Idioms for Collaborative Government Networks:
Conceptualization and Applications to Seamless Services

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Outline

1	Motivation	Importance of Collaborative Networks in Government
2	Objectives	Understanding CNO-Gs in the large
3	Approach	ARCON as basis for shared understanding of CNO-Gs?
4	Modeling	ARCON-based modeling for seamless service delivery
5	Observations	Validating ARCON in EGOV domain
6	Conclusion	Future work

Collaborative Government Networks (CNO-G)

Why is CNO in Government (CNO-G) so important?

1. Addressing the un-foreseen negative side effects of New Public Management programs:
   - so-called “pillarization” of the public sector
   - Excessive focus on performance management of individual organizations
   - single-purpose organization orientation
   - structural devolution with adequate supporting mechanisms

2. Responding to the need for information sharing in an increasingly complex world to support:
   - seamless and increasingly personalized service delivery
   - integrated policy development
   - security risks management
   - crisis and disaster preparedness and management

Some CNO-G Paradigms

A number of related paradigms (seeking similar outcomes) have emerged to respond to the need for different forms of collaboration networks in Government, including:

1)Collaborative Public Management - facilitating and operating in multi-organizational arrangements to solve problems that cannot be easily handled by single organizations.

2)Whole-of-Government Approach – use of coordination and integration to address fragmentations resulting from NPM optimizing strategies [Christensen et al '07].

3)Seamless and Joined-up government - attributable to Blair's government in 1997, to address complex issues crossing the boundaries of public organizations, levels of governments and policy areas [Christensen et al '07].

4)Partnerships - collaboration between government with private (Public-Private - PPP) sectors and other major actors (Multi-stakeholder - MSP) to better (feasibility, efficiency etc.) address specific problems.

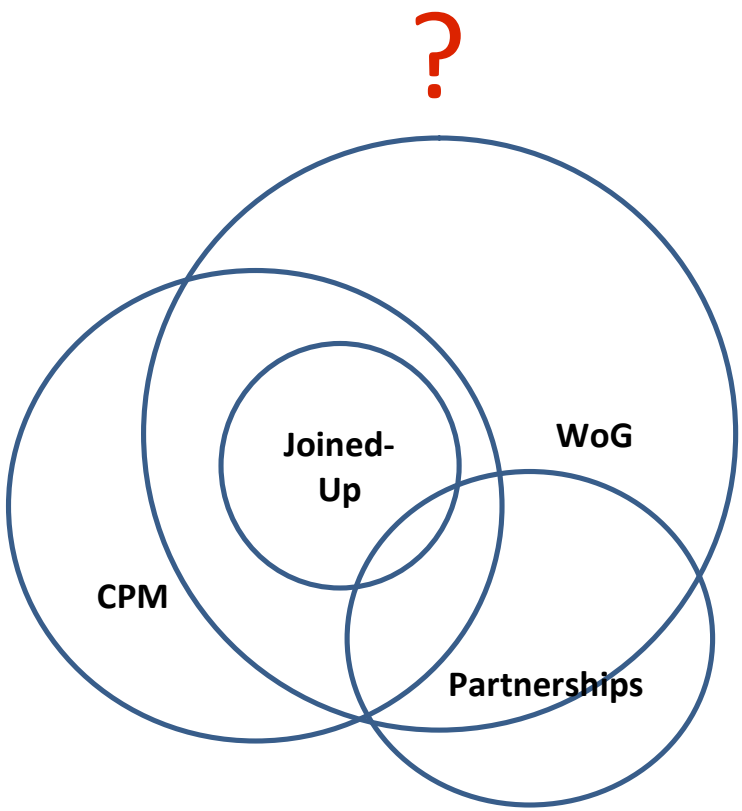
Understanding CNO-G Paradigms - Issues

Current Situation:

- Several proposed models based on paradigms in literature and practice
- Little or no information on the effectiveness of these models, except for occasional case studies
- Virtually no rigorous comparative analysis of these paradigms to guide adoption by governments
- Governments follow “best” or “good” practices from other governments

Problem:

Paucity of facts to guide the characterization, selection, integration, improvements and evolution of these paradigms



Can modeling help? How?

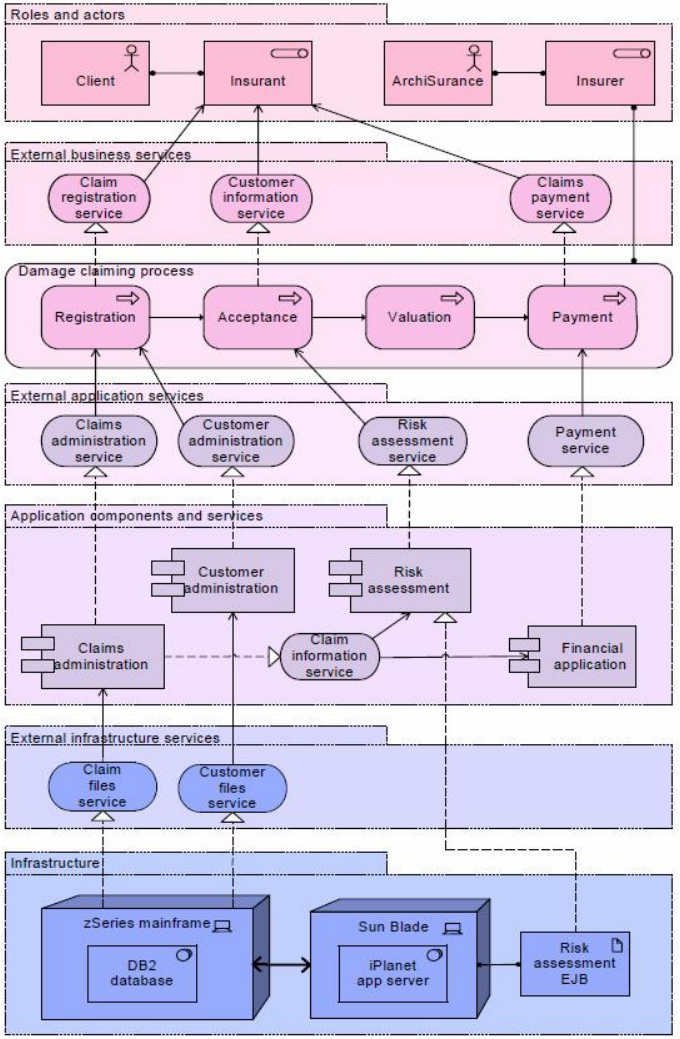
Modeling in CNO-G: Architecting GOV Enterprises

