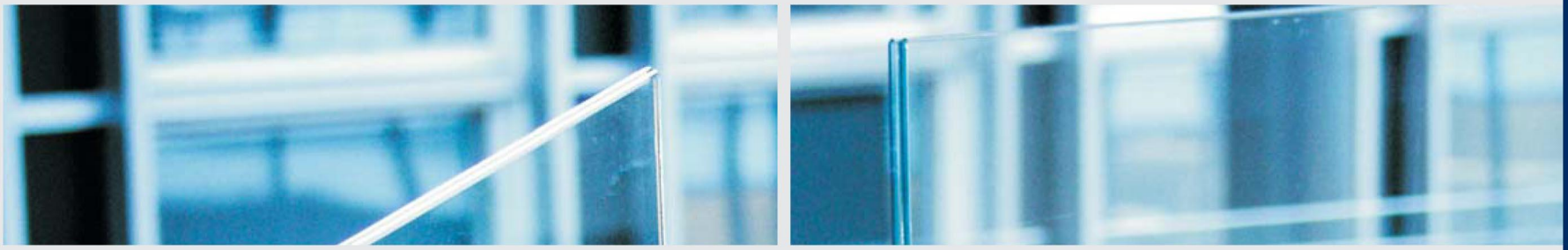
Analyzing the Command and Control Maturity levels of Collaborating Organizations



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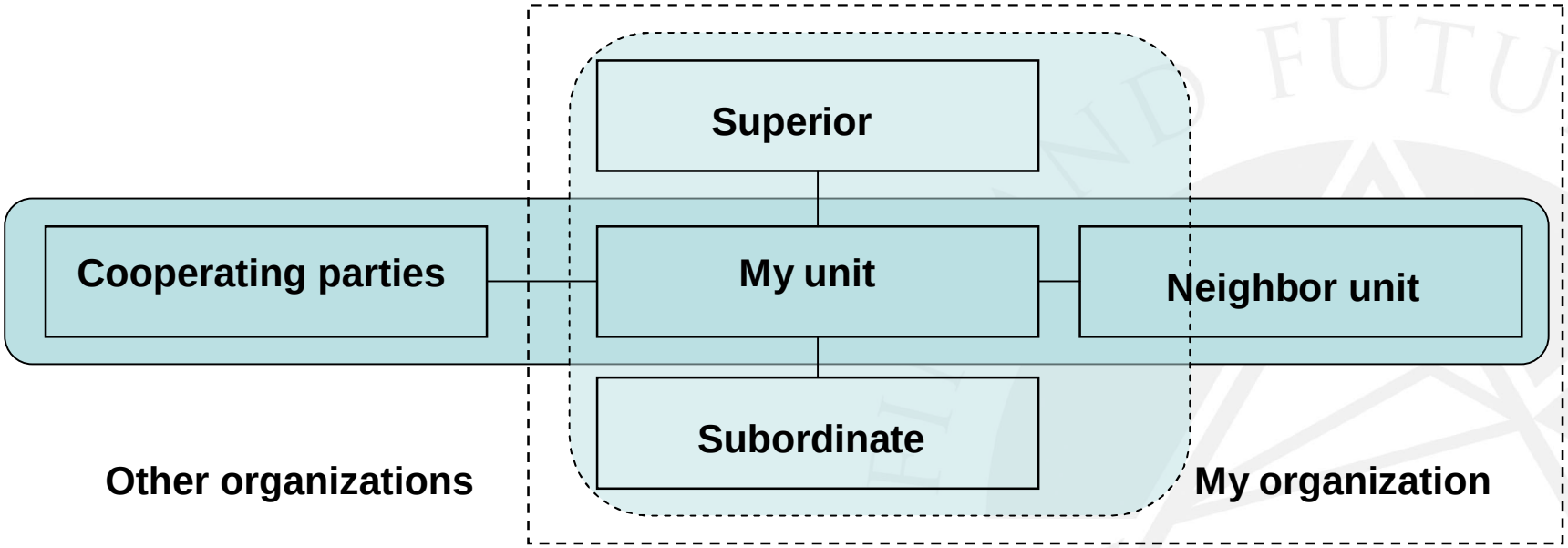
Motivation

