

*Legal Considerations  
for  
Web Services,  
Federated Systems  
and  
E-Commerce*

# Current State of Affairs

- Business partners are increasingly seeking relief from failed expectations in their business relationships
- Business partners are increasingly incorporating Quality of Service expectations in their agreements to do business
- Corporate security policies and procedures are increasingly being owned by legal departments
- Clients are requesting functionality that address legal issues

# The Proposition

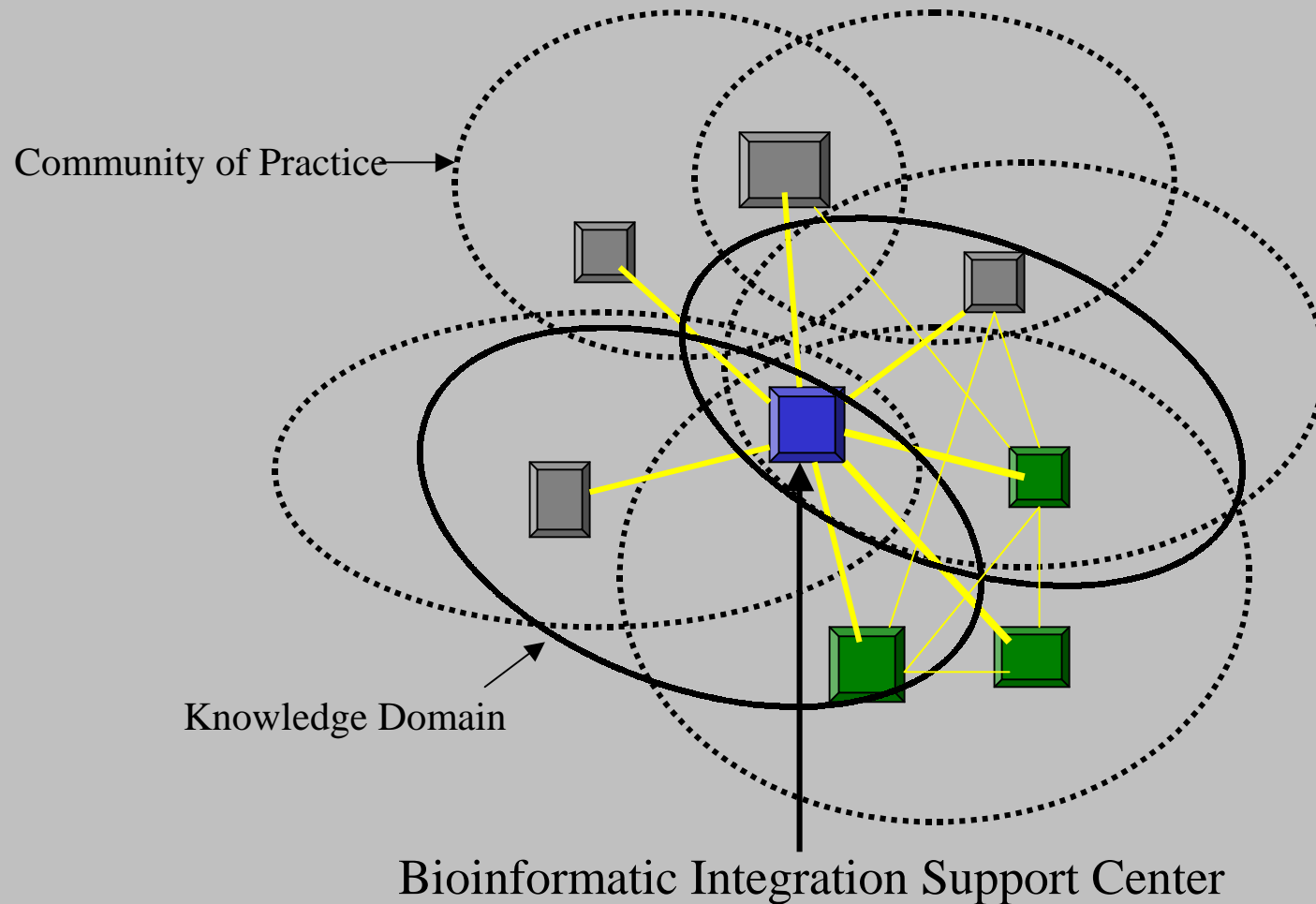
- Architect and engineer (design, model) legally-oriented processes into federated systems. The models and software implementations can be used to help avoid litigation (and improve overall quality and security)
- Help reduce the time and costs of litigation by providing evidence

