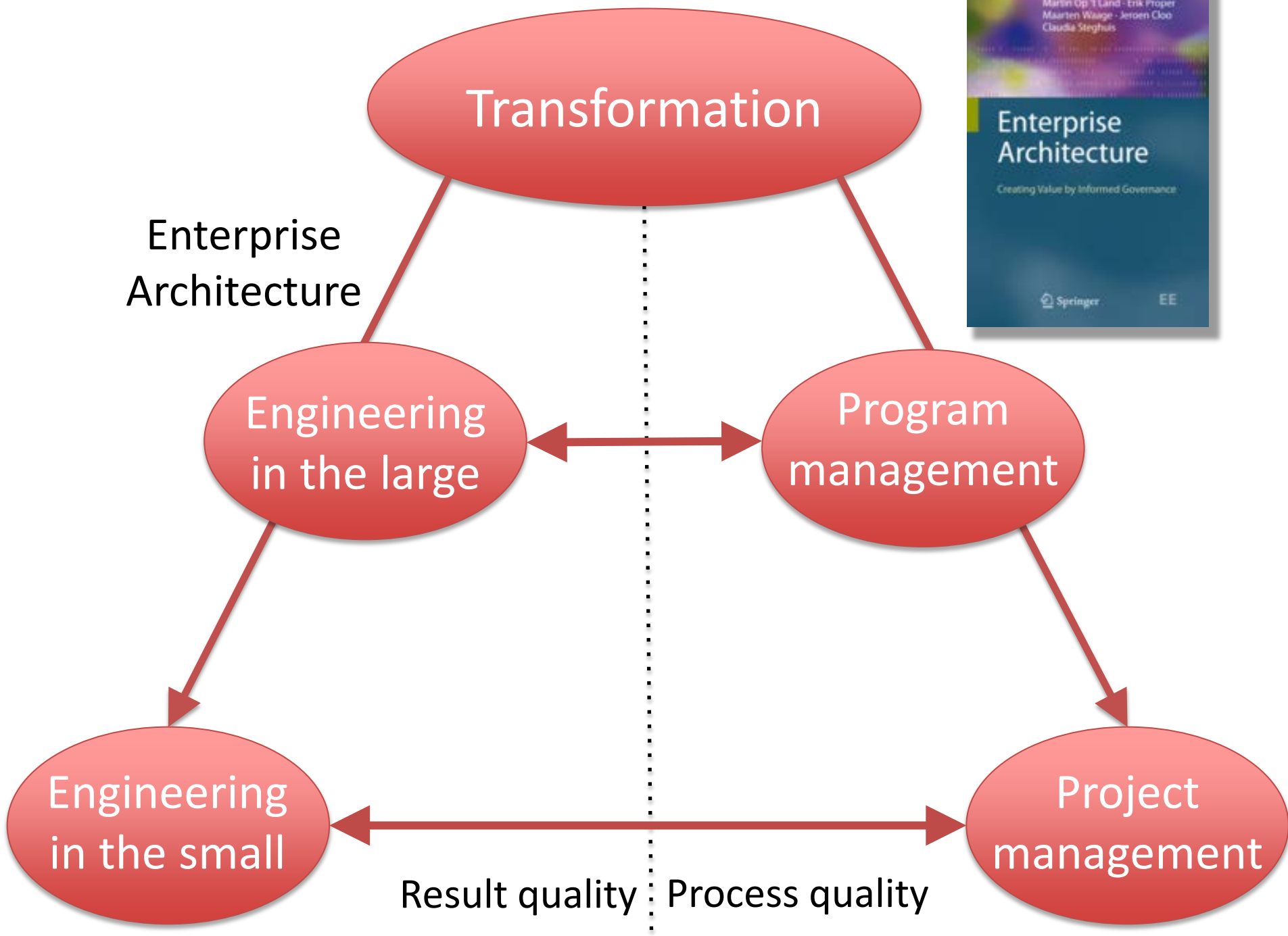
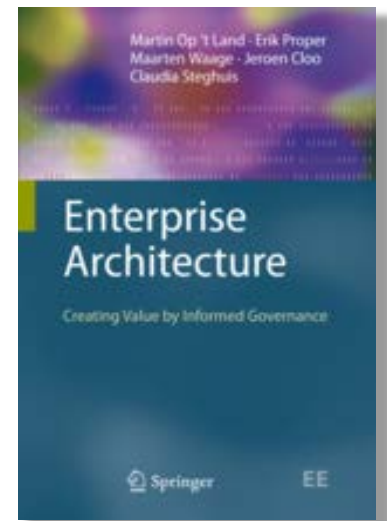
- Location
 - De-central
 - Central
- Time
 - Ad-hoc
 - Planned

Enterprise transformations

- How to steer transformations?
- Do we want to?