- Organizational inter-dependency is increasing
- Demands for cross-organizational collaboration are increasing
- Collaboration maturity level measurement is required to develop tools and practices to ensure feasible cooperation between organizations in various cases
- Inter-organizational relationships are complex and emergent thus not controllable and practically very challenging to measure
- Methodology for fast or even on-line evaluation of collaborative situations to support system development and process adjustment is required

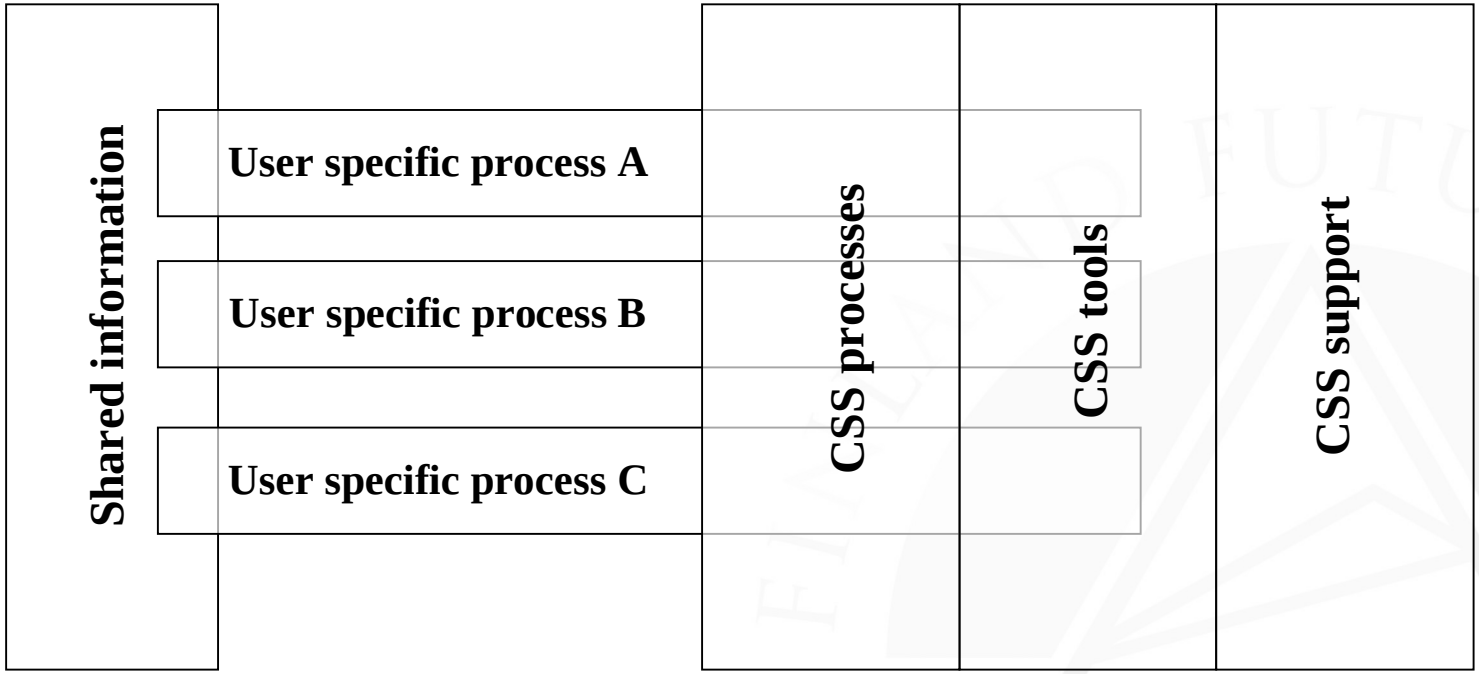
Collaboration Support System

- Generic CSS reference system is used
- CSS provides information releasing and exchange forum and collaboration toolset and user supporting processes for organizations that are working on the same operational area
- Horizontal – cross-organizational – collaboration situations are especially supported, but both inter-and intra-organizational aspects are taken account (see next slide)