# Presentation Strategy

- Part I
  - Problem Presentation: High-level legal view of needs, requirements, and architecture for a federated bioinformatic system
  - Context for Analysis and Design
- Part II
  - Application of MDA and UML in architecting and engineering a solution

# High-level Legal View of Needs, Requirements, and Architecture for a Federated Bioinformatics System

# The Federated Bioinformatic System Problem



# High-level Properties and Characteristics of Federated Bioinformatic System

- Distributed
- Heterogeneous
- Approximately 100 enterprises
- Enterprises participate in multiple communities of practice
- Enterprises belong to specific domains of knowledge
- Enterprises belong to public and proprietary domains
- Enterprises include government agencies, research labs, clinical labs, research consortiums, pharmaceuticals, hospitals
- Each enterprise has its own set of legal, quality, information, and security standards, policies and procedures
- A mission (and “safety”) critical system to enhance the discovery and application of new medical therapies

# High-level Requirements for Federated Bioinformatic System (Parital List)

- Requires shared data, information, knowledge and applications among all parties
- Requires collaboration among all parties
- Requires stringent security/ privacy measures
- Open-source development must be embraced
- All standards, policies and procedures of each enterprise must be respected
- Data integrity must be maintained
- Data models must be flexible, extensible, adaptable, maintainable
- Both structured and unstructured data sources must be manipulated and shared
- Requires a bioinformatic technology support center
- Requires Peer-to-Peer and ASP models