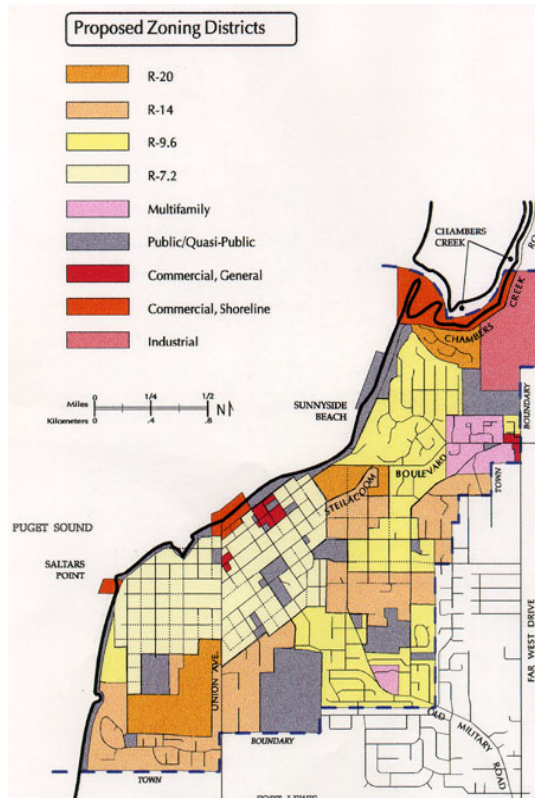
Agenda

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Role of EA for ET

Cityplanning



Districtplanning



Building Designing



Supports decision making

Supports realisation

A.29 Application functionality is available through an enterprise portal

Type of information: application

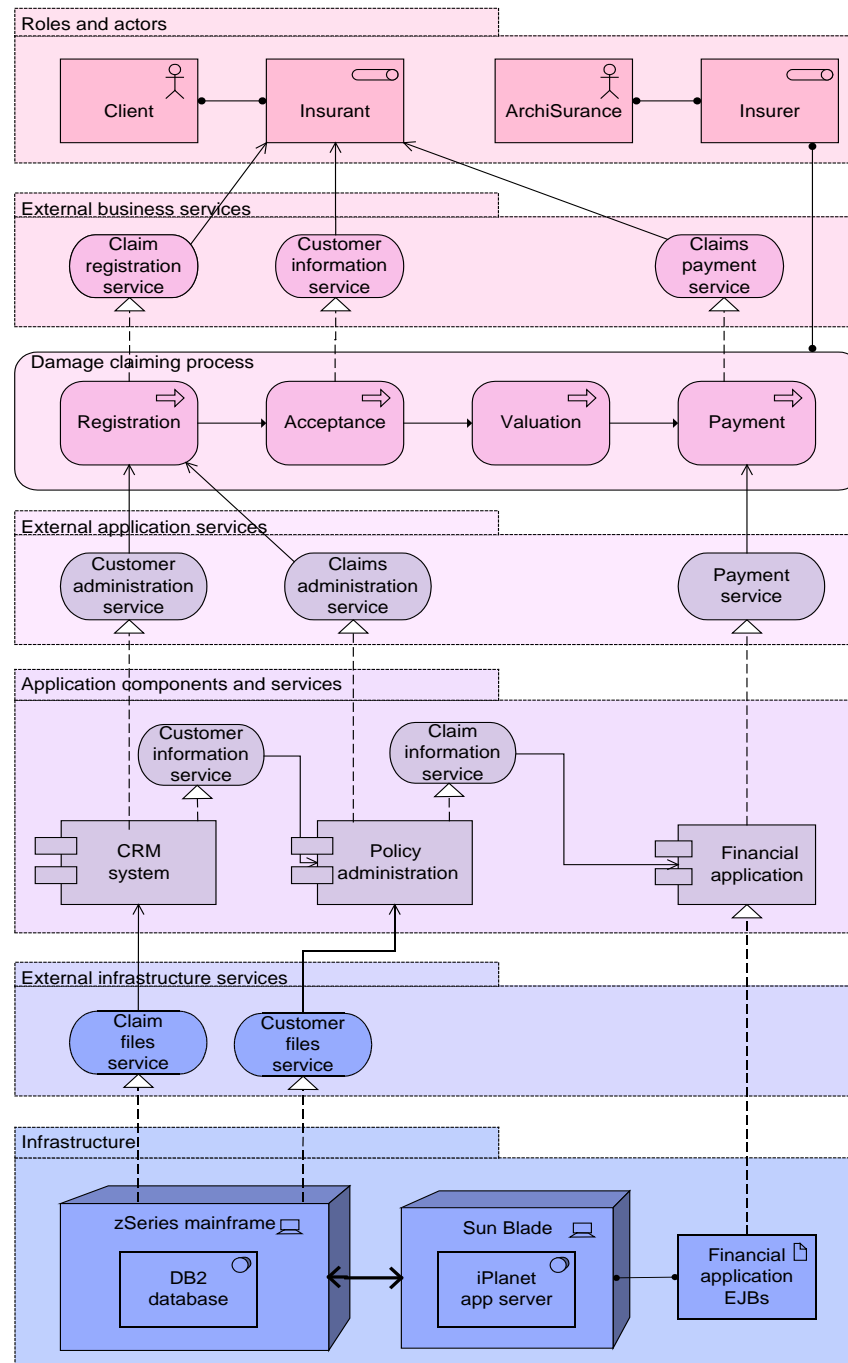
Quality attributes: usability

Rationale:

- A portal provides functionality that is targeted at the role and personal preferences of the user, optimally supporting users in their work.
- A portal provides a single point of access, and integration of functionality at the glass, relieving users from manually finding and integrating functionality.
- A portal can provide single sign-on to users.

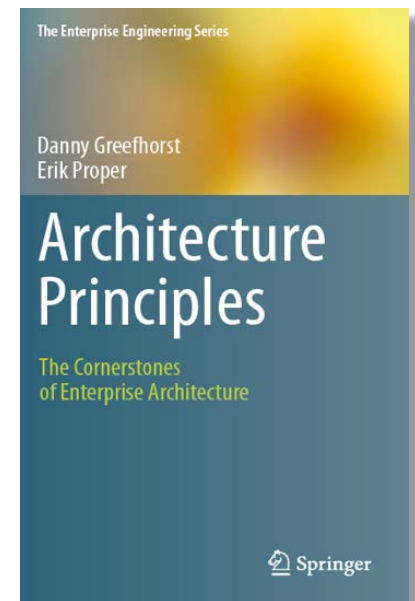
Implications:

- There is an Enterprise Portal that provides access to all application functionality.
- All applications are portal-enabled, exposing their functionality as portlets/web parts.



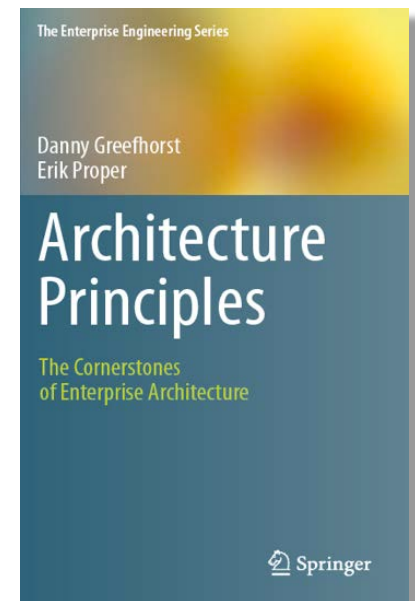
Architecture

- Those properties of an artifact that are necessary and sufficient to meet its essential requirements