Government EA Modeling goals include:

- Ensure coherence among government organizations to enable a single or one-government view
- Support optimal use of technological and other resources across government
- Increase agility of government organizations individually and as a whole in responding to environmental changes

Modeling framework covers:

Organizational, Business, Information, Services and Technology aspects



Example of an Integrated EA

[Lankhost et al., 2004]

Knowledge Gap

Why is EA or related existing organizational modeling framework inadequate for CNO-G?

The model details "*how*" different elements of collaboration and the collaboration entities are linked to achieve collaboration goals.

For instance, we can describe or model how a one-stop service will provided jointly delivered through business processes contributed by several government agencies and supported by shared databases, services and infrastructure.

However, with these modeling frameworks , we are not able to tell, for instance:

- how a CNO-G for delivering seamless services is different from a CNO-G to support policy integration, or
- If a policy integration CNO-G could be transformed to an emergency support CNO-G?

The big picture in understanding the nature and forms of CNO-G is missing!

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Our Objectives

1) Identify a sufficiently “high-level” modeling framework that allows us to describe collaboration networked organizations in government (CNO-G)

2) Determine major constructs for a typical CNO-G based on the various CNO-G paradigms

3) Use these domain constructs as “idioms” for the more general modeling framework (mapping domain idioms to modeling framework)

4) Model a specific CNO-G type (for instance seamless service delivery) using the domain idioms and corresponding elements in the modeling framework

5) Analyze resulting models to better understand the CNO-G forms, validate selected modeling framework and provide feedback for refinement if necessary

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Approach

Selected Modeling Framework	ARCON – A Reference Model for Collaborative Networks ○provides generic abstraction for representing and understanding CNOs ○supports modeling the internals and external aspects of CNO-G, allowing explicit separation of spaces is useful for modeling CNO-G in e-government and e-governance contexts ○supports the modeling at three levels of abstraction – general representation, specific modeling and implementation modeling ○supports modeling at different stages of CNO life-cycle [Camarinha-Matos & Afsarmanesh '06]
CNO-G Type	Seamless Service Delivery in Government Concrete instance - Business License Applications
Modeling	Modeling done at the three levels CNO-G levels – general representation, specific modeling and implementation levels. Modeling notation is UML.
Validation	Can ARCON sufficiently describe Seamless Service Delivery?

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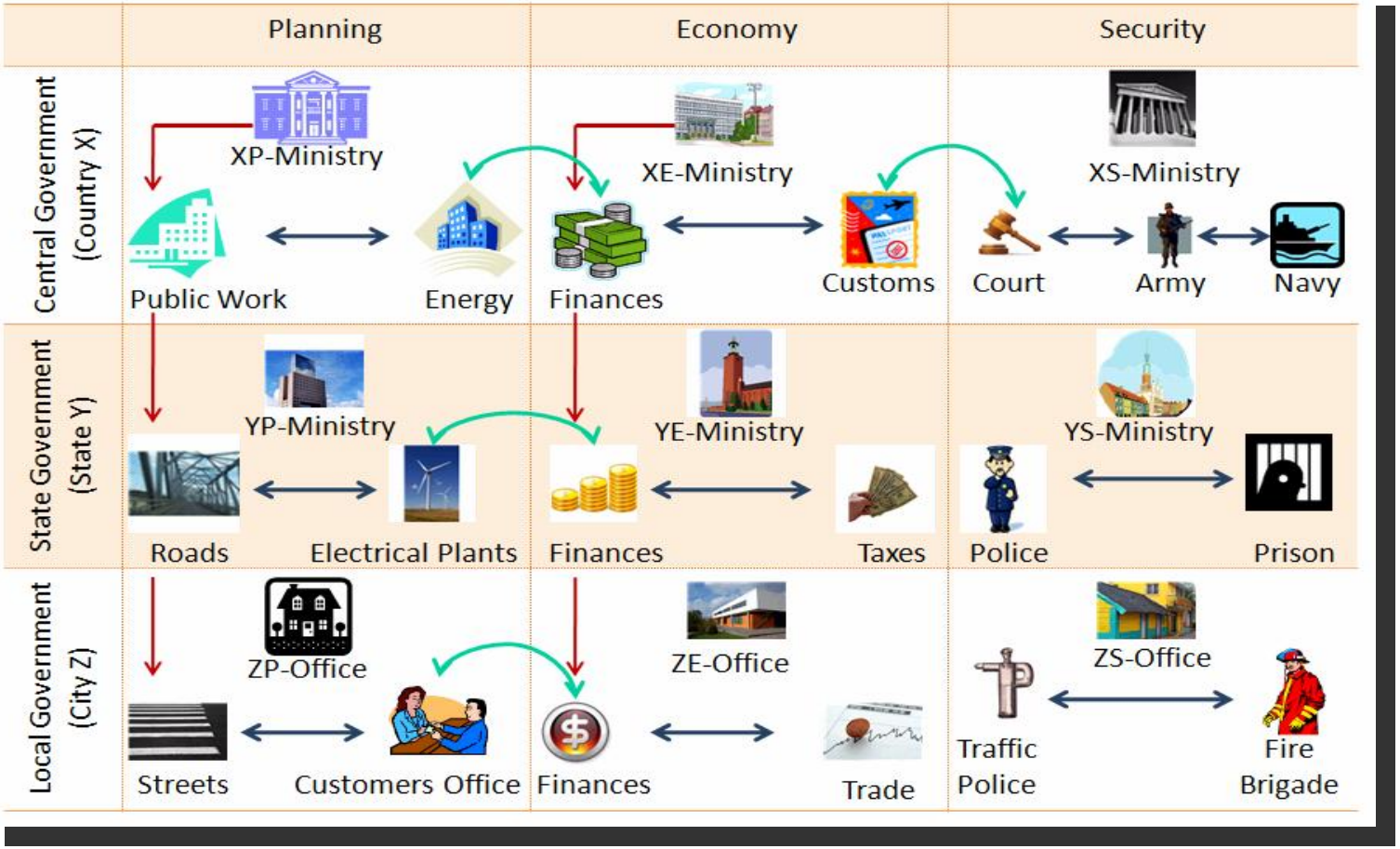
Definition – Core Concepts