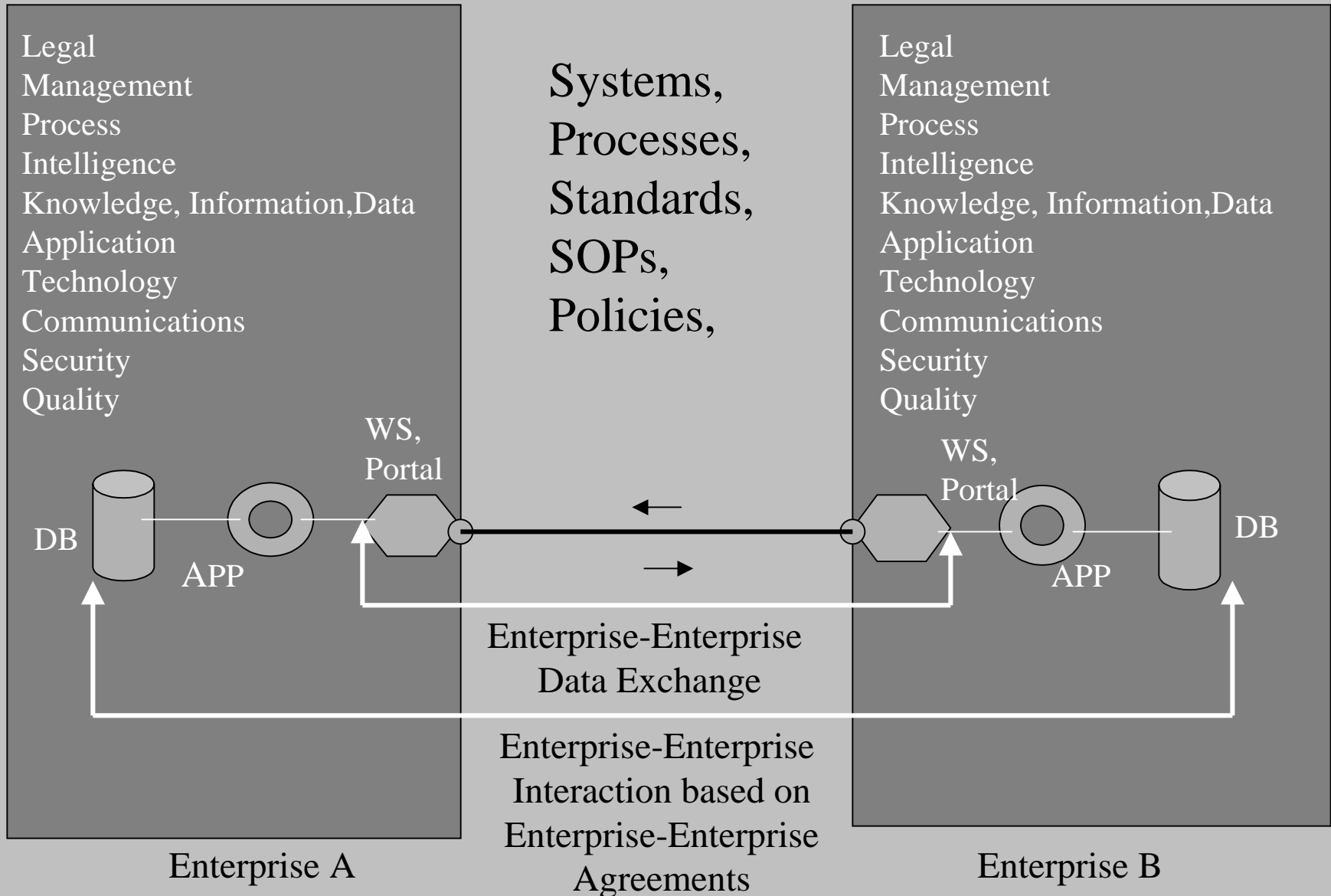
# Questions Asked by the Legal View

- What is the nature of the relationship between enterprises doing business? Degree of coupling and coherency?
- What is the degree of trust?
- What are the boundaries between enterprises?
- Who owns what?
- What are the expectations placed on each enterprise doing business with each other?
- What kind of liability risks are there?
- At what points, in the process of doing business, is there a liability risk to each enterprise?

