INSPIRING INNOVATION | INNOVANTE PAR TRADITION

Ecole Nationale Supérieure des Mines
SAINT-ETIENNE

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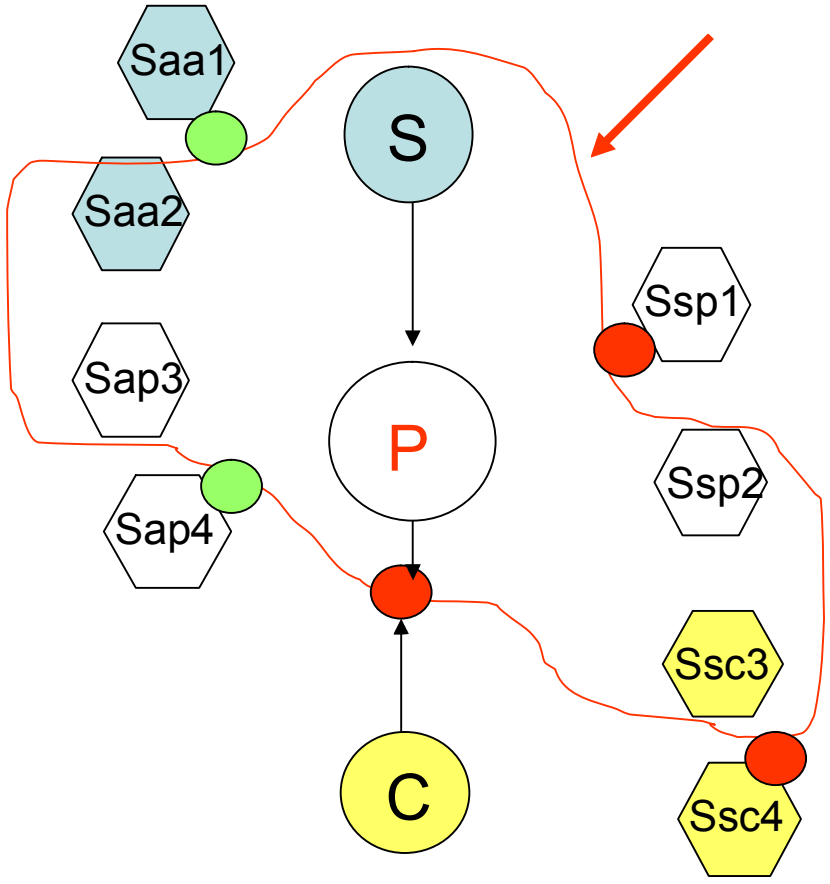
A MULTI LAYER FRAMEWORK FOR VIRTUAL ORGANIZATIONS CREATION IN BREEDING ENVIRONNEMENT

MINISTÈRE DE L'ÉCONOMIE
DES FINANCES ET DE L'INDUSTRIE

Outline

- Introduction
- Requirements
- Multi layer framework
  - Service Domain layer
  - Management system layer
  - Semantic layer
- Conclusion

Enterprises collaboration can be seen as a composition of **business services**

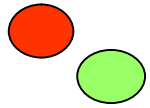


Service adressed to support activities
(ex :IT system, accounting, ...)

Service adressed to supply product
(ex : design, packaging, ...)

Service supplied for product functionning
(ex : maintenance, training, assistance...)

support Service supplied to customer
(ex : marketing,logistic support , financing,...)



Interface with partners

The strategy and the economic model define the frontier of the firm, the services outside the firm boundary will be managed through partnership.

Two parallel developments for collaboration paradigm

Frameworks for VO Management (in VBE)

- Business approach:
  - Focused on the management process of VBE and VO
  - General reference architecture model remains to be established
  - Only “local” interoperability for the supporting tools