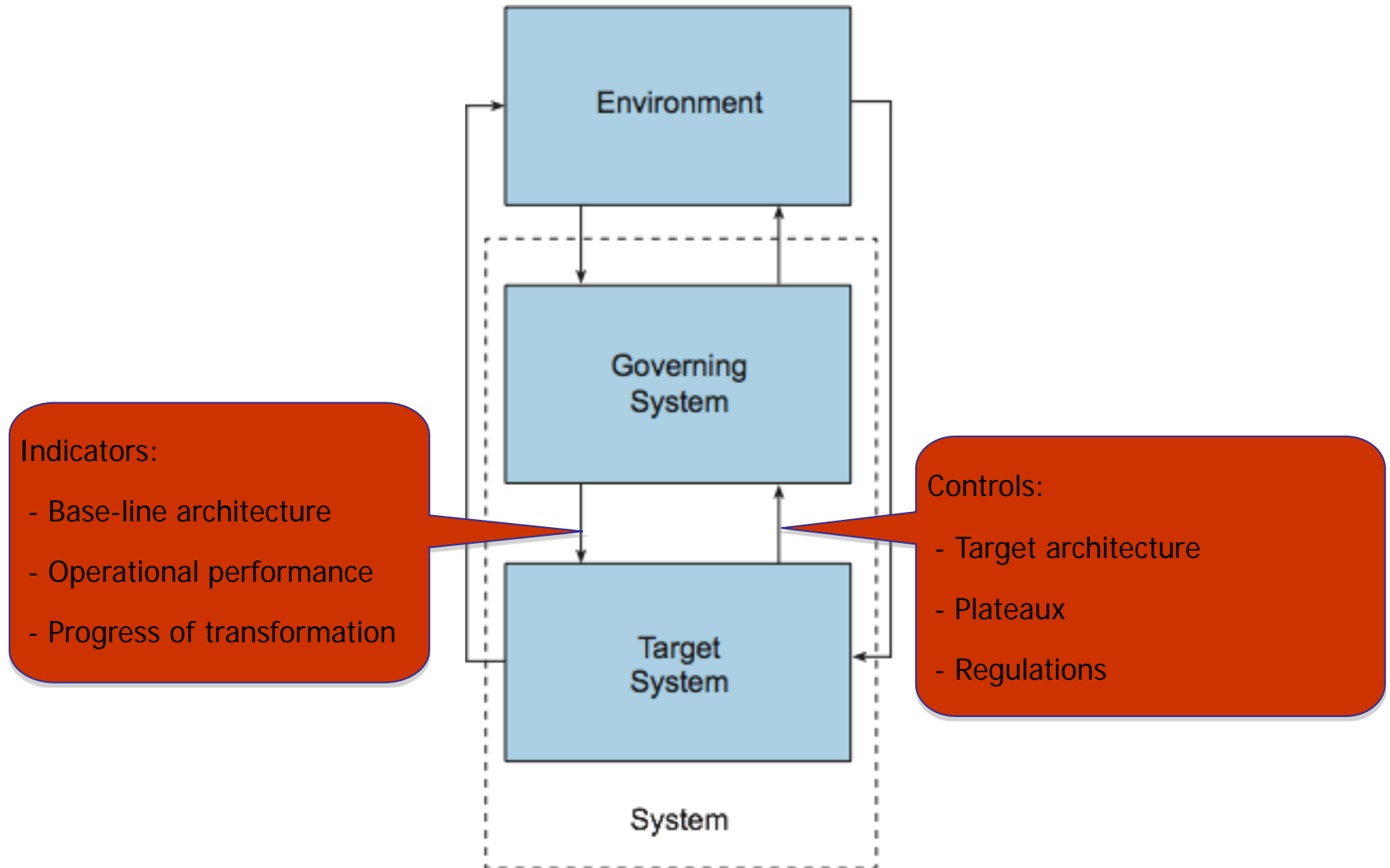


Enterprise architecture

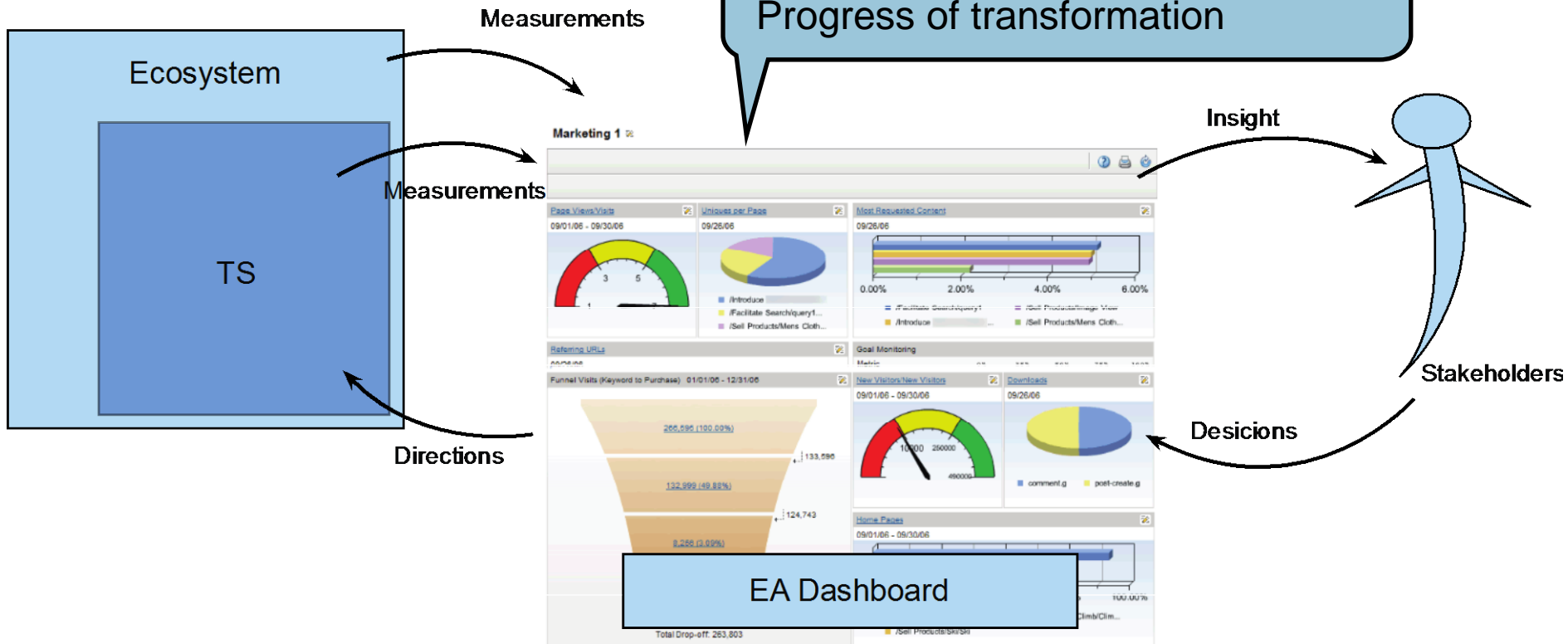
- Those properties of an enterprise that are necessary and sufficient to meet its essential requirements
- Can be used for:
 - Past
 - Present
 - Future

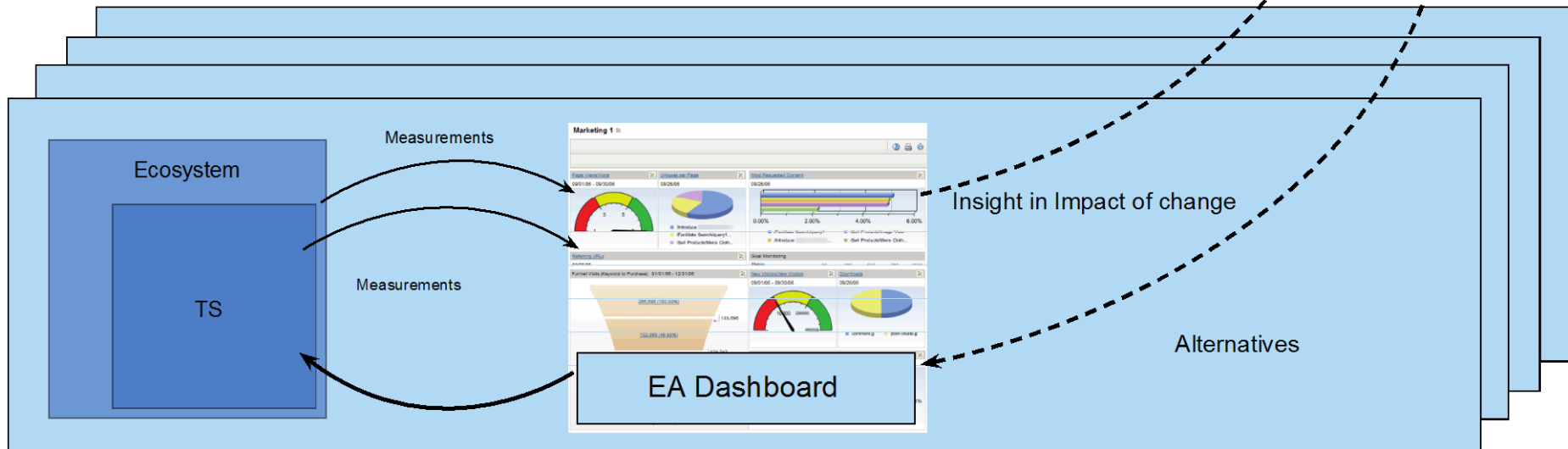
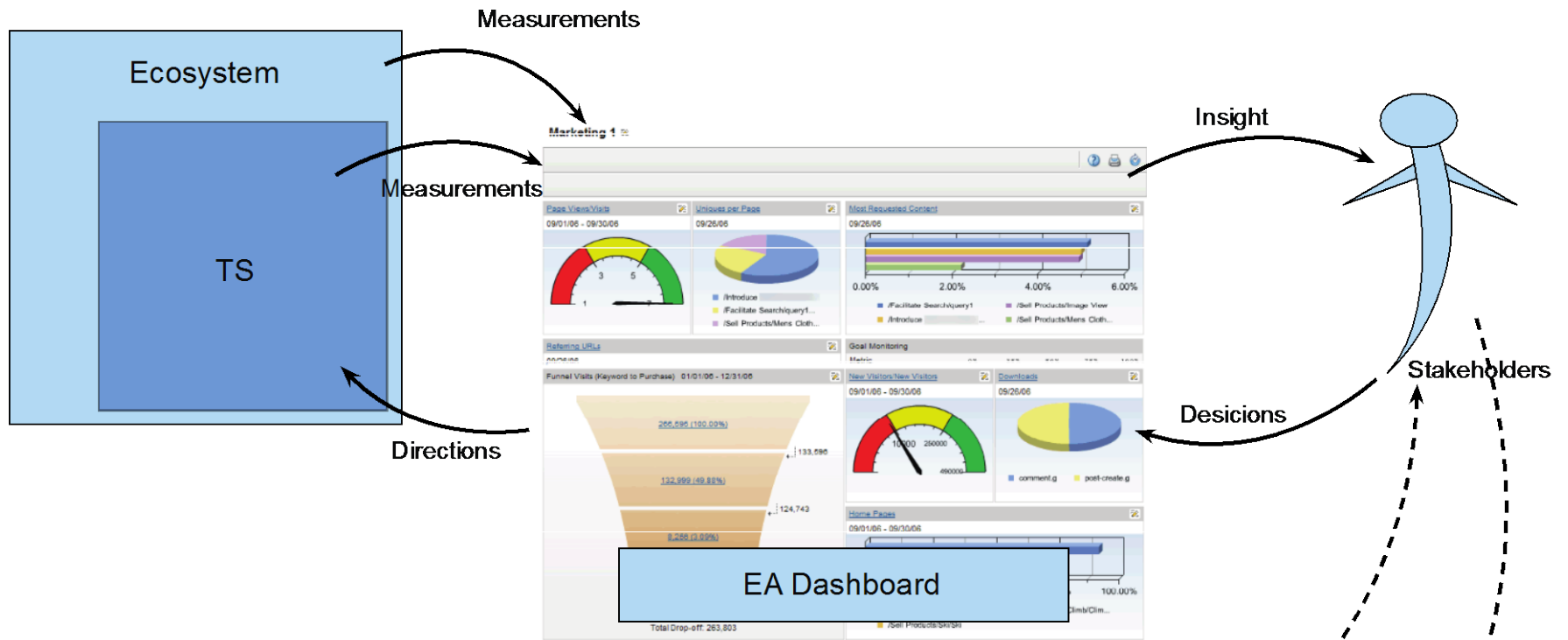


Steering?



Performance of operational enterprise
Base-line and target architectures
Progress of transformation





Role of EA

- Different levels of granularity
 - City plan *Enterprise-wide*
 - District plan *Business unit*
 - Building Designing *Business service*
- Align different aspects of the enterprise:
 - Business, information, technologies, ...