Idioms	A "recurring" pattern expressed in a specific language. For instance, "coordination" could be described as pattern/constructs associated with collaborative networks in government (CNO-G) - an idiom.
Reference Model	A generic abstract representation for understanding the entities and the significant relationship among those entities of some areas. It also serves as basis for the derivation of other specific modeling for particular cases in that area [Camarinha-Matos & Afsarmanesh '06].
CNO-G	A collaborative network (CN) is a network consisting of a variety of entities (e.g. organizations, people, and even machines) that are largely autonomous, geographically distributed, and heterogeneous in terms of their operating environment, culture, social capital and goals, but collaborate to better achieve common or compatible goals, and whose interactions are supported by computer networks [Camarinha-Matos & Afsarmanesh, 2005]. A CN requiring organizational mechanism for its activities, it is called a Collaborative Network Organization (CNO).
Model	An abstraction of an entity or a system in a particular world.

Context for CNO-G

CNO-G are usually formed across organizational boundaries, sectoral boundaries and across levels of government.



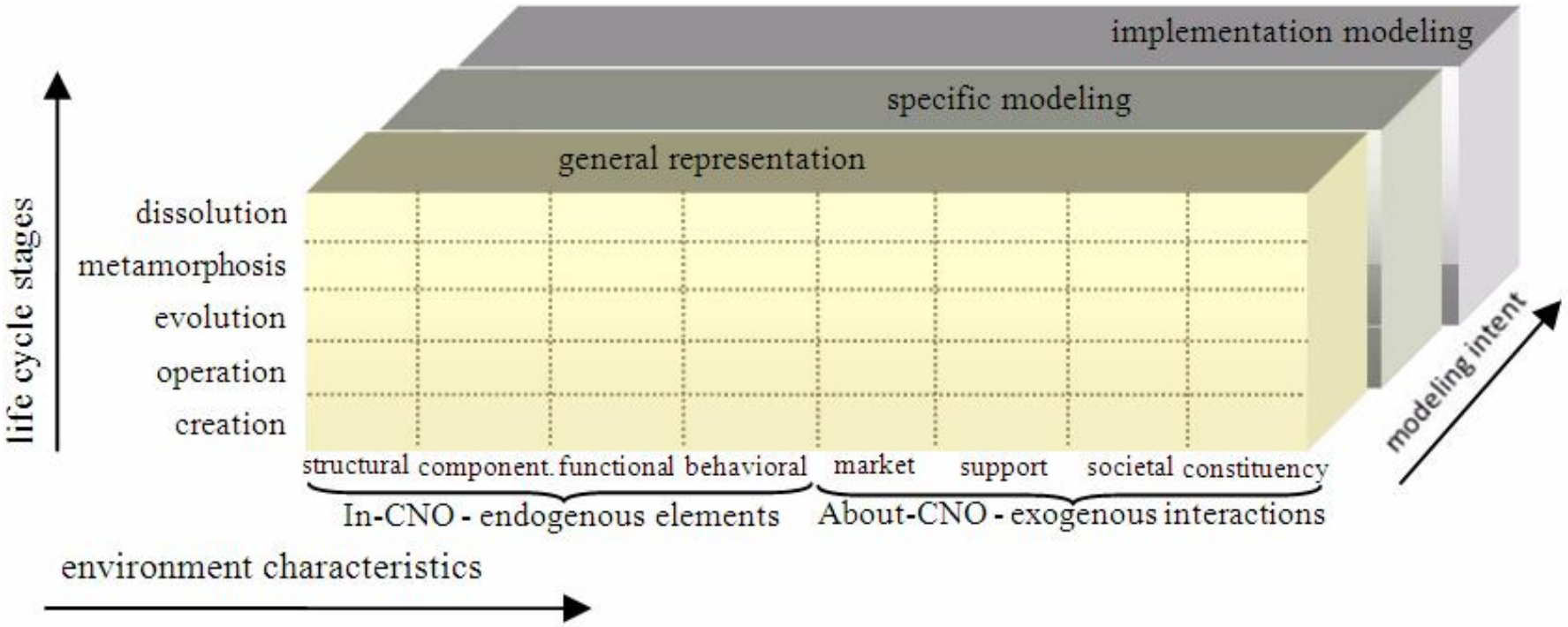
Eliciting Domain Constructs for CNO-G

Core domain constructs for CNO-G is obtained as the greatest common denominator of the inherent elements of the different CNO-G forms:

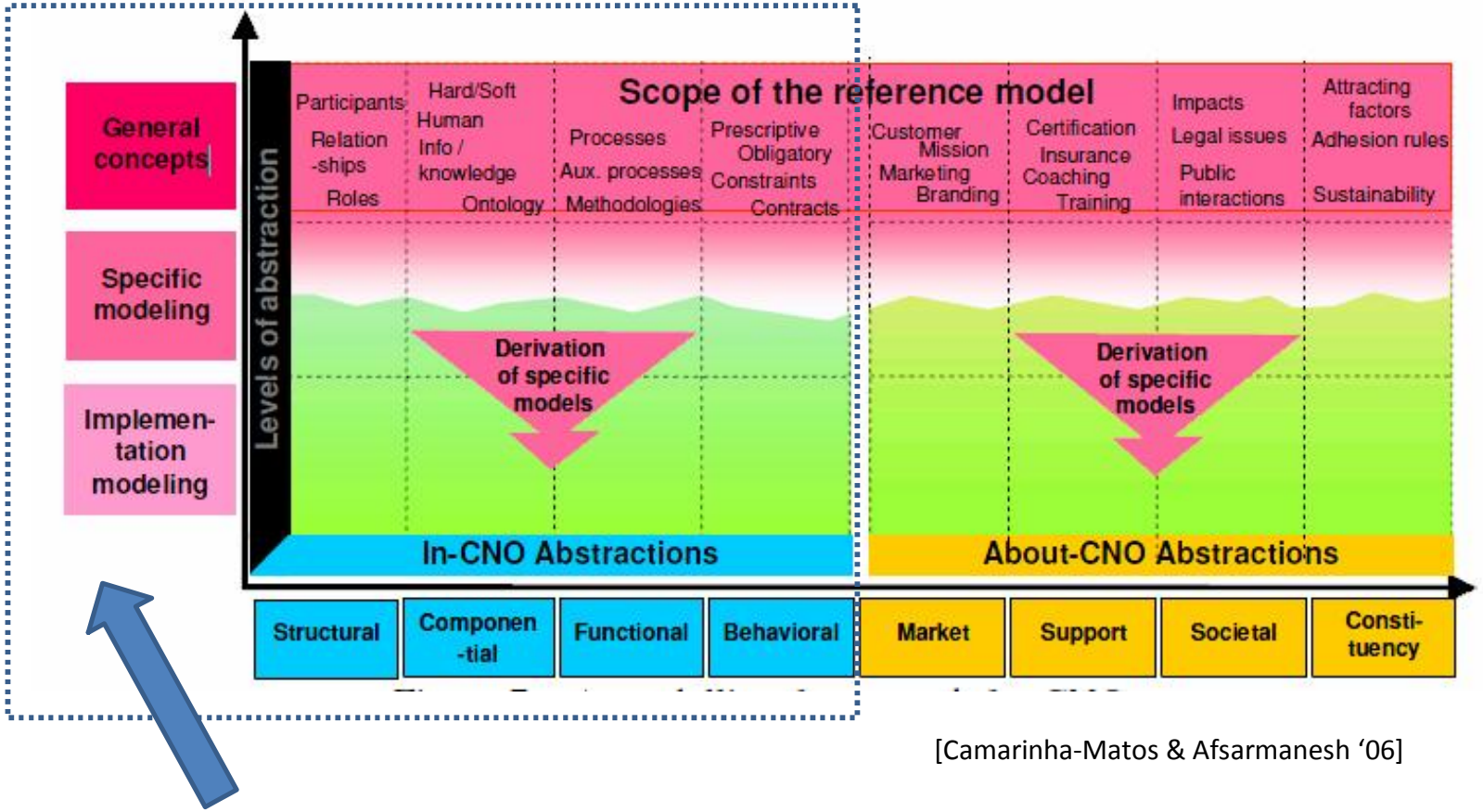
1) Collaborative Public Management
2) Whole of Government Approach
3) Joint and seamless government
4) Partnership – PPP & MSP

Partnership	Involves a set of actors with specific roles and responsibilities
Integration	Creating aggregate functions, processes and resources from individual function, processes and resources towards collaboration goals
Coordination	To ensure that networks functional and organization resources create the maximum value. Mechanisms include: providing context for action; providing advice and information to support action; authorization or direct supervision over action [Jones et. al, 2001].