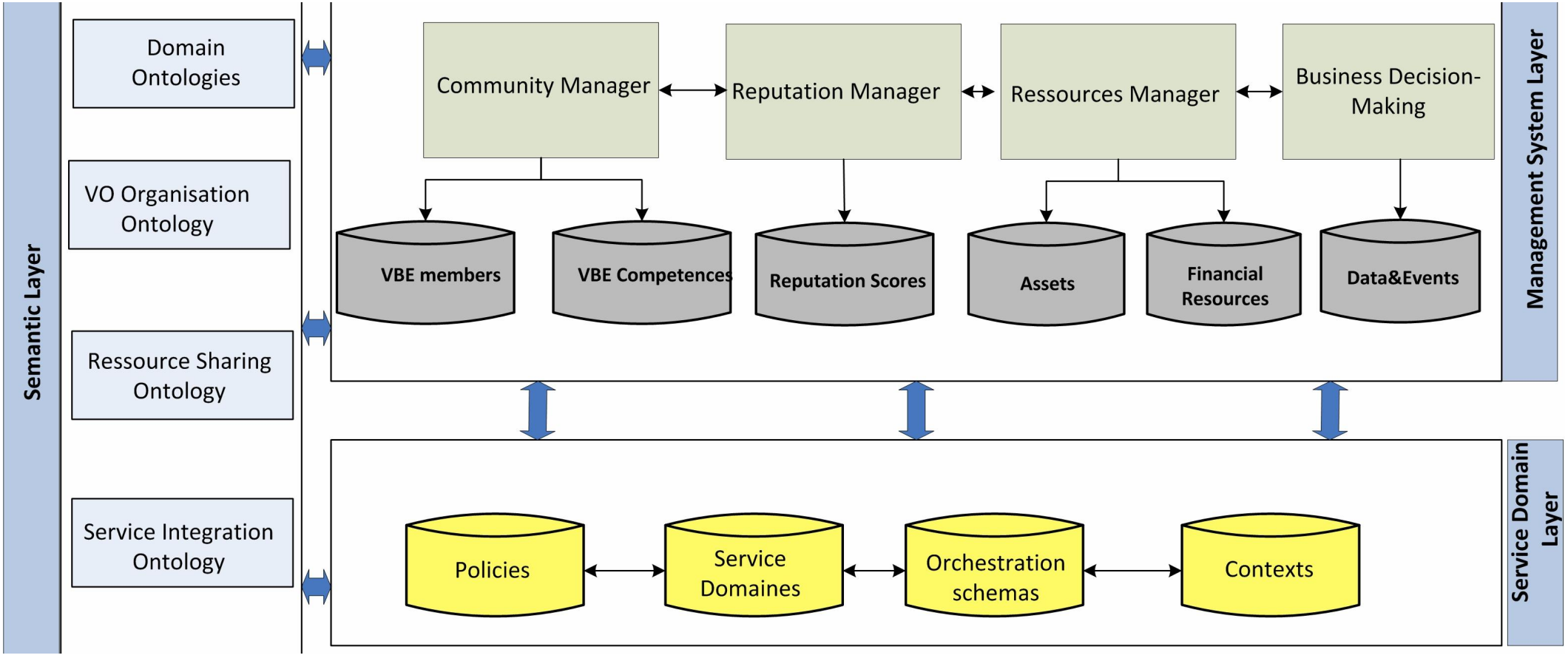
Problem

How to associate these two complementary approaches to developp a consistant MDE ?

- IT approach through Service Oriented Architecture :
  - Focused on dynamic interaction
  - Adaptable IT infrastructure can be bundled and offered as IT or Web services
  - Generic methodologies to develop high level services remains to be established