Enterprise architecture for steering

Purpose:

Steer enterprise transformation

Meaning:

Sensemaking of past / present / future

Restriction of design freedom for future

Elements:

Requirements, principles & building blocks

Typical ingredients of EA

- Connection to the strategic level
- Enterprise architecture elements



Core elements of EA

- Frameworks:
 - Governance & design domains
- From why to how:
 - Requirements, principles, instructions
- Communication:
 - Views

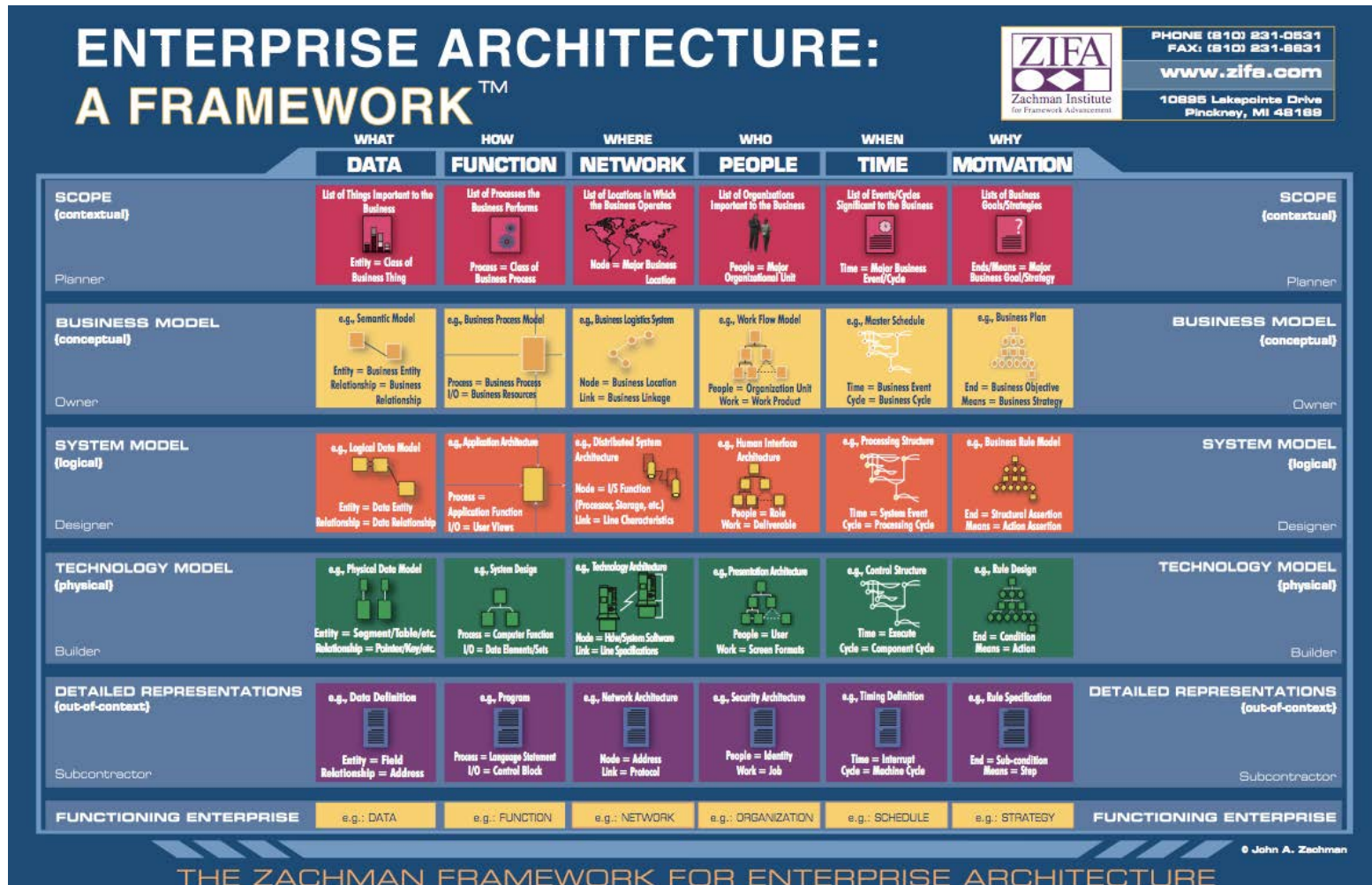
Frameworks

- Positioning of architecture content
- The “stuff” we need to talk, decide & negotiate about
- Two levels of frameworks:
 - Governance domains
 - Design domains

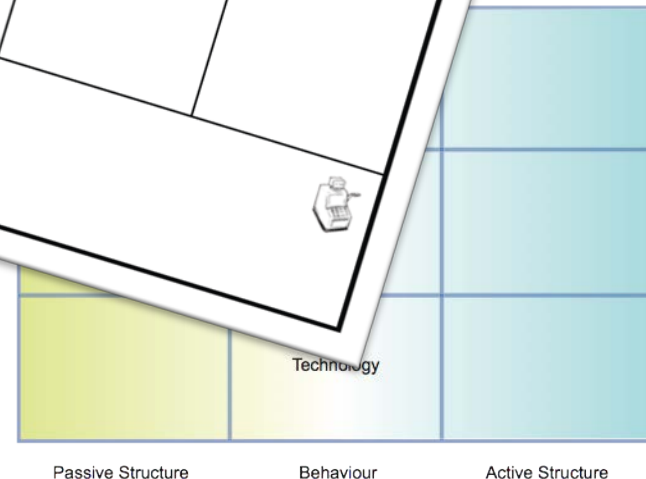
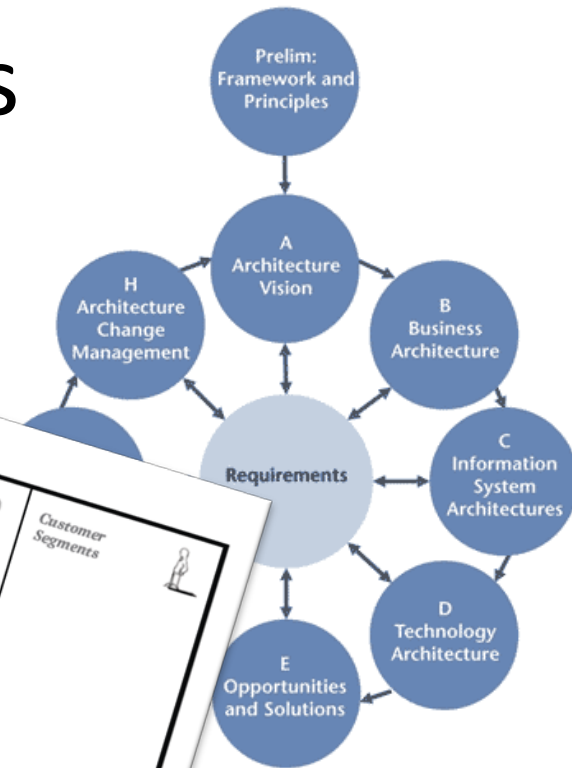
Design domains

- What domains to consider?
- Depends on one's *Design philosophy*
- Examples:
 - Functional vs constructional
 - Essential vs implementation
 - Business, information, data