ARCON Elements 1



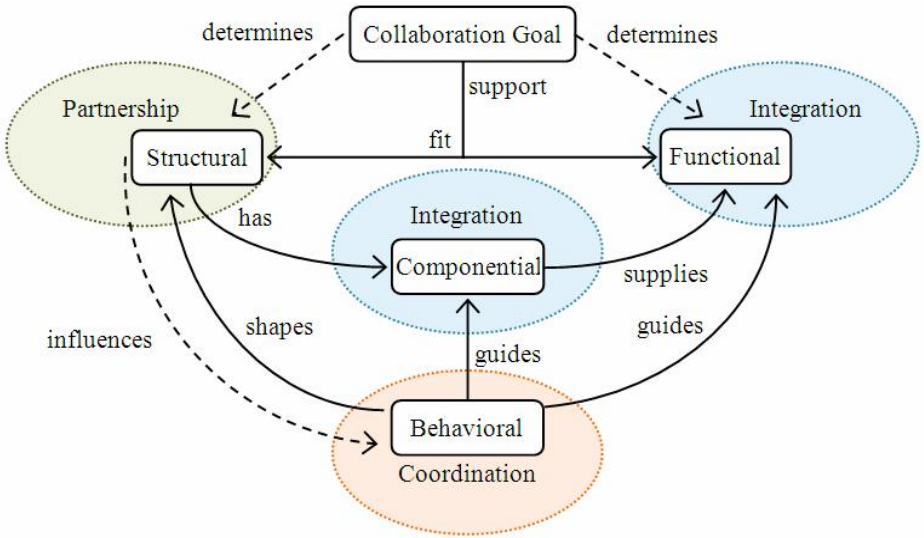
ARCON – “In CNO” Perspective



[Camarinha-Matos & Afsarmanesh ‘06]

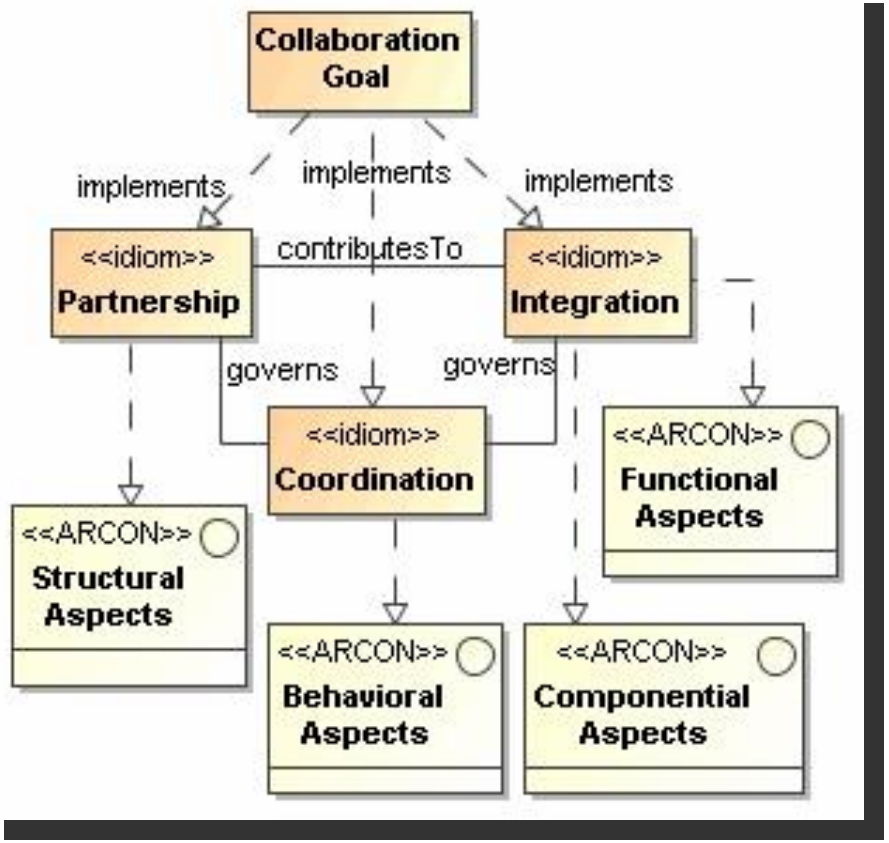
Focus is on the internals of the CNO-G
(E-Government Perspective)

Domain Constructs as ARCON Idioms



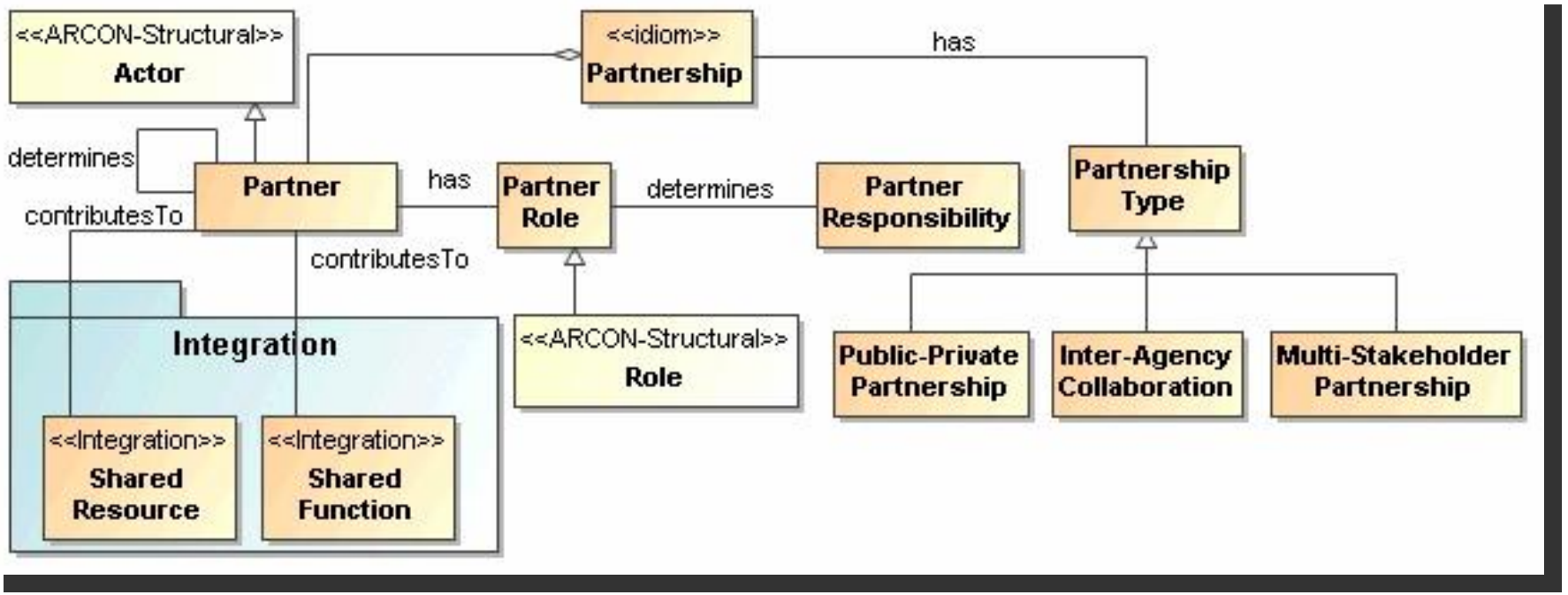
Mapping domain constructs to ARCON Elements:

Partnership = Structural
Integration = Functional and Componential
Coordination = Behavioral



General Concepts Level Model

Specific Modeling Level for CNO-G - Partnership

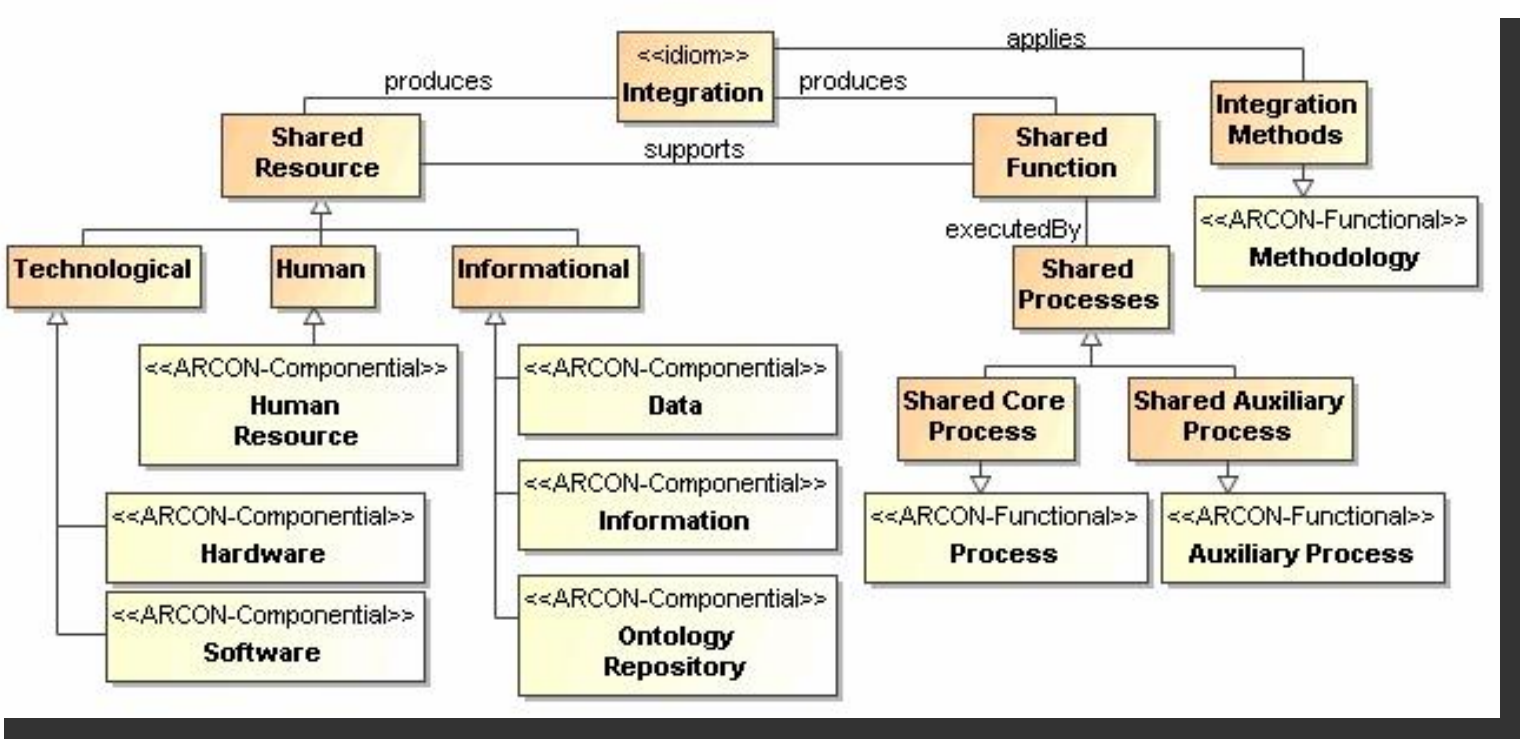


Refining Partnership - Mapping domain and ARCON elements

Partner = ARCON.Structural.Actor
Partner Role = ARCON.Structural.Role

Domain Partnership types include = PPP, MSP and Inter-Agency Collaboration

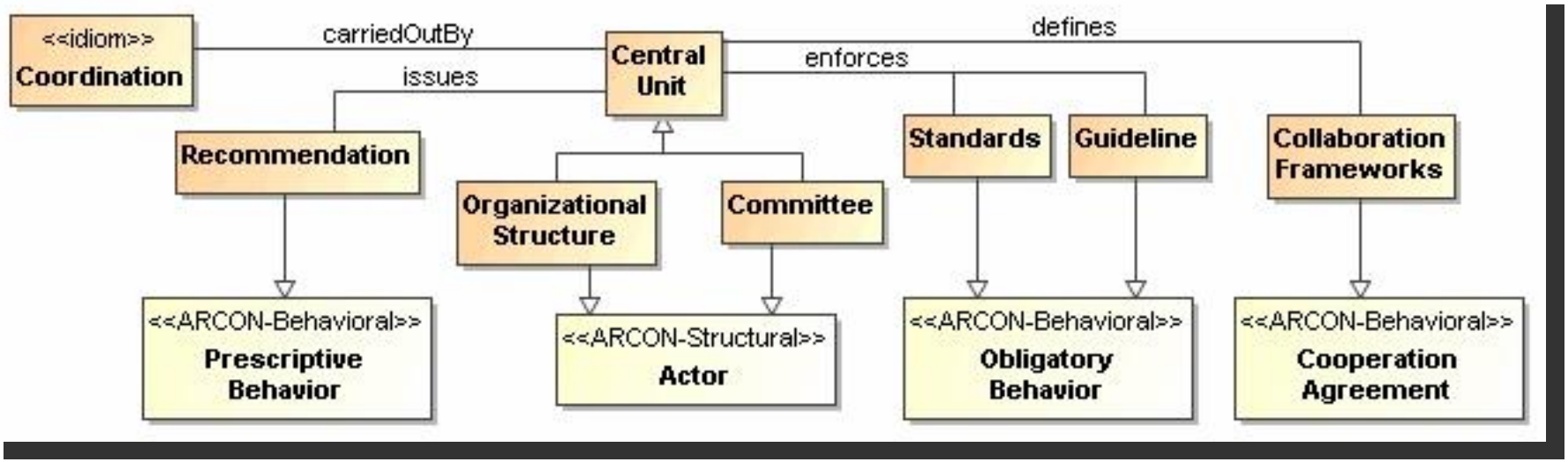
Specific Modeling Level for CNO-G - Integration