Service oriented approaches for Collaboration management

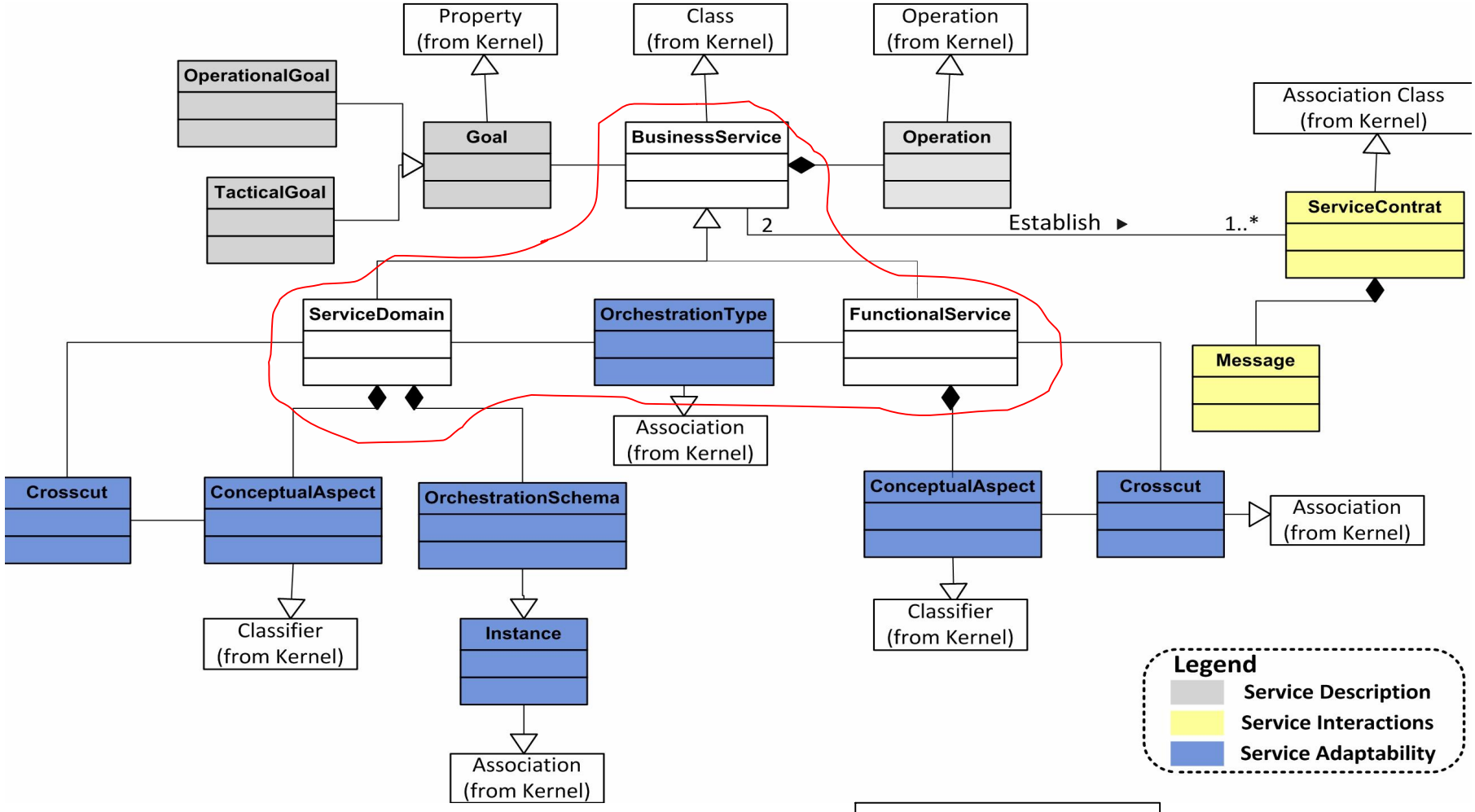
MULTI LAYER FRAMEWORK Proposed



Contextual Service Oriented Modeling and Analysis (CSOMA) : Metamodel (prove09)

BUSINESS Level

BUSINESS SOA Level



IT SOA Level

Concepts involved in the Business service profile

Business service: is a core class modelling entity in our business SOA meta-model