Design domains



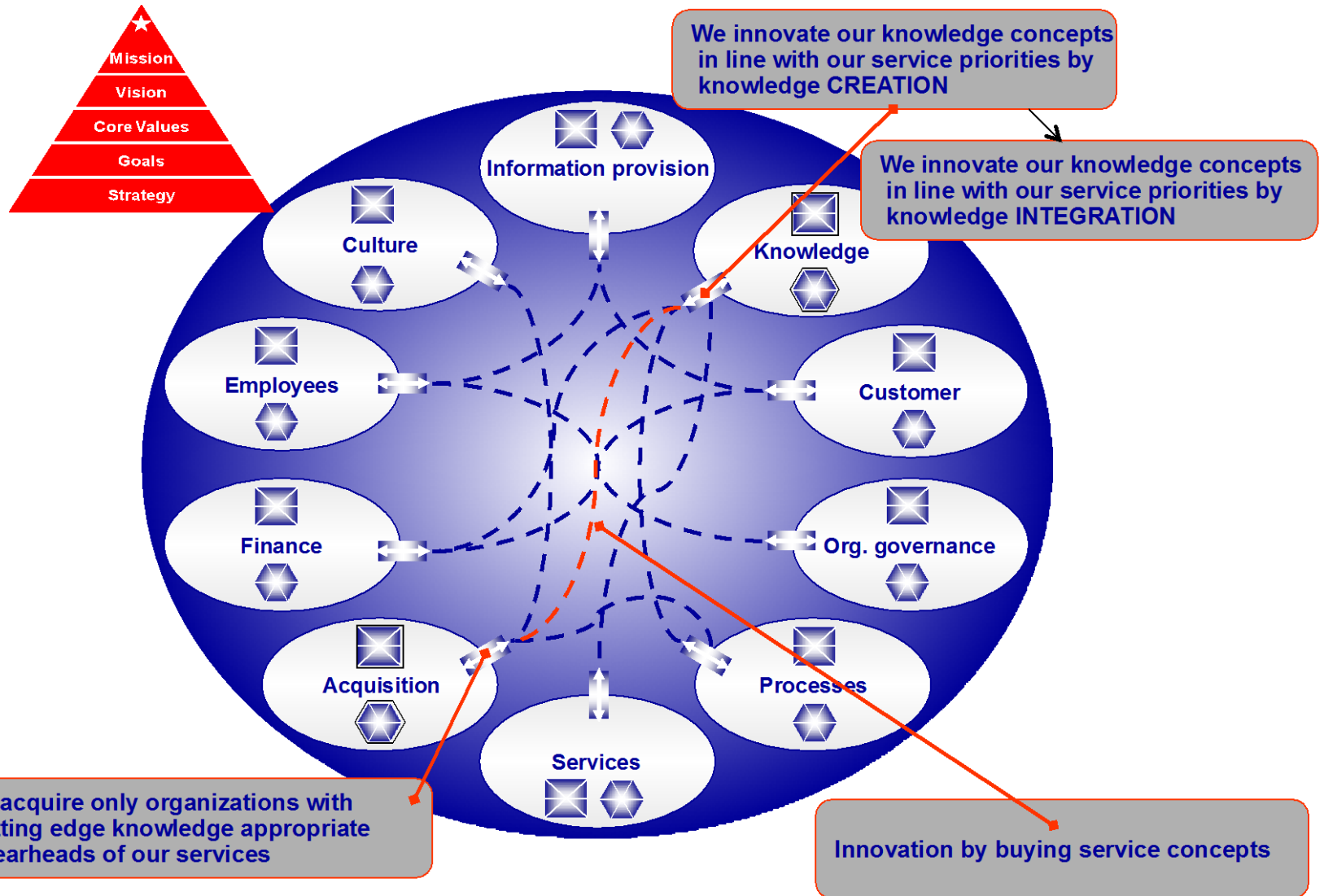
More frameworks



Governance domains

- Angles to govern transformations:
 - Business drivers / functions / ...
 - Social & political forces
- Culture, acquisition, finance, SCM, ...
- EA balances between these angles
- Organization specific!

Governance domains



Governance domains

- Discussions lead to shared understanding
- Negotiations lead to accepted solutions

Link to design domains

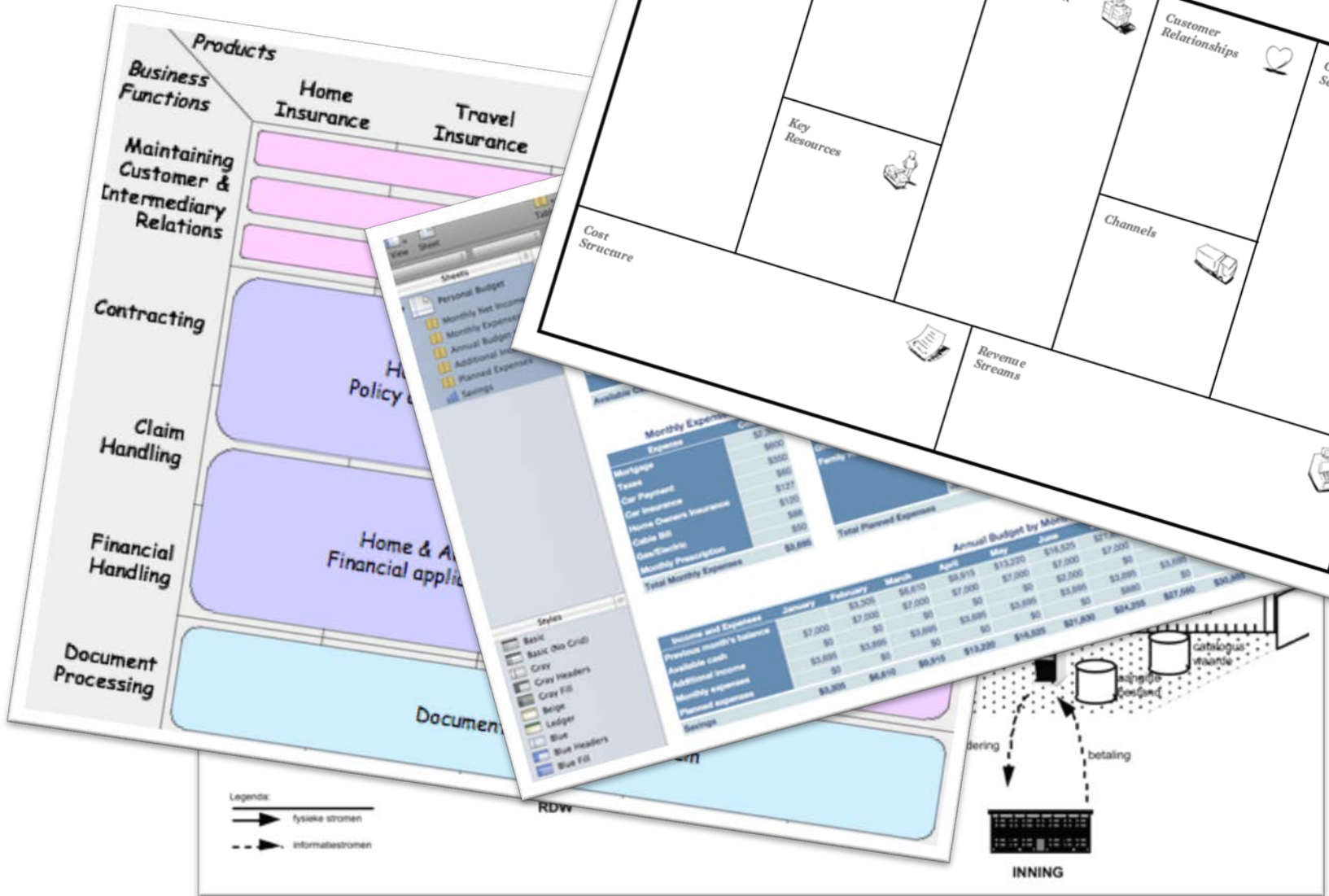
- The chosen design framework can be used to structure the discussions between the governance domains
- Design philosophy
- A common language!

Views

- Allow models to be tuned / focused to specific stakeholders and concerns
- Home in on specific aspects
- Use more suitable representation / media

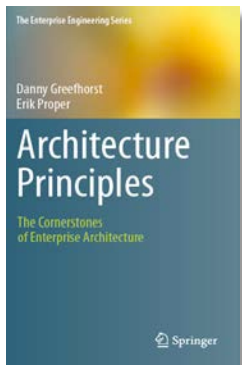


Views



Architecture requirements

- *Essential requirements on an enterprise*
- Architecture:
 - “those properties of an enterprise that are necessary and sufficient to meet its *essential requirements*”
- Essential from the governance domains
- Expressed in terms of stakeholder goals
- Consensus / balance needed
- Grounded in the enterprise’s strategy



Architecture principles

- *A declarative statement that normatively restricts design freedom*
- Considers the design space from a *constraining* perspective
- Validatable by stakeholders

Examples

We should follow citizen logic.

Applications should be decoupled.

The status of customer requests is readily available inside and outside the organization.

Communication between application services will take place via an enterprise-wide application service bus.

