



A Semiotic Approach for Multiagent Systems Situational Development

AOSE 10 – 11th International Workshop on
Agent Oriented Software Engineering at AAMAS 2010
Toronto – May 2010

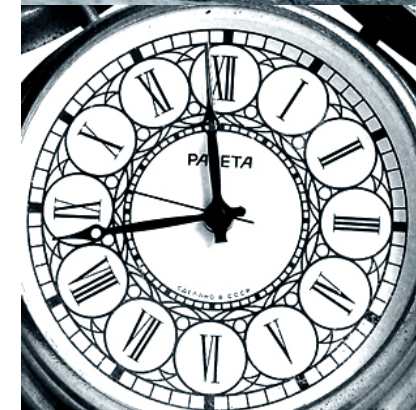
Sara Casare, Anarosa A. F. Brandão and Jaime S. Sichman

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Summary

1. Motivation and Goal
2. MAS Semiotic Taxonomy
3. Example of Usage
4. Current and Further Work



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Motivation

Organization Centered & Agent Centered MAS

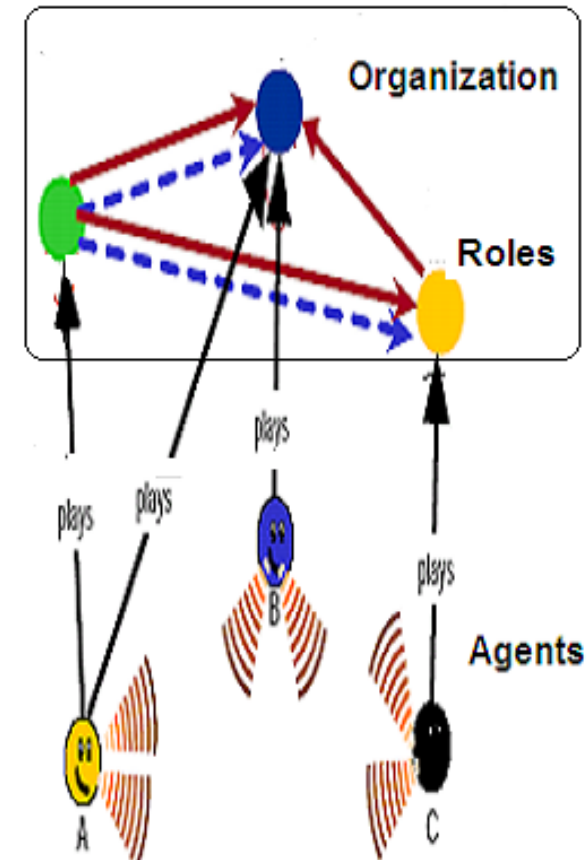
➤ Organization centered MAS approach

- Leading concept: “Agent Organization”
- Sociological & organizational vision for modeling MAS

➤ Agent centered MAS approach

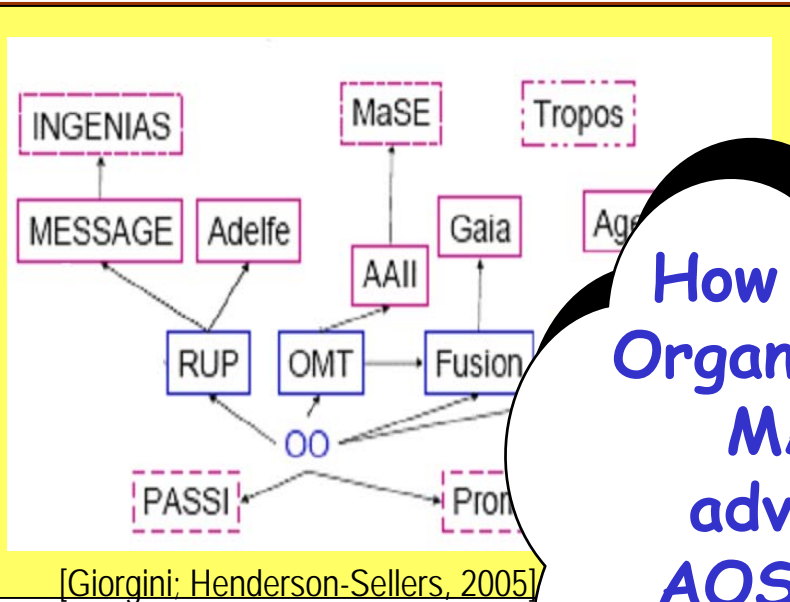
- Leading concept: “Agent”
- Agent architecture and agent’s “internal” knowledge