Inter -and Intra organizational Collaboration



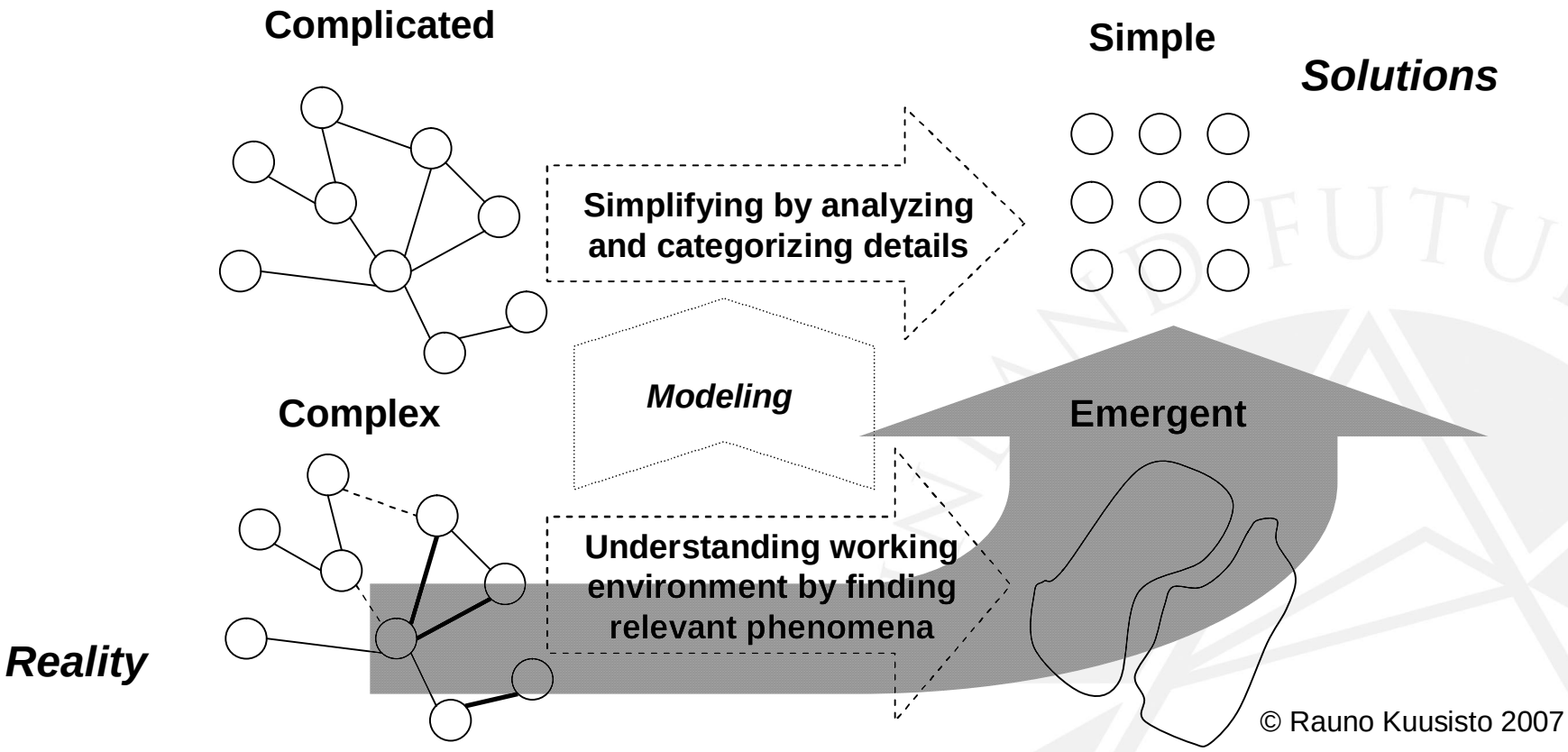
CSS Information Sharing Architecture



Methodological idea

- Basic idea is to tame fuzzyness of the complex collaboration situation both by making determined scientific models and finding out emerging phenomena of the information exchange practices of these situations
- This paper concentrates the latter one reaching to construct simple enough model to outline patterns to understand the information exchange dynamics of collaborative parties (see slide 7)
- Two models are connected:
  - NATO C2 Maturity model presented by Alberts and Hayes 2006 (slide 8)
  - Human information exchange framework by author from 2004 to 2008 (slide 9)
- Research strategy is as follows (slides 10 to 20):
  - Key word analysis is performed to apply the authors model into the NATO C2 maturity model
  - Real-life collaboration situations are observed to adjust the application
  - Adjustment and justification of modeling is performed
  - New collaboration maturity information exchange profiles are suggested

Analysis System from Reality to Solutions



Operational Maturity Levels

Agile

Collaborative

Coordinated

Deconfliceted

Conflicted

(Alberts & Hayes 2006, 85, Fig. 17)

Human Information Exchange Framework

Basic assumptions

Socially true values

Physically true values

Social artifacts

Physical artifacts

Mission, vision

Foreseen end states

Anticipated futures

Action patterns

Features

Decision

Alternatives

Possibilities

Restrictions

Event model

Task

Means

Resources

Environment

Events

NATO C2 Maturity model analysis

- Key expressions and words that defined the five various maturity levels (slide 11) were evaluated and situated into the human information exchange framework assuming that:
- Collaboration maturity level can be evaluated, if the types of discussed and released information is analyzed during the collaboration situation by key expression analysis. (slides 12 – 15)
- Information released:
  - Information is expressed publicly, but without interactivity