Credo

Norm

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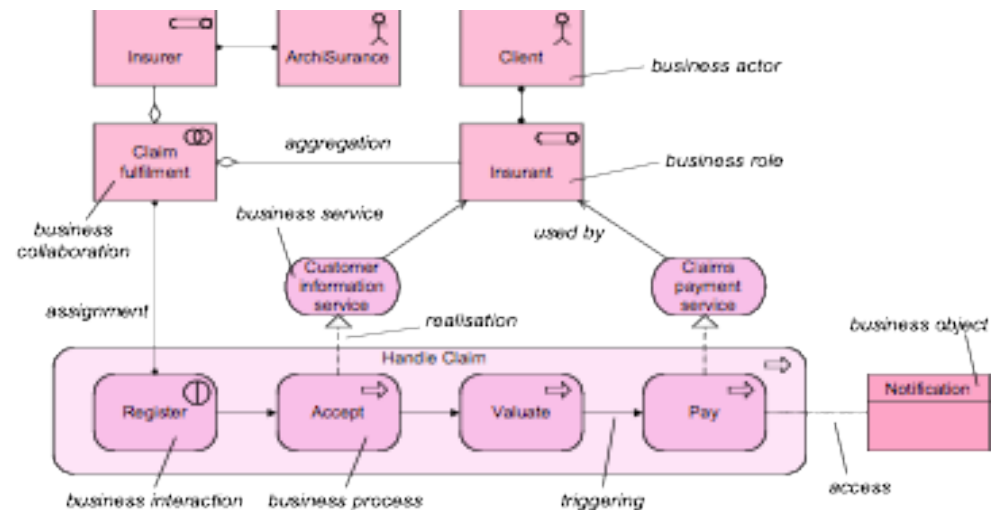
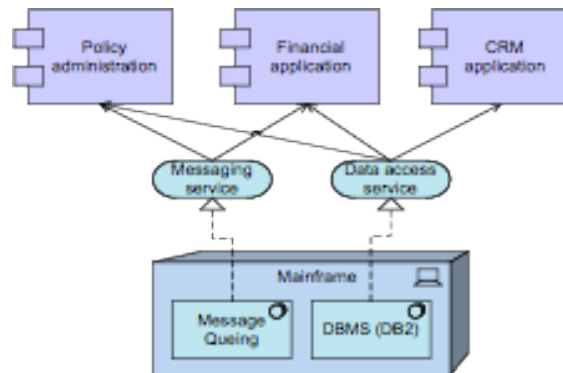
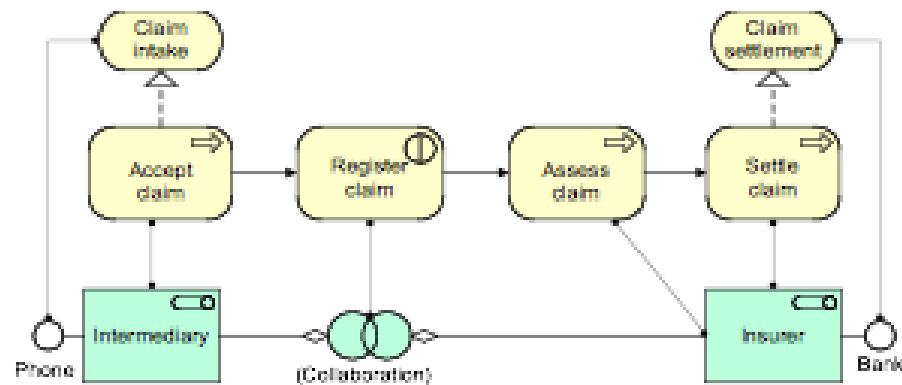
Implications:

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Architecture instructions

- *An instructive statement that describes the design of an artifact in terms of building blocks*
- Formulated from a constructing perspective
- Models of building blocks

Building blocks



When to stop architecting?

- Cut-off criterion:
 - Who wants to direct the enterprise transformation?
 - What are their concerns?
 - Enough insight provided?
 - Enough steering desires addressed?
 - Enough steering information towards design?

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What to architect?

- What to focus on in an architecture?
- The “running” business?
- Or the ability to stage innovations?

Discipline of market leaders

- Treacy & Wiersema:
 - operational excellence
 - product leadership
 - client intimacy
- Where to focus an architecting effort on?

Enterprise capabilities

Stable patterns of collective activity in an enterprise

Supported/enabled by resources:

- Social
- Technological
- Economical
- ...

Operational capabilities

Enterprise capabilities pertaining to an enterprise's operational activities

Includes execution, support & management

Enterprise transformation

Transformation of an enterprise's capabilities and/or the resources supporting/enabling these capabilities

Transformation capabilities

Enterprise capabilities needed to transform enterprise capabilities

Includes execution, support & management of the transformation

Dynamic capability

Transformation capability at a level that enables the rapid transformation of enterprise capabilities to address environmental changes

“the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.”

David J. Teece, Gary Pisano, and Amy Shuen

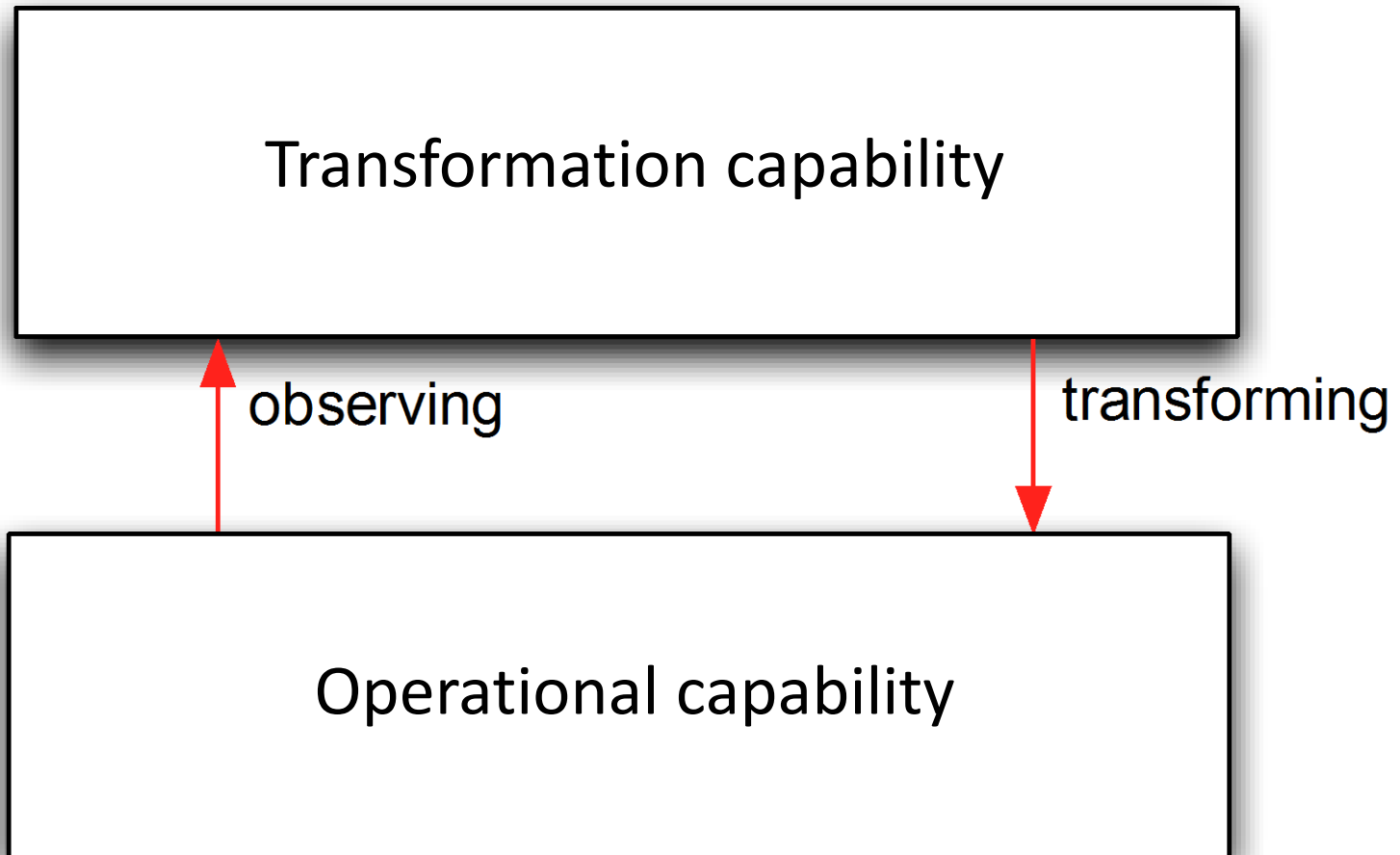
Aspect systems

- Operational and transformation capability are aspect-systems and not sub-systems
- One actor typically plays multiple roles