[Lemaitre; Excelente 1998]



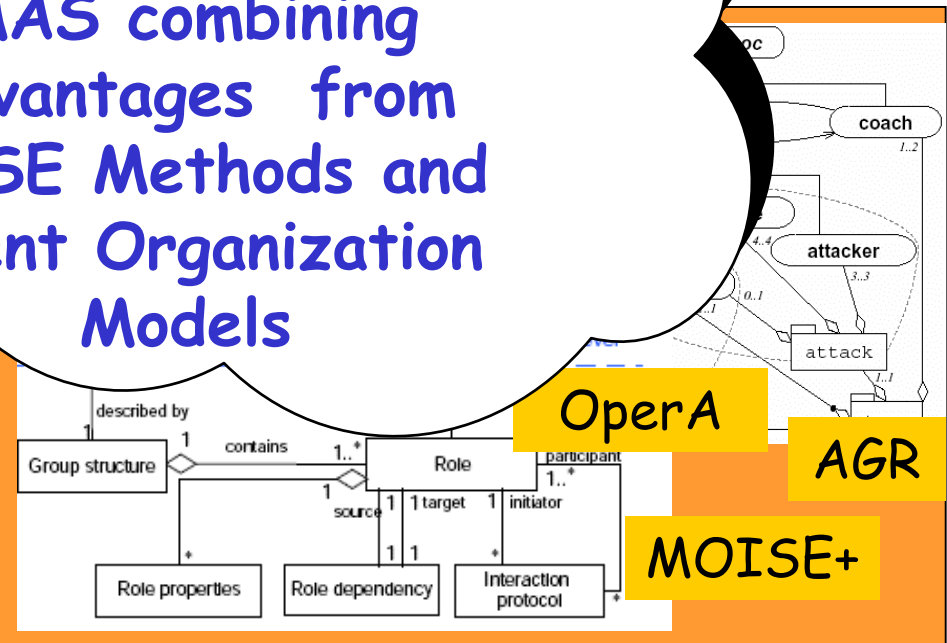


Motivation



[Giorgini; Henderson-Sellers, 2005]

How can we develop Organization Centered MAS combining advantages from AOSE Methods and Agent Organization Models



... considering that some Agent Organization models are not currently incorporated into AOSE methods



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MAS Semiotic Taxonomy

Goal

First step towards combining AOSE methods & Agent Organization models providing:

- ✓ set of categories to identify MAS development aspects
 - AOSE Methods
 - Agent Organization Models
- ✓ foundation for building MAS method fragments' repository to create MAS methods on demand



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MAS Semiotic Taxonomy Utilization Context

