TOWARDS BUSINESS ONTOLOGIES MATCHING FOR INTER-ENTERPRISE COLLABORATION PLATFORM IN A LEAN MANUFACTURING STRATEGY

AUTHORS :

- Ahlem Zayati LIESP, INSA-Lyon & LIP2, FS-Tunis
- Lilia Sidhom AMPER, INSA-Lyon
- Youakim Badr LIESP, INSA-Lyon
- Frédérique Biennier LIESP, INSA-Lyon
- Mohamed Moalla LIP2, FS-Tunis

INTRODUCTION (1/2)

- **Emergence of new strategies forms:**
  - Mass Customization: Lean Manufacturing
- **Structural and organizational changes:**
  - Business refocusing
  - Inter-enterprises collaboration

INTRODUCTION (2/2)

- **Lean Manufacturing strategy:**
  - Enterprise value chain definition
  - Wastefulness eradication
- **Inter-enterprise collaboration:**
  - Agile & open Information System (IS)
- **Global value chain of collaborative network:**
  - Enterprise Interoperability

CONTEXT (1/3)

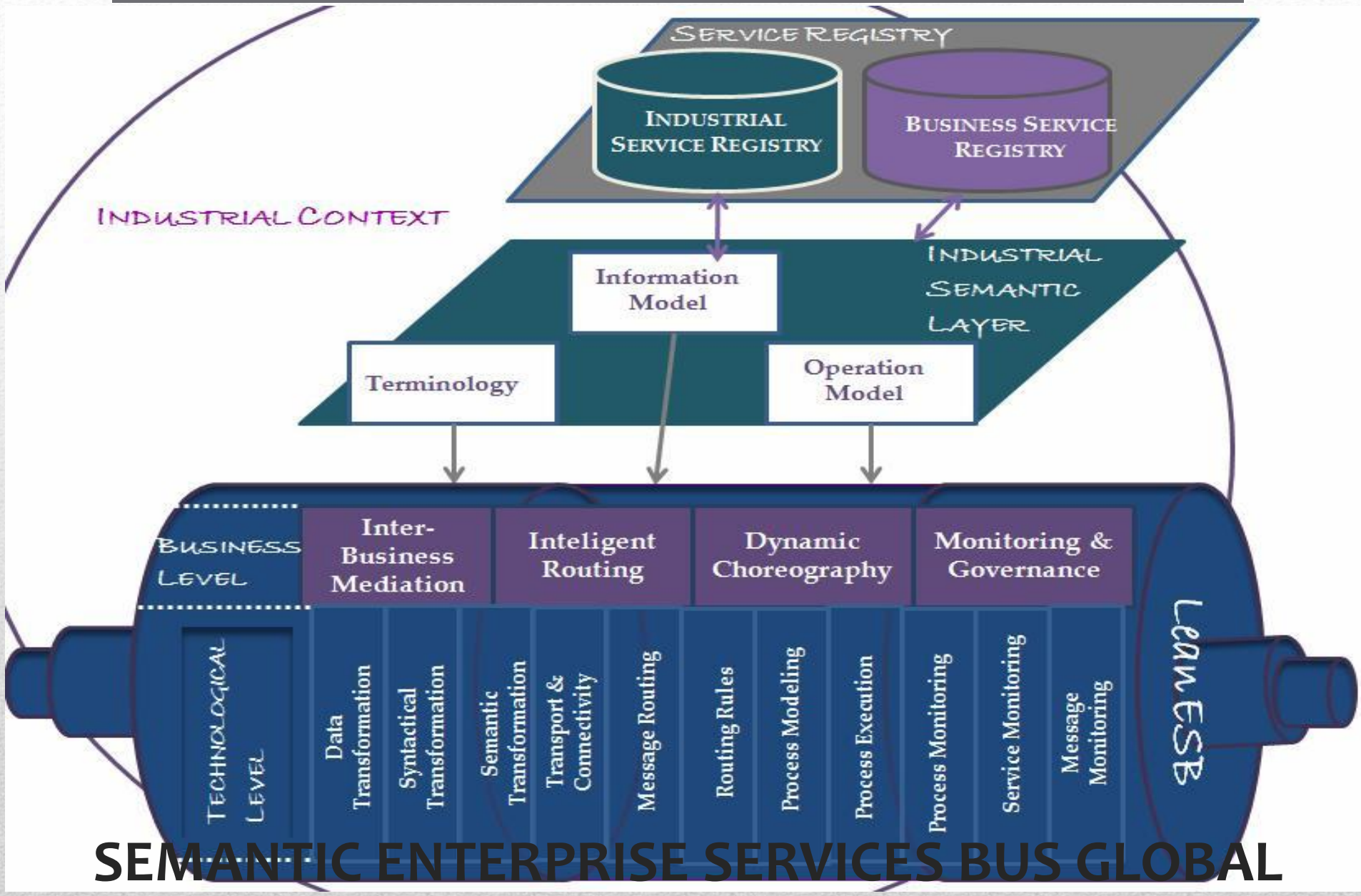
- **Enterprise IS complexity:**
  - Growth of enterprise technologies
- **Interoperability problems** *[1]***:**
  - **Conceptual:** semantic & syntactic presentation of high level information modelling
  - **Technological:** inconsistency of information technologies
  - **Organizational:** authority & responsibility definitions of work conditions