Dimensions for transformation initiation

- Location
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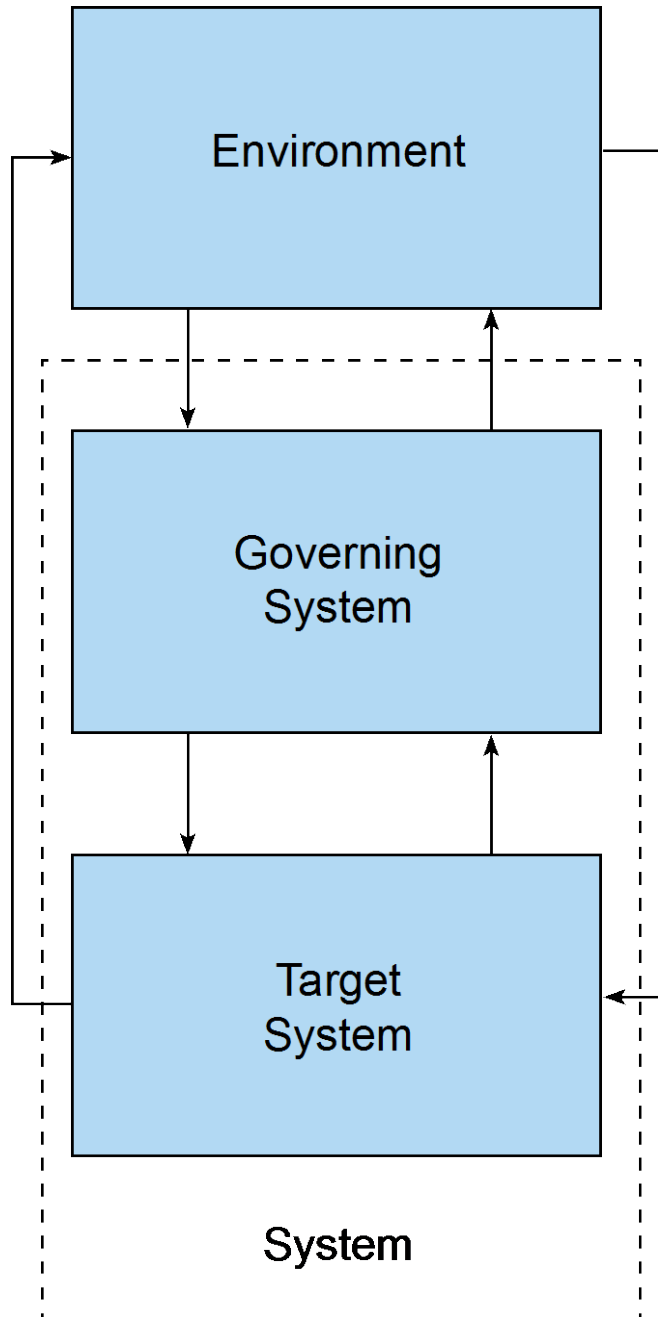
Connection between aspects



Architecting the transformation capability

- What goes on in the transformation capability?
- A conceptual architecture
- What building blocks are needed?

Control paradigm

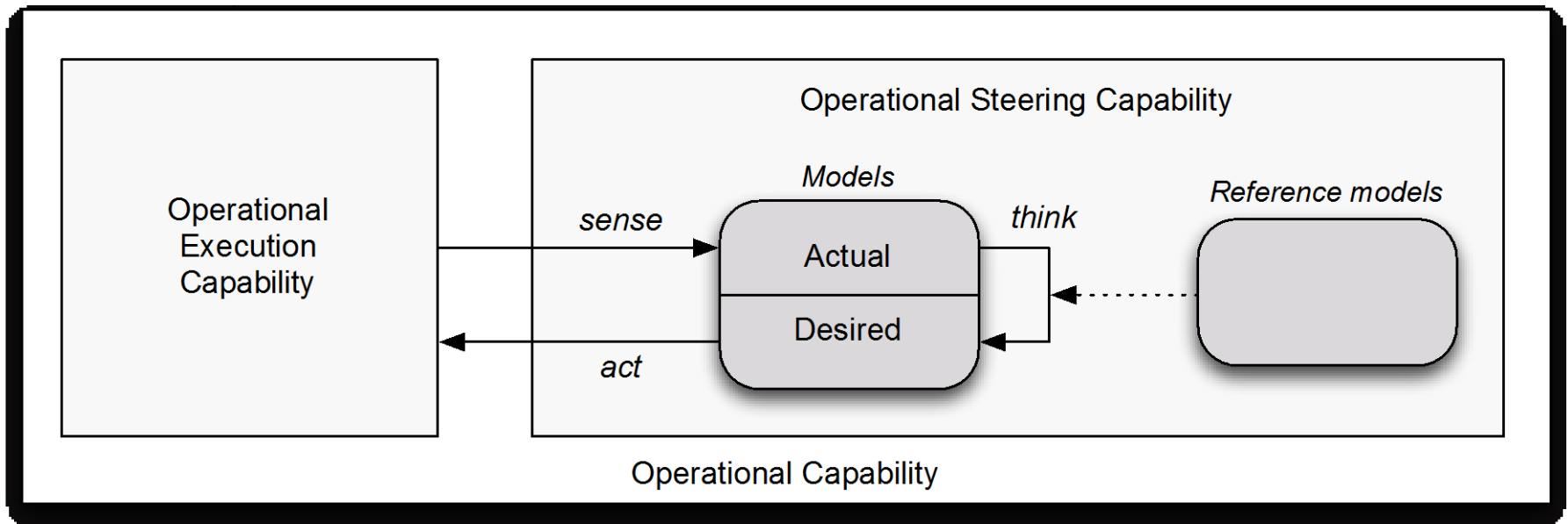


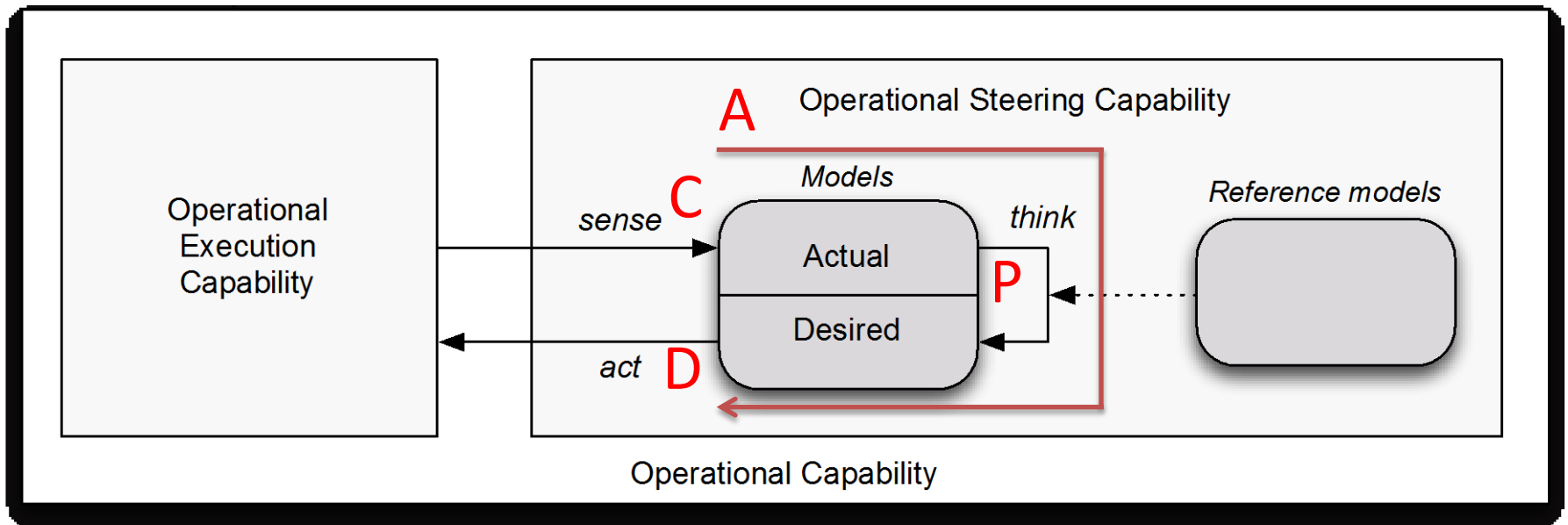
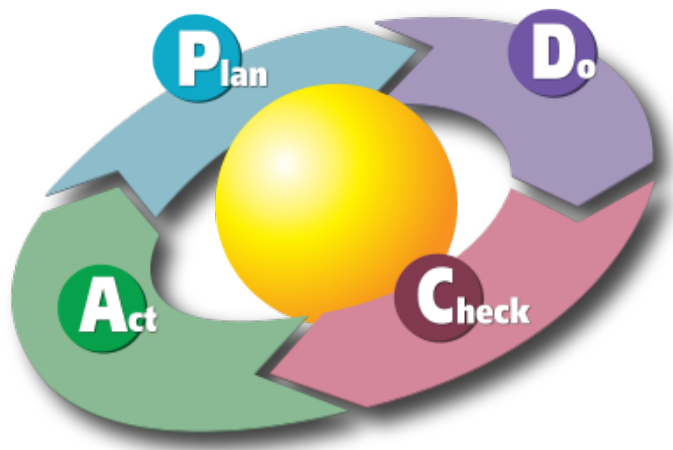
Sense-Think-Act

- Application of control paradigm
- Originates from robotics
- When applied in enterprises ...