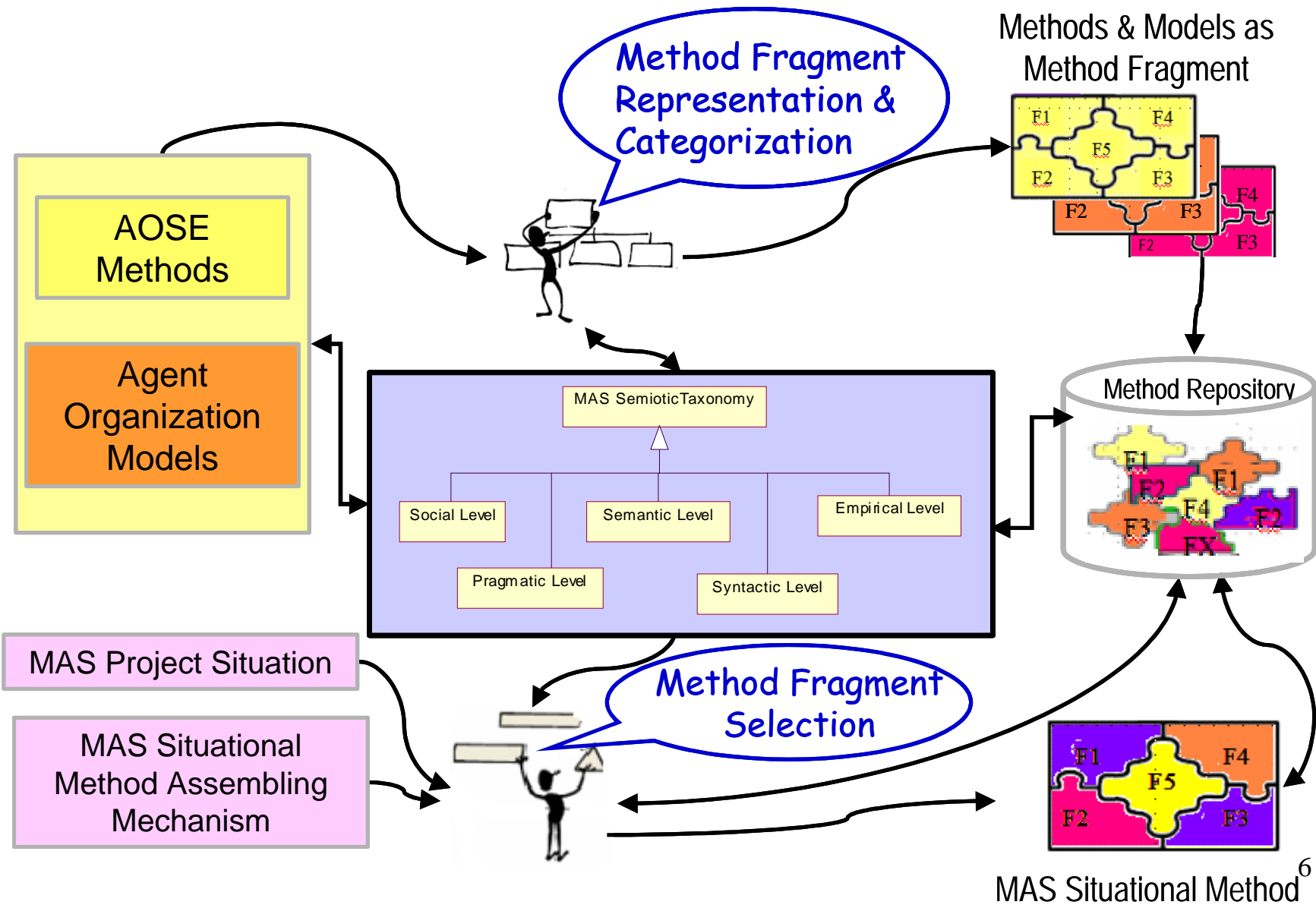


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