CONTEXT (2/3)

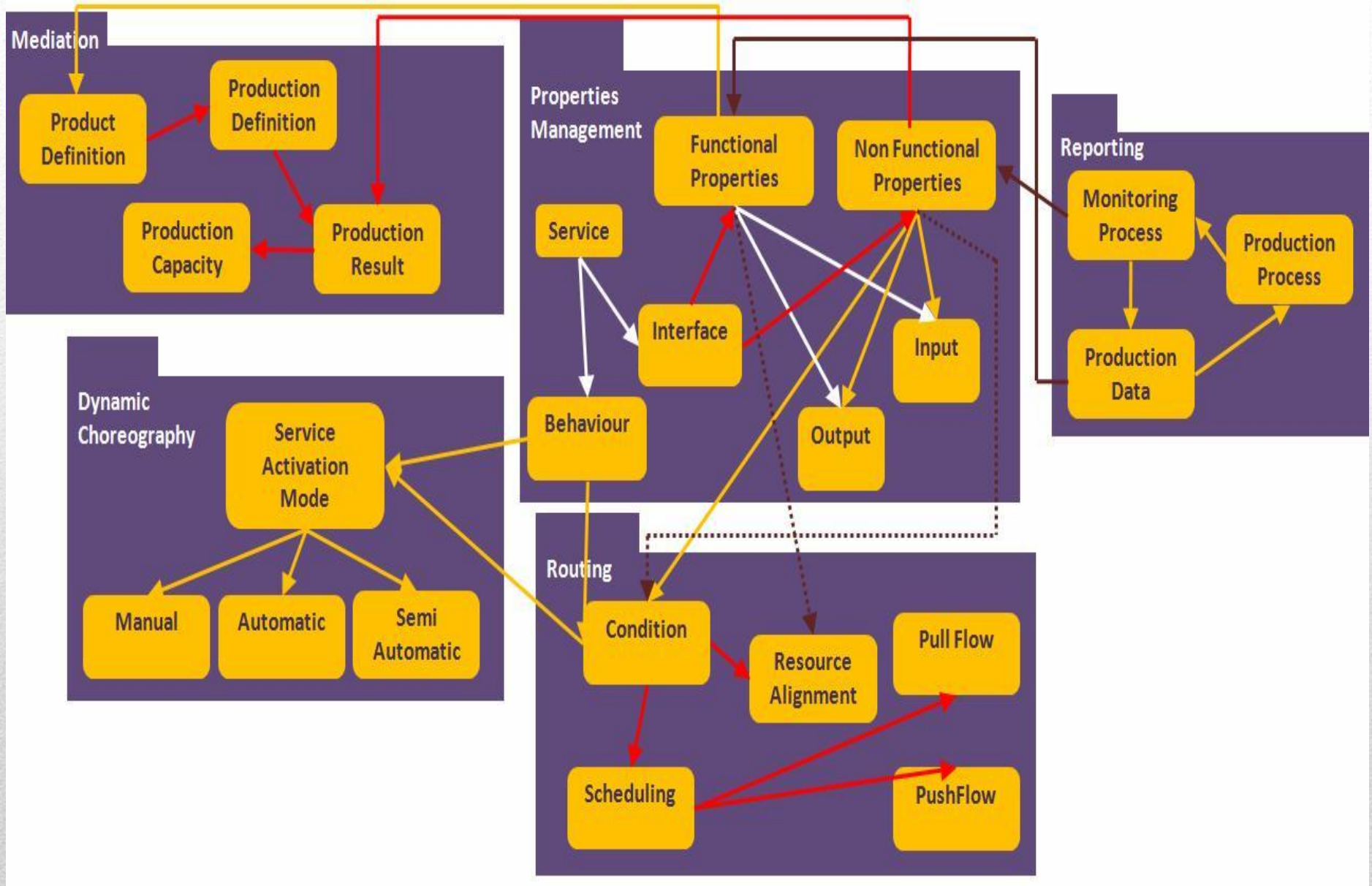
- **Interoperability levels** *[1]*:
  - **Business level:** global organization harmonisation
  - **Process level:** processes interaction (enterprise specific needs)
  - **Service level:** common functions for enterprise applications (semantic and syntactic aspects)
  - **Data level:** data models in a collaborative work and conceptual schema organization