Sense-Think-Act

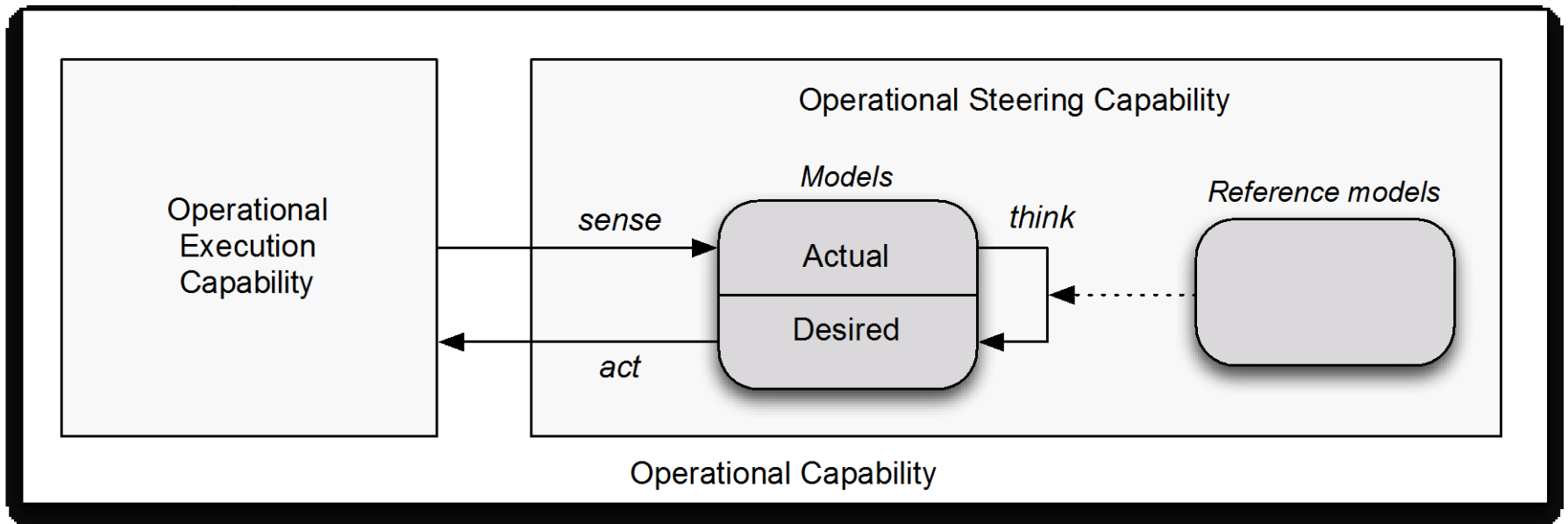
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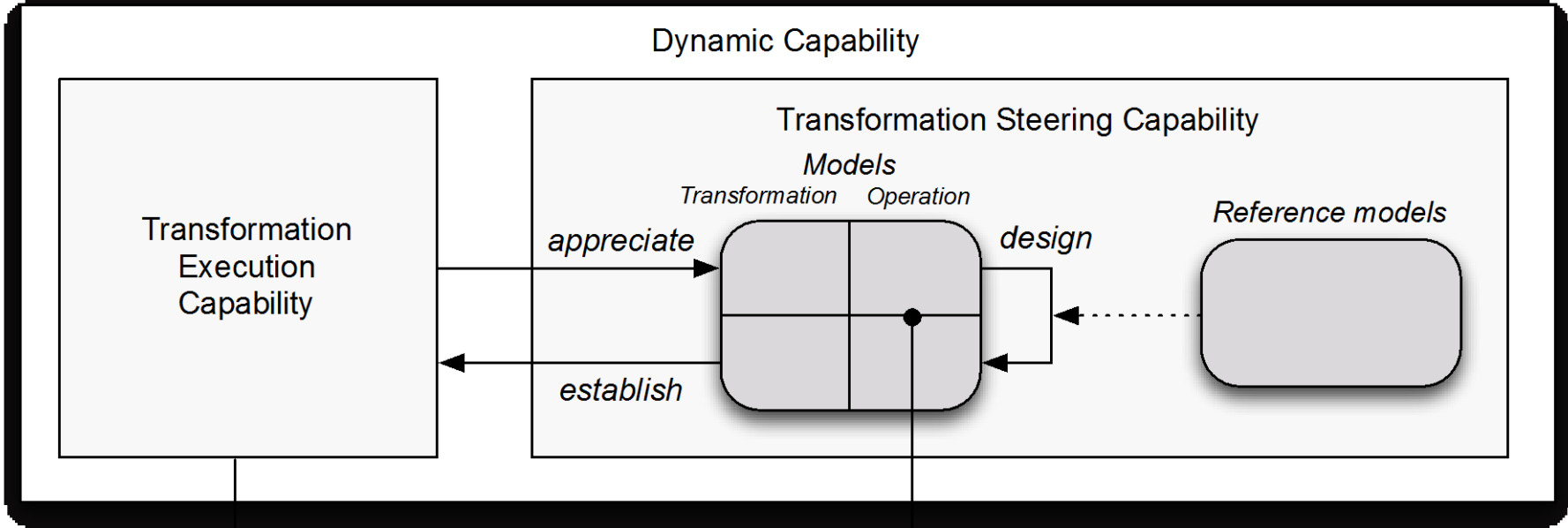




Enterprise Transformations

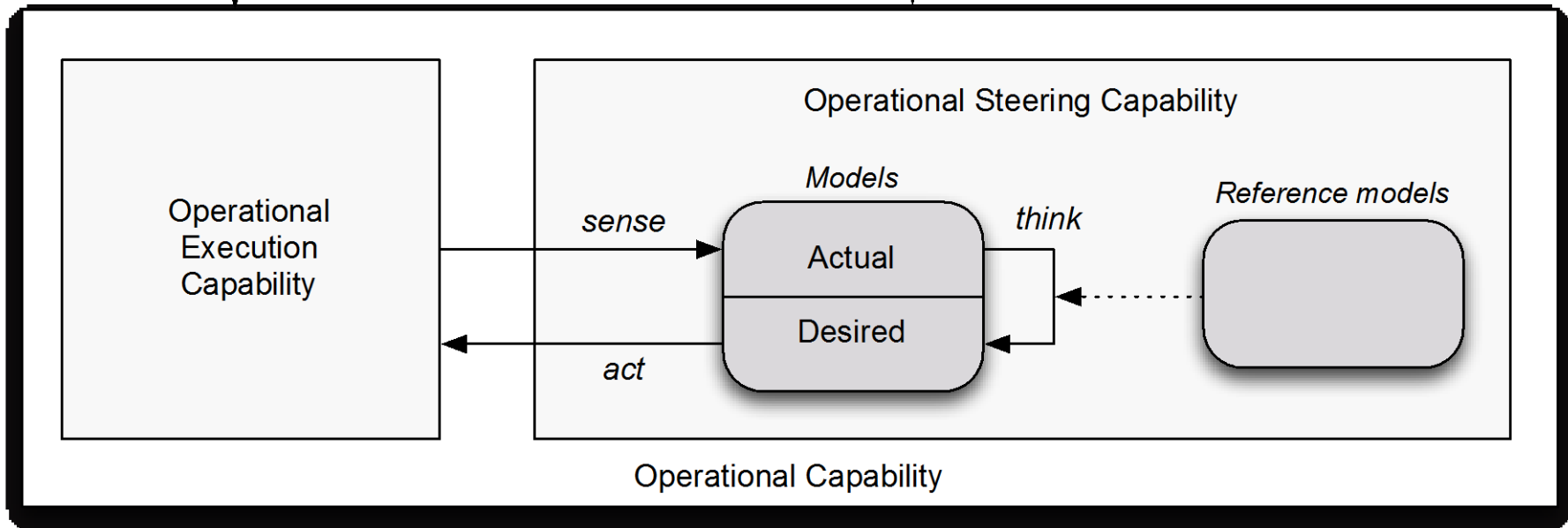
- A 2nd level of Sense-Think-Act
- Appreciate-Design-Establish





transforms

of (evolution of)



Needed building blocks – Appreciate

Logging & Mining:

- Enterprise and its environment
- Operations and transformations
- As-is-actual, As-was-planned and As-is-planned
- Sense-making from an enterprise ontological perspective
- Trajectory ... not just “state” oriented

Needed building blocks – Design & establish

- Design:
 - Collaborative design environments
 - Feed with sense(making) input
 - What-if analysis
- Establish:
 - Model-*enabled* execution of work
 - Model-*enabled* enterprises

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Thank you for your attention

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