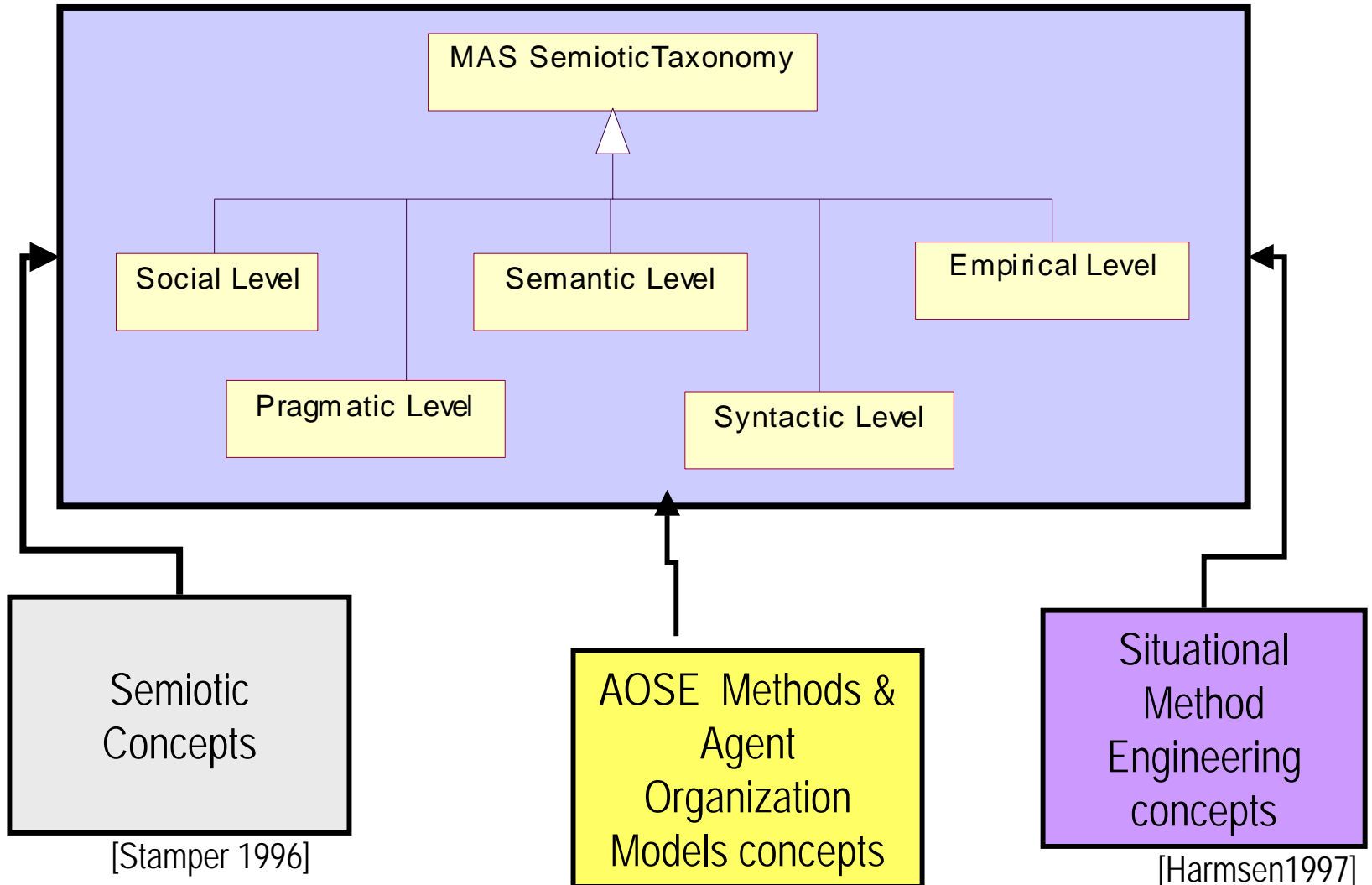
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MAS Semiotic Taxonomy Big Picture