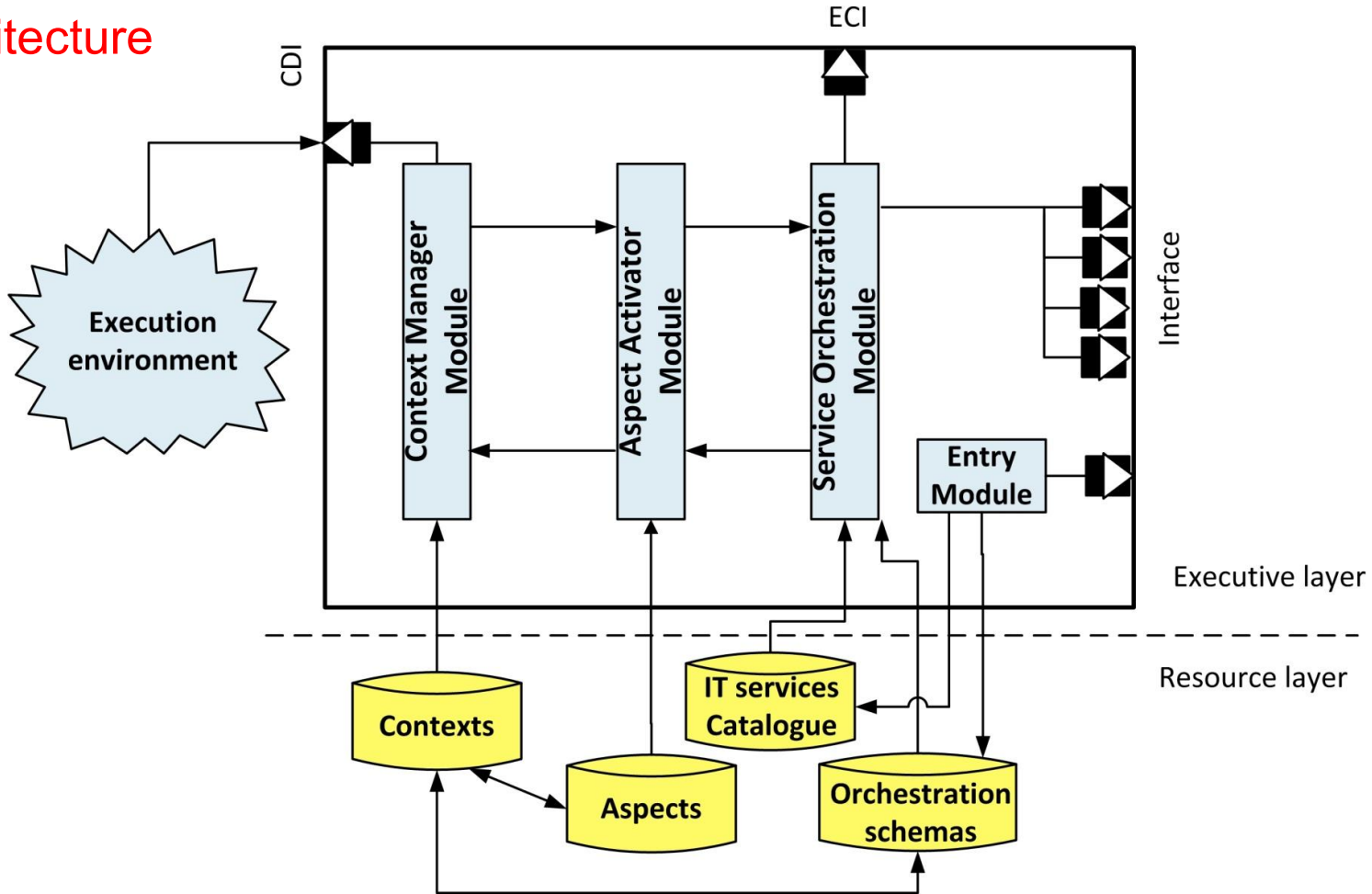
- Business services are responsible for expressing business logic through service-orientation
- Business services are identified when analyzing enterprise business processes
- Business services can be atomic services called functional or composite services called service domains

a high level structure used to manage enterprise IT services to :

- hide complexities from service consumer
- simplify deployment for service providers
- be used as building block to implement collaborative business processes