- Information discussed:
  - Actively exchanged in mutual interaction situation

C2 Maturity Model Key Expressions

- 1. *Conflicted*: Individual contributors, no information distribution, and no interaction.
- 2. *De-conflicted*: Avoidance of adverse cross-impacts, problem space, solution space, function of geography, capability and time, decision distribution, constraints, peer-to-peer interaction to resolve cross-impacts, creation of boundaries along time, space, function and echelon lines, identification of potential conflicts, resolution of conflicts and boundaries.
- 3. *Coordinated*: Increase effectiveness, intent, relationships between plans and actions, enhance effects, non-organic resources, quality of information, shared intent, linking actions and various plans, formal and informal interactions, distribution of decision rights, shared intent and linked plan, linking of plans and actions to generate synergy, reinforcing each others efforts, option space, task organizing, shared intent.
- 4. *Collaborative*: Significant synergy, shared plan, establishing roles, coupling actions, sharing of resources, shared awareness, single shared plan, shared intent, conflict, supporting plans, interdependent, multi-level interaction, information and cognitive domain, shared understanding, single plan, delegating rights, sharing of resources, shared plan, symbiotic relationship, expanded option space, parallel planning, trust, shared understanding, pooling the risk, task organization, objectives, space, time, function, holistic, shared intent, shared understanding, trust, integrated and synchronized plan, collaborative environment.
- 5. *Agile*: Seeing future together, self-synchronizing, seeing possibilities and restrictions together, dynamic, richly and extensively shared information, distributed decision rights, shared understanding, collective intent, optimizing resources, dynamic, uncertainty, complexity, development of shared understanding, awareness and intent, robust, secure, ubiquitous and interoperable information infrastructure.

De-conflicted (m/C2M)