Refining Integration - Mapping domain and ARCON elements, examples …

Shared Resource = ARCON.Componential
Integration Method = ARCON.Functional.Methodology
Technological = ARCON.Componential.Hardware, ARCON.Componential.Software
…

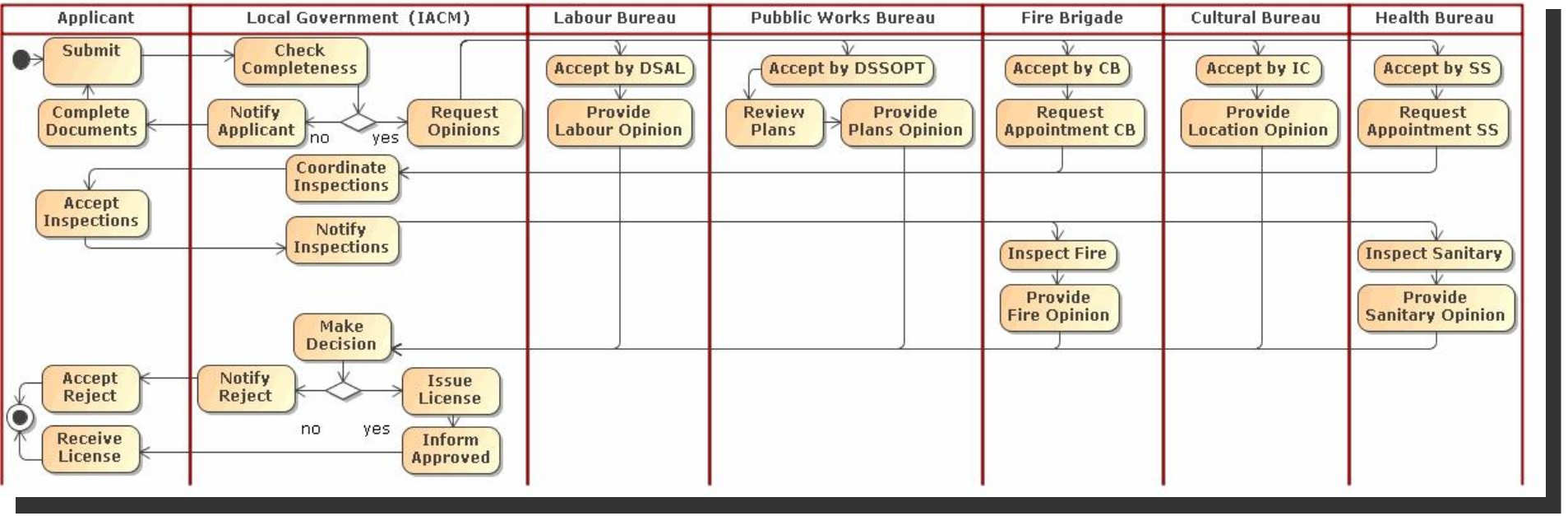
Specific Modeling Level for CNO-G - Coordination



Refining Coordination - Mapping domain and ARCON elements, examples …

Recommendations = ARCON.Behavioral.Prescriptive-Behavior
Standards, Guidelines = ARCON.Behavioral.Obligatory-Behavior
Collaboration Framework = ARCON.Behavioral.Cooperation-Agreement
…