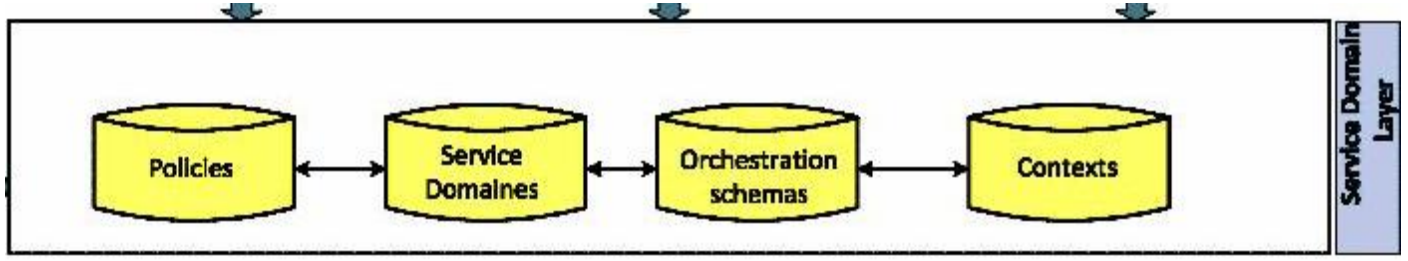
with a support architecture

:



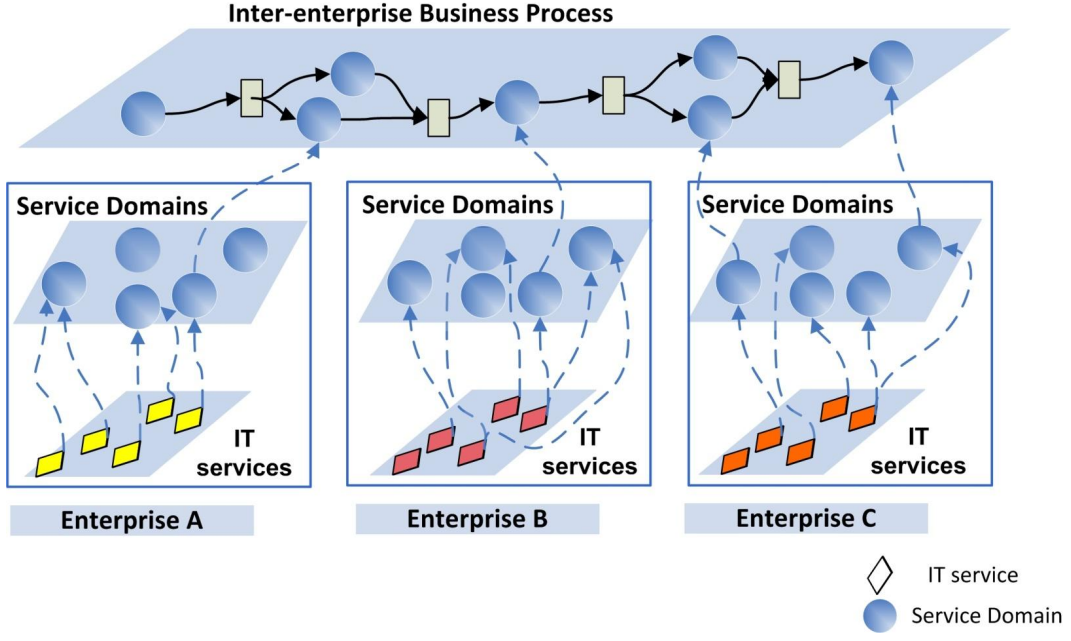
Now we have at our disposal

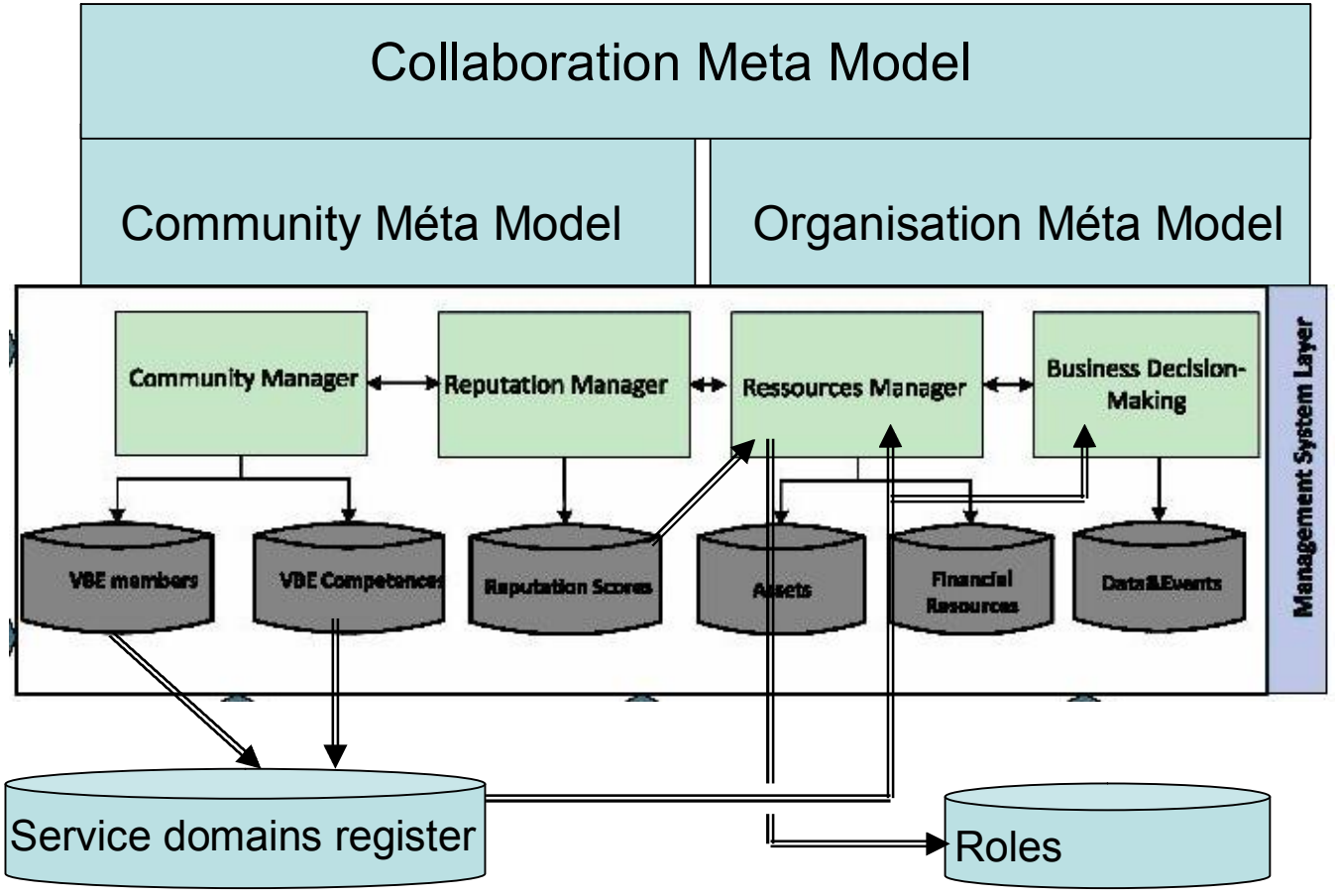
building block to implement collaborative business processes



But we need

methodology to design and implement collaborative business processes





The Managers are implemented as set of services

Community : set of firms with the same class of activities (a bit different of VBE)

Management Needs (detection,attracting, evaluation, ...):

- Intangible competencies (behaviour, management, …)
- Operationnal competencies (technical, functionnal) : list of service domains proposed

✓ Community manager

✓ Reputation manager

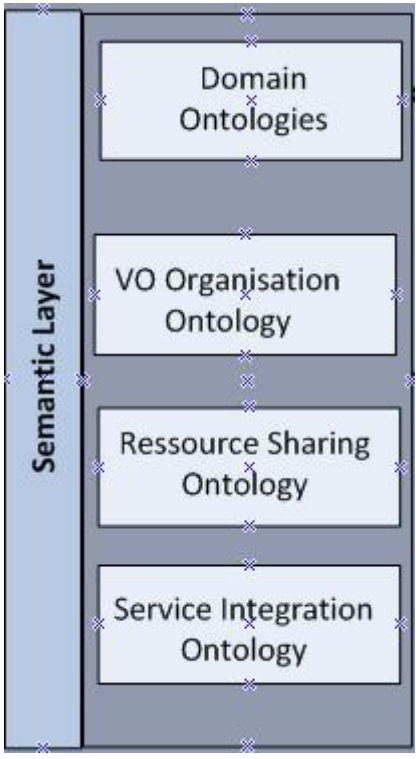
Organization :