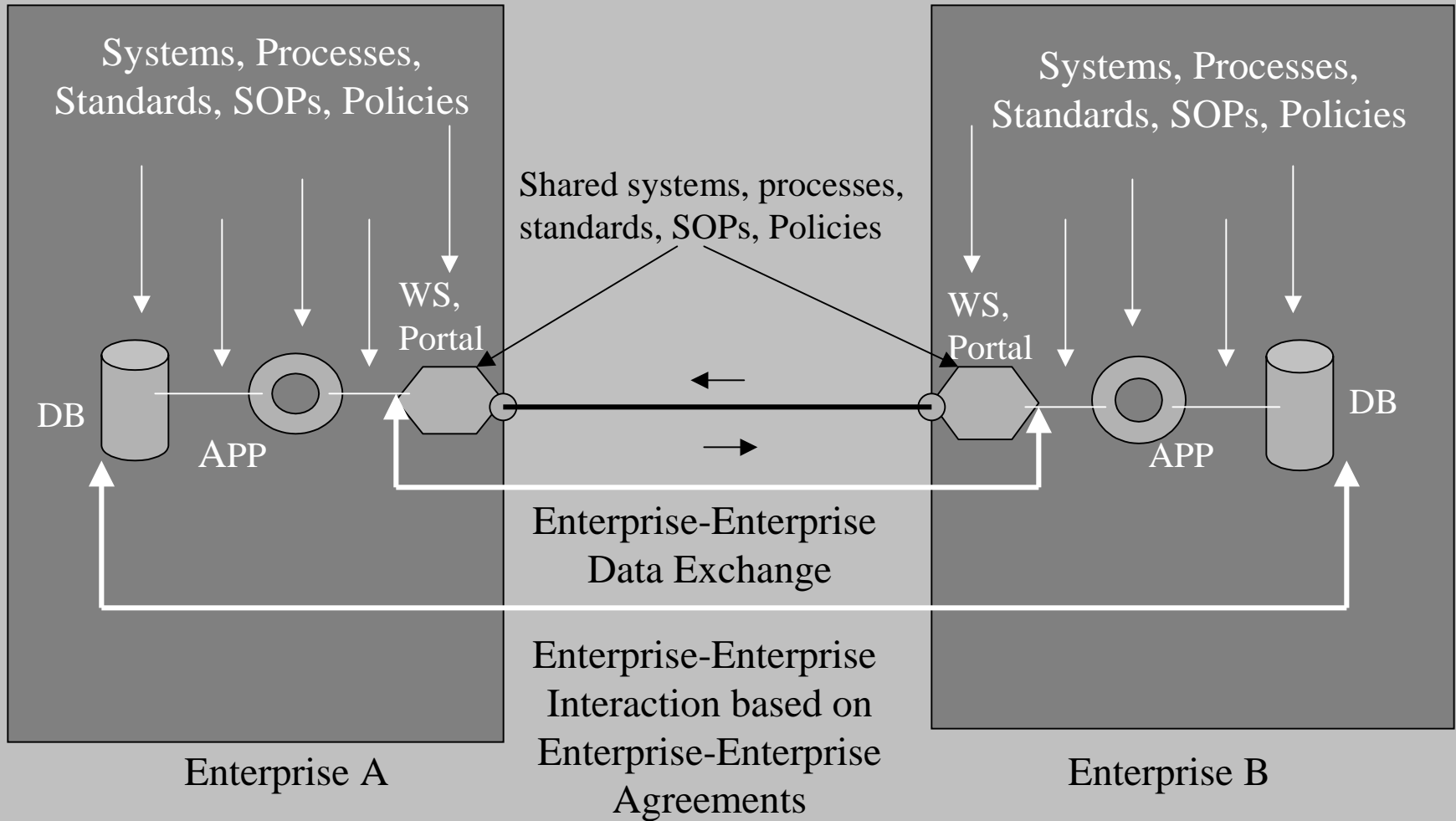
# Questions Asked by the Legal View

- Are there shared risks?
- Who's accountable?
- What processes can be put in place to ensure quality of service expectations are met?
- To what degree can a legal contract be modeled and embedded in a federated system?