Implementation Modeling Level for CNO-G – Domain Description

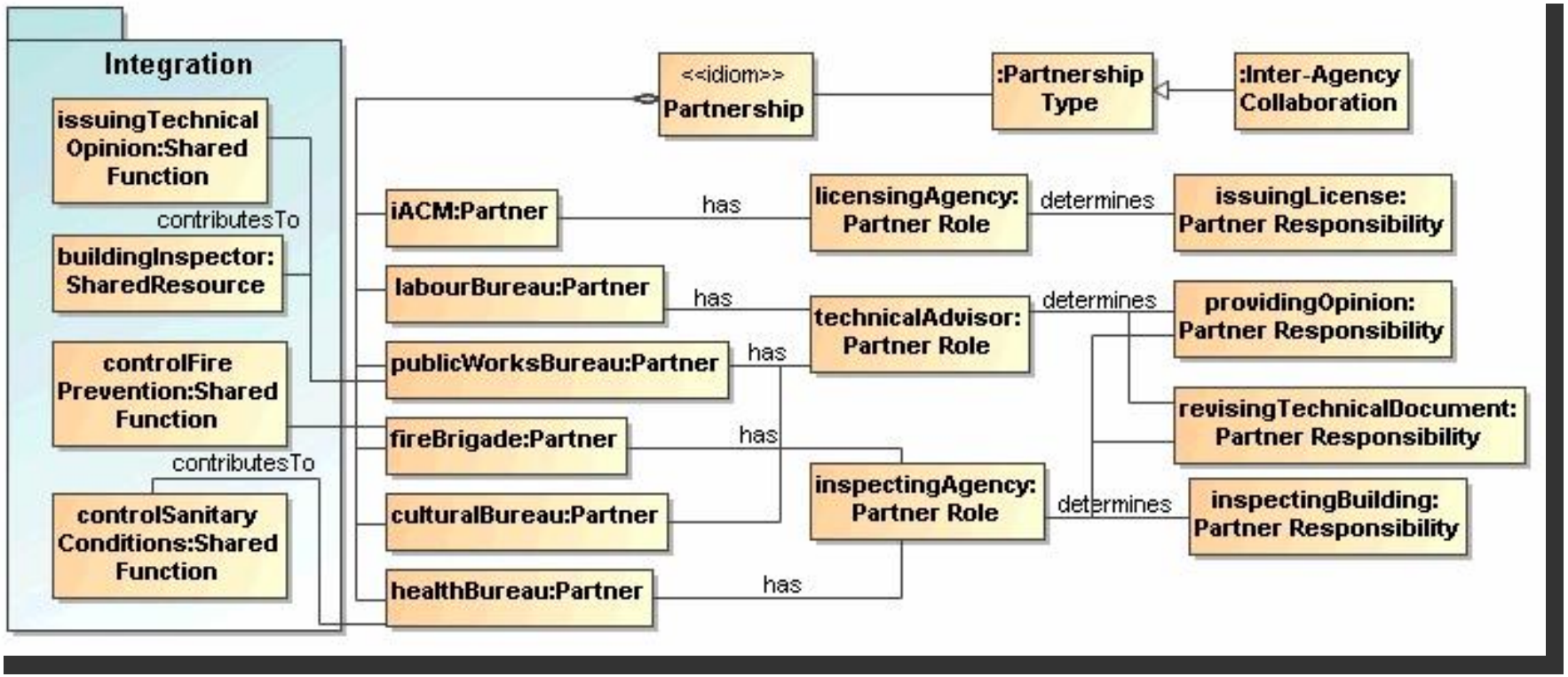


A Case Study involving the processing of application of business license was chosen

Involves over 6 agencies collaborating to seamless deliver restaurant business license

The licensing authority is the municipal authority (IACM). Services provided by other agencies include inspection of sites and technical opinions on proposal documents.

Implementation Level Modeling – Partnership



An object model to show the different partners, their roles and responsibilities

Also shows how a specific partner (e.g. Public Works Bureau) contribute to shared functions and resources

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Observations

1) We are able to successfully map the three domain constructs obtained from the four CNO-G paradigms to ARCON's In-CNO elements.
2) Domain specific modeling cases could contribute to the list and organization of specific elements under each of the four ARCON perspectives In-CNO. For instance, from our example, we have grouped elements under the componential dimension into - technological, human and information.
3) From the usage experience, some definitions of the of ARCON dimensions may be easily "overloaded" or "restricted". For instance, our interpretation of componential dimension is equivalent to the resource dimension. However, strictly speaking from the definitions provided in [Camerinha-Matos and Afsarmanesh, 06] of componential dimension including "individual tangible or intangible element of in the CNO's network" , we are unsure if our notion of network components as resources is restrictive.
4) In view of 3, an ARCON ontology may be useful
5) We are unsure of how overall collaboration goals will is captured in the ARCON – CNO-G is goal oriented. Part of behavior specification ?

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Conclusion

- ARCON enabled us to describe the internal aspects of a CNO-G using our domain specific constructs or idioms derived from different but related CNO-G paradigms.
- Given our purpose – understanding and characterizing CNO-G, ARCON-based conceptual modeling (even at specific modeling level and implementation) will suffice.
- Our ongoing work involves developing “In-CNO” modeling other forms of CNO-G; for instance those supporting policy integration or disaster management in government, using our ARCON-based idioms. This goal is better understand different CNO-G forms

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