✓ Ressources manager

- Roles assigned to the partners in the VO (depending on their features and ressources)
- Common ressources management

✓ Business Decision Making manager

- VBE level : makes information clearer on business opportunities
- VO level : supports collaborative work



- Domain ontologies help in the collaborative work and ensure that organizations are negotiating about the very same good/product/service

- VO Organisation Ontology
  - Roles modelling (mission ensured, macro-competencies needed, commitments required, constraints, ...)
  - Goals modelling

- Ressource Sharing Ontology describes information resources that is understandable and usable by the VBE members

- Service Integration ontology is to perform mediation processes in order to resolve the semantic heterogeneity problem between services participating in a VO

* Conclusion

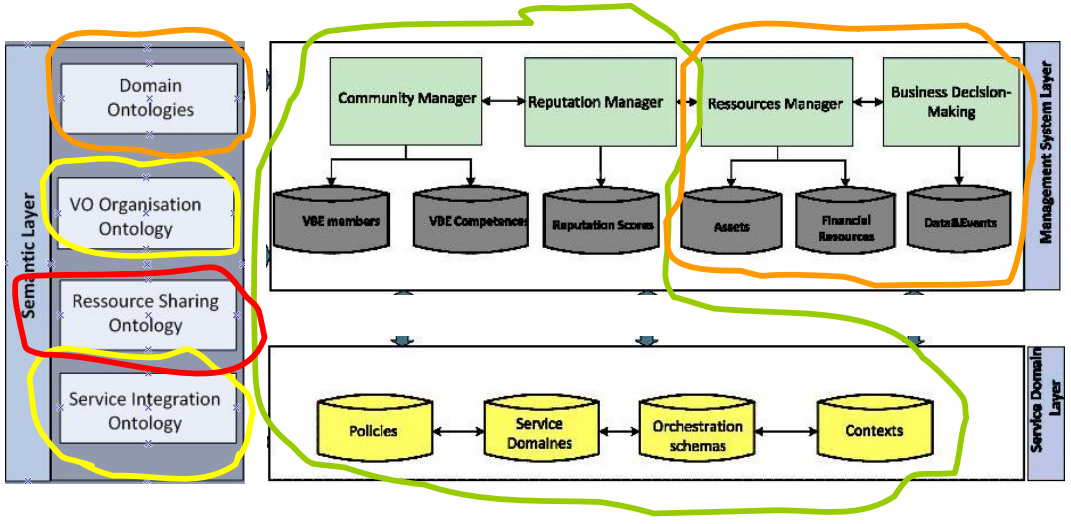
Key Contributions

- Business Service approach and collaboration processes are increasingly embedded

  → a three layer framework based on a service oriented architecture

  - A high level structure to encapsulate business process of partners
  - A decision making support to design and manage collaborative business process
  - A semantic modeling of VO concepts to improve the integration of partners

Work in progress



— Fully developped (models, methodologies and IT support)
— To complete (generally IT supports to develop)
— To extend (concepts, models and support to add)
— To study (just mentionned)

- Test the proposed framework on an empirical case

In more depth …

BOUKADI. K., GHEDIRA. C., VINCENT. L., "Enhancing Enterprise Collaboration Using Context-Aware Service Based on Aspects". 10th International Conference on Enterprise Information Systems (ICEIS 08), Barcelona, Spain

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BOUKADI. K., VINCENT. L., BURLAT P., "Modeling adaptable business service for enterprise collaboration". 10th IFIP Working Conference on Virtual Enterprises (PROVE09),Thessaloniki, Greece

ZAIDAT A. "Spécification d'un cadre d'ingénierie pour les réseaux d'organisations".
Phd Thesis in Industrial Engineering, Ecole des Mines-Saint Etienne, France, 09/2005.

IZZA S. "Intégration des systèmes d'information industriels : une approche flexible basée sur les services sémantiques". (in cooperation with ST Microelectronics)
Phd Thesis in Computer Science, Ecole des Mines-Saint Etienne, France, 11/2006.

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Phd Thesis in Computer Science, Ecole des Mines-Saint Etienne, France, 5th/11/2009.

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Thanks for your listening

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