# The Federated System Problem

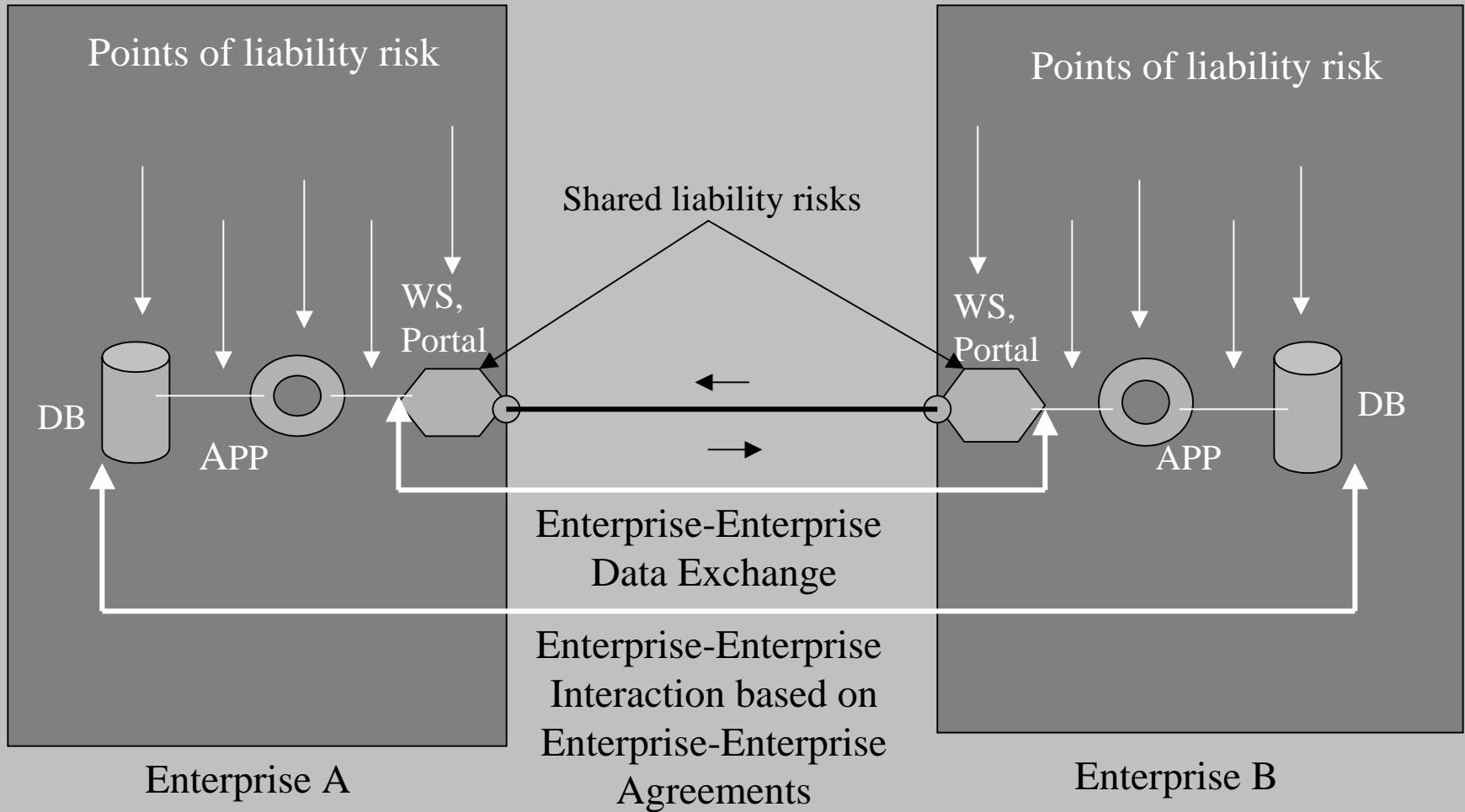


# The Federated System Problem



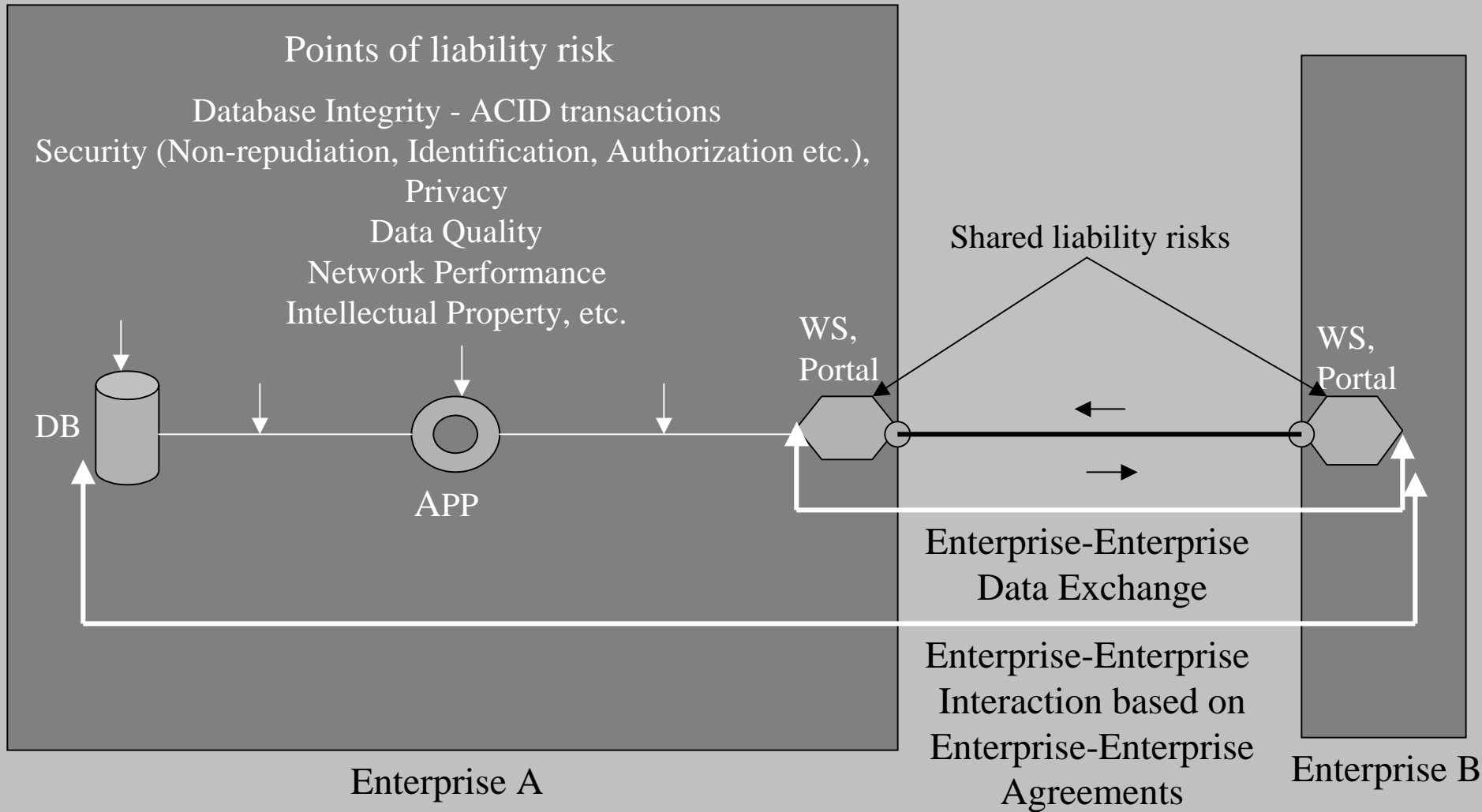