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MAS Semiotic Taxonomy

Semiotic Concepts

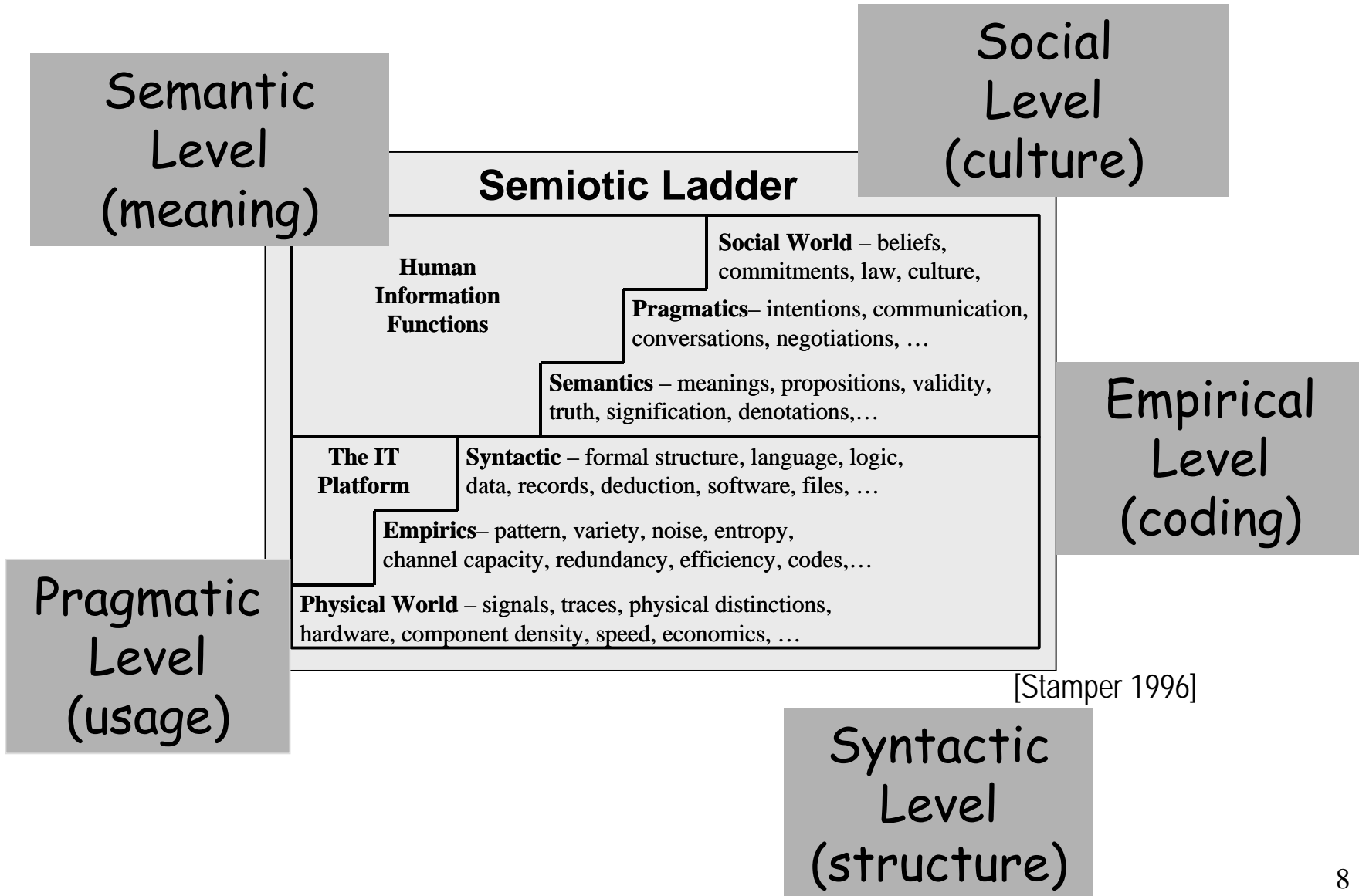


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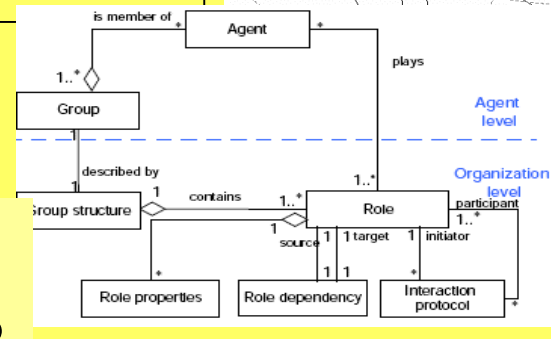
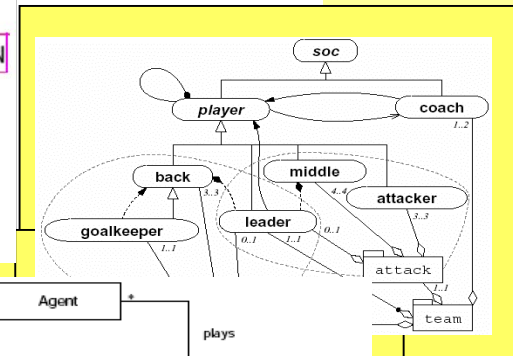
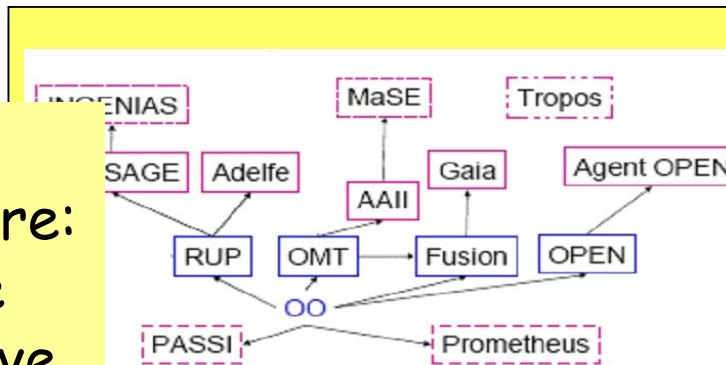
AOSE Methods and AO Models concepts