Basic assumptions

Socially true values

Physically true values

Social artefacts

Physical artefacts

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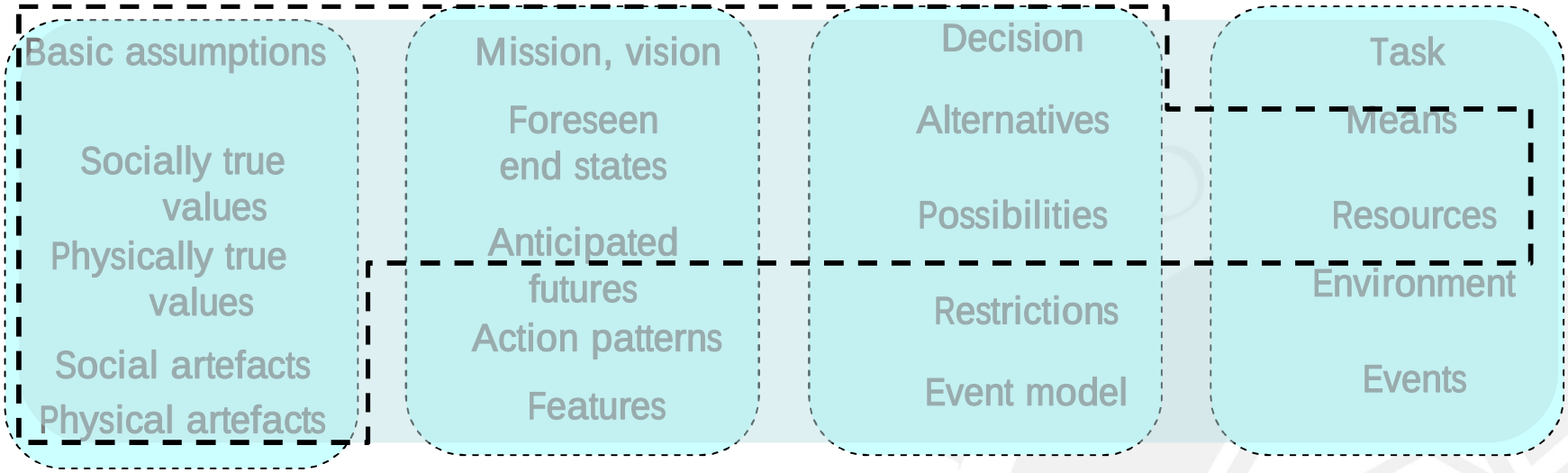
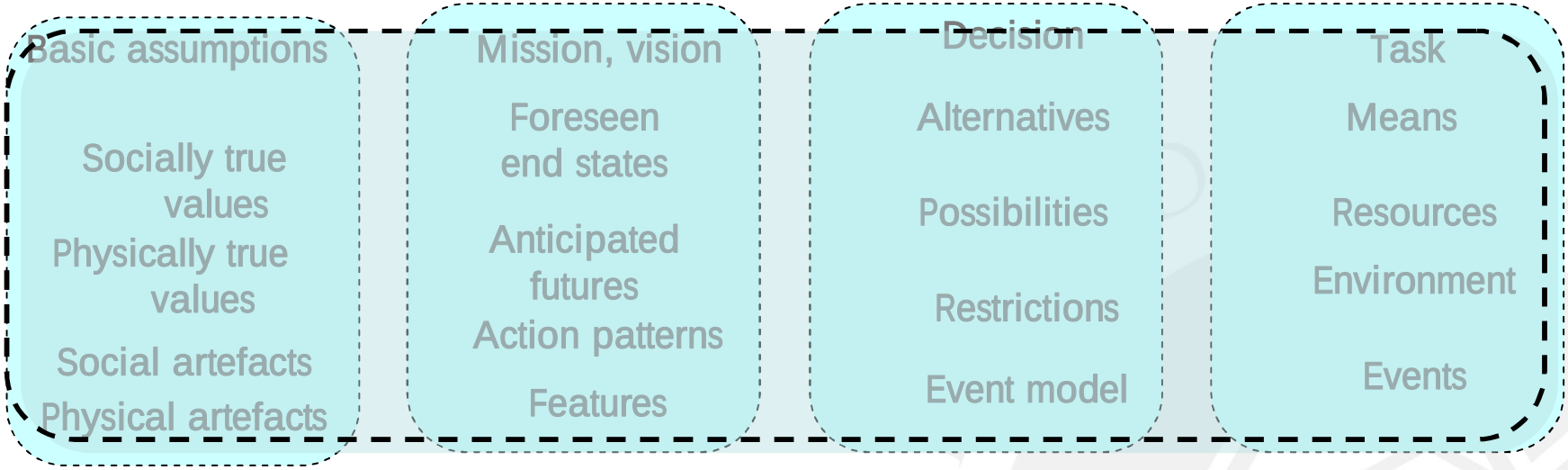
Collaborative (m/C2M)