# The Federated System Problem

## Points of Possible Liability



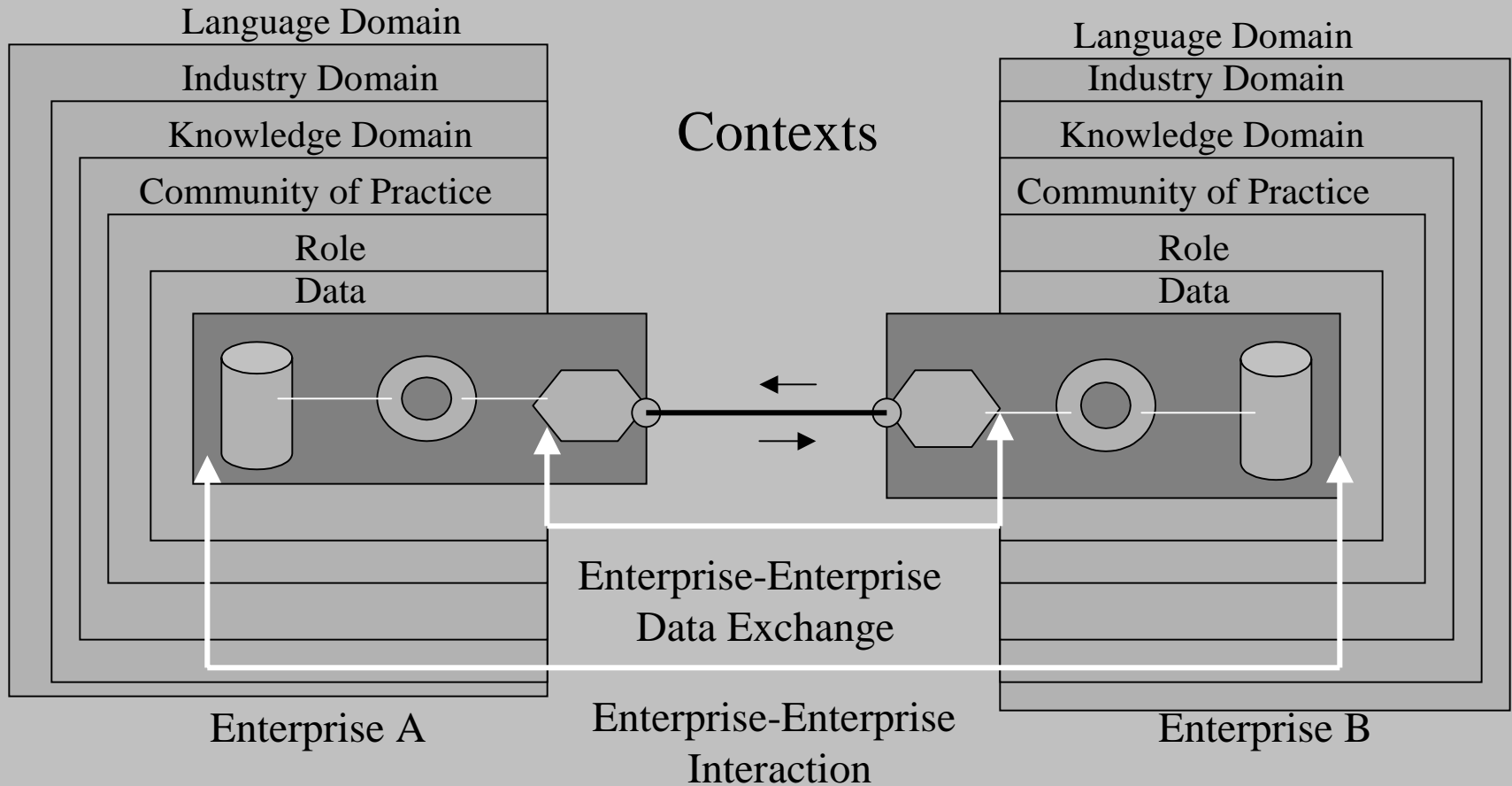