Goal Oriented Analysis.
Use Case based Analysis

UML
AUML

Platform:
Jack
Jade
Jason

Agent
Architecture:
Reactive
Deliberative
Hybrid



Organizational
Dimension:
Structure
Functions
Norms
Interactions

Open MAS
Closed MAS

Agent Centered MAS
Organization Centered MAS

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MAS Semiotic Taxonomy

Situational Method Engineering concepts

Validation Degree

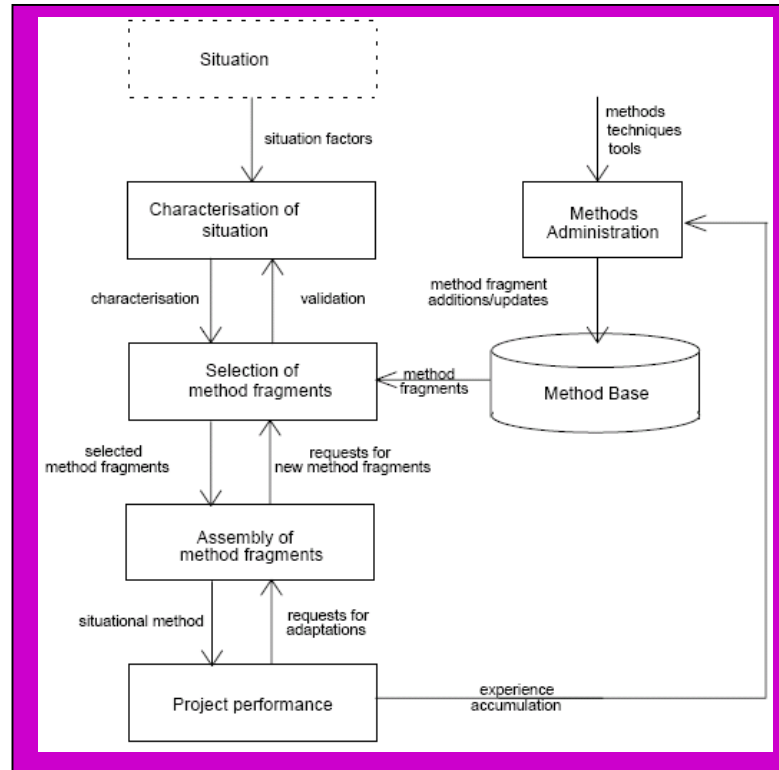
Linear develop.
Iterative develop.

Reuse Degree

Fragment Source

Utilization Degree

Method Process



[Harmsen1997]

Experimental develop.
Analytical develop.