Agile (m/C2M)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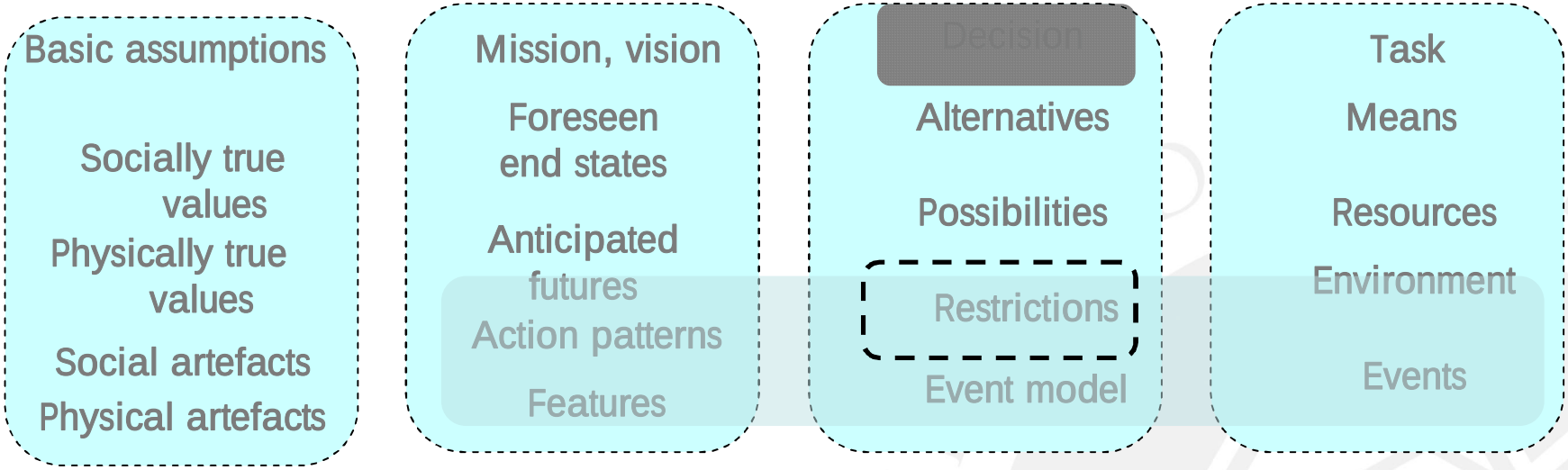
Empirical Testing

- Domestic inter-agency cooperation exercise was analyzed:
  - Tactical management rehearsing in collaborative environment
  - General briefings, decision discussion and free publication of information were analyzed
  - Discussions and unidirectional information release were analyzed separately
- Results were categorized on the basis of information exchange meta-model
- Results are interesting, but because it is question of developing methodology, those are skipped
- Slight changes compared to first hypothesis are suggested