# The Federated System Problem

## Points of Possible Liability



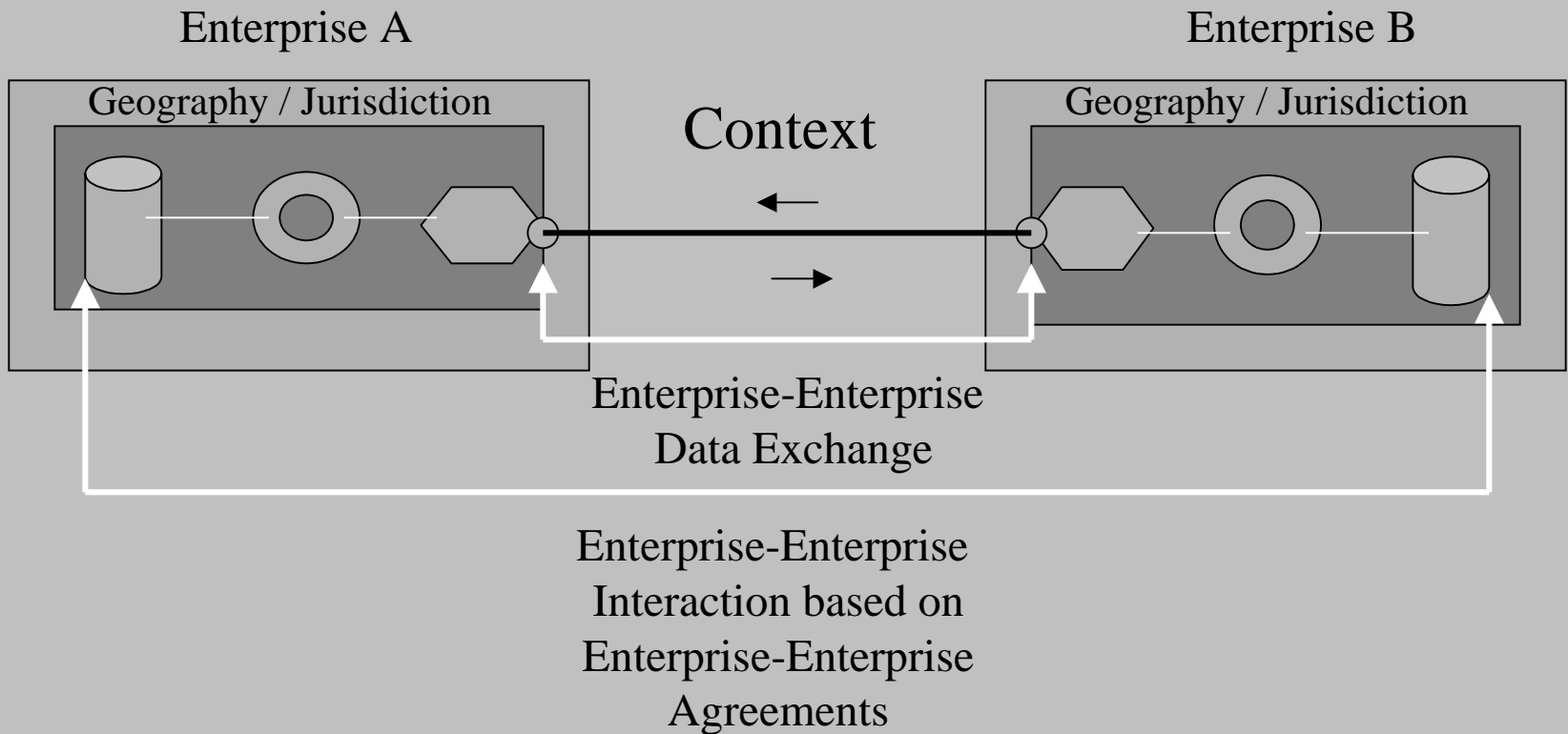
# The Federated System Problem