CONTEXT (3/3)

- **Service-Oriented Architecture (SOA) [2]:**
  - **Flexibility and openness**
  - **Loosely coupled approach:** "service" notion
  - **Technological** interoperability
  - **Syntactic** mediation
  - Lack of **business semantic mediation**



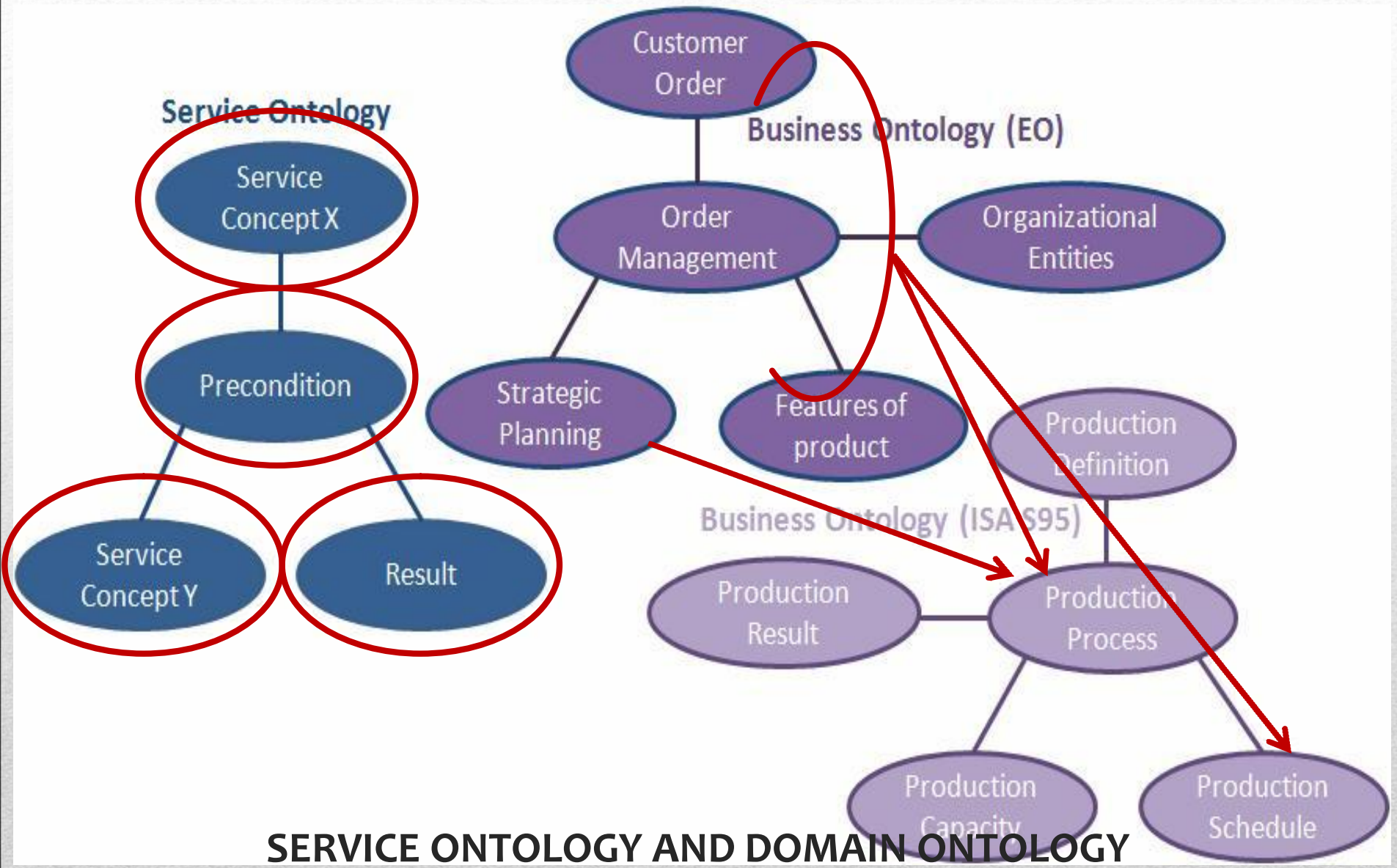
SEMANTIC ENTERPRISE SERVICES BUS GLOBAL ORGANIZATION



THE INDUSTRIAL SERVICE MODEL

PIVOT ONTOLOGY

- **ISA S-95 [3]:**
  - International standard for the **integration of enterprise & control systems**
  - Data models definition: **production and performance models**
- **Enterprise Ontology [4]:**
  - The basis for a **shared organization understanding**
  - **Flexibility and coherent communication**



SERVICE ONTOLOGY AND DOMAIN ONTOLOGY BUSINESS PIVOT ONTOLOGY MATCHING PROCESS ACCORDING TO YASA4WSDL [5]

CONCLUSION

- Towards an enterprise IS fully “interoperable” to support Lean Manufacturing & inter-enterprises collaboration strategies
- Business pivot ontology thanks to YASA4WSDL: Business and technological alignment
- Our prototype extends the SemEUsE semantic ESB [6]

BIBLIOGRAPHY

1. Daclin, N. & Charpulat , V., (2008) “Evaluation de l’Interopérabilité Organisationnelle et Managériale des Systèmes Industriels : le projet Carioner”, CEROM – MTO, 2008
2. Khoshafian S., “Service Oriented Enterprise”, a book by Auerbach Publications Taylor & Francis Group, 2007
3. ANSI/ISA, “Enterprise Control System Integration - Part I: Models and Terminology for Enterprise-Control System Integration”, 2007
4. Uschold M. & Gruninger M., “ONTOLOGIES: Principles, Methods and Applications”, Knowledge Engineering Review Vol. 11-N°2, 1996
5. .Chabeb Y. & Tata S., “Yet Another Semantic Annotation for WSDL (YASA4WSDL)” Proceedings of the IADIS WWW/Internet 2008 Conference pp. 437–441. 2008
6. Petals White Paper :

http://petals.ow2.org/docs/PEtALS-Architecture-3-07-09.pdf

THANK YOU FOR YOUR ATTENTION