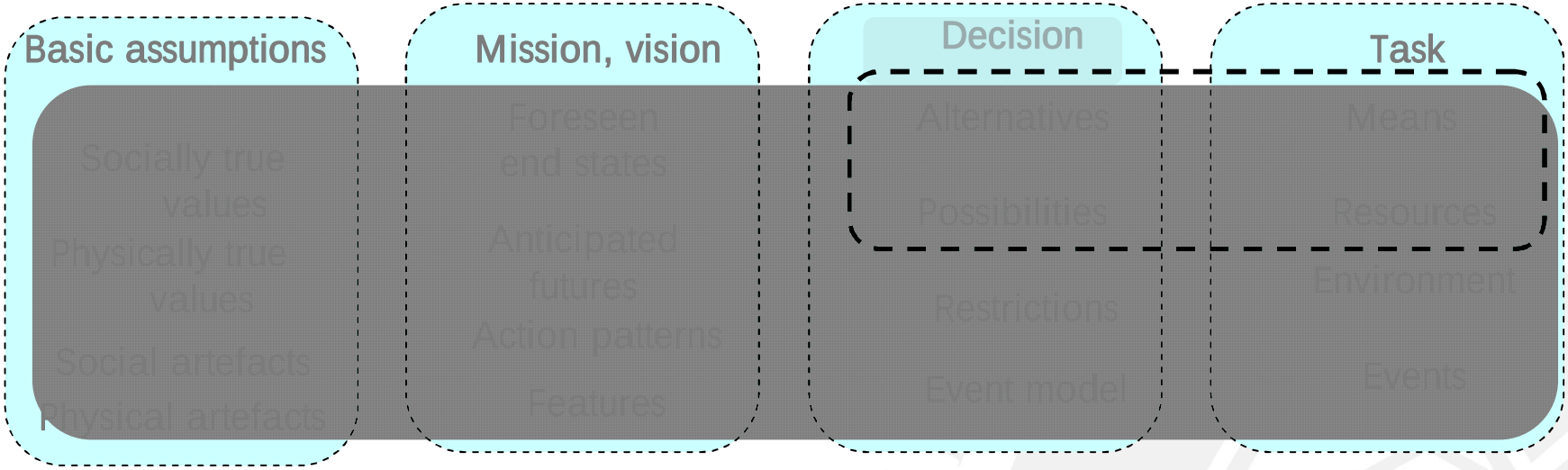
Conclusions

- The information exchange profiles of various maturity levels of collaboration were adjusted slightly because of the results of empirical testing (slides 18 to 20)
- Values information exchange could not be tested

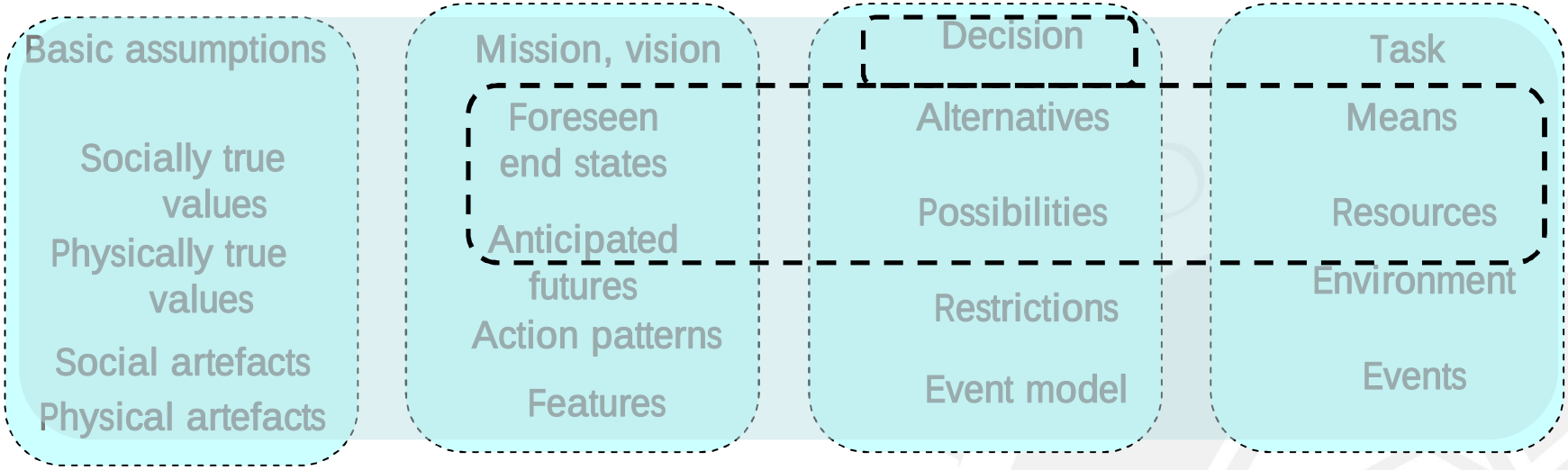
De-conflicted, mod.



Coordinated, mod.



Collaborative, mod.



Further work

- This methodology will be applied to evaluate collaboration maturity level development among CSS solution users during MNE5 **(were tested successfully spring 2008)**
- Methodology can be considered to be valid, when developing collaboration systems and processes **(preliminary results seem to support the validity of the methodology)**