User Participation Degree





MAS Semiotic Taxonomy

Pragmatic Level

MAS development aspects classified according to usage and intention

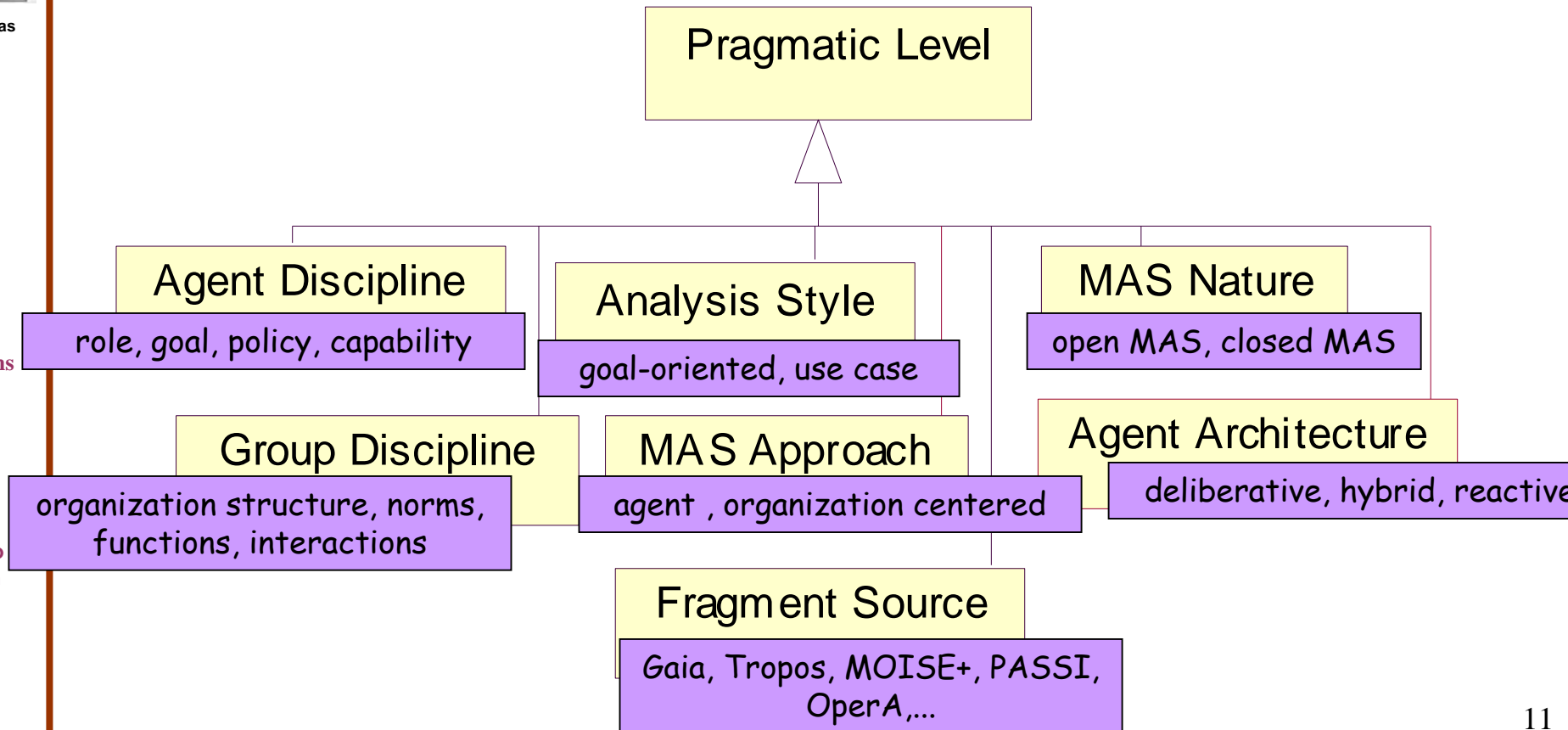


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Example of Usage

Navigation Tree for a MAS Method Repository

Five levels

Semiotic Taxonomy

Where am I | Tree Sets

MAS Semiotic Taxonomy

- [-] Social Level
- [+] Utilization Degree
- [+] Reuse Degree
- [+] Validation Degree
- [+] User Participation Degree
- [+] Iteration Degree
- [+] Development Type
- [-] Pragmatic Level
- [-] Analysis Style
- [-] MAS Approach
 - [-] Agent Centered MAS
 - [-] MMF Tropos Base Method
 - [-] MMF PASSI Base Method
 - [+] Organization Centered MAS
- [-] MAS Nature
 - [+] Open MAS
 - [+] Close MAS
- [+] Agent Architecture
- [+] Agent Discipline
- [+] Group Discipline
- [+] Semantic Level
- [+] Syntactic Level
- [+] Empirical Level

Pragmatic Level > MAS Approach > Organization Centered MAS

Organization Centered MAS

Medee Custom Category - MAS Semiotic Taxonomy

Sub-categories

Contents

- Organization Oriented MAS
- Agent Oriented Engineering

Description

Main Description

Organization Centered MAS category classifies method fragments that consider the group and organization as leading concept, instead of the agent.

Method Fragments

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Current & Further Work

- ✓ A Semiotic Taxonomy enabling method fragments categorization in a MAS Method Repository
 - implemented as a SPEM Category
 - used as Navigation Tree for browsing method fragments

- ✓ A MAS situational reuse mechanism involving a semiotic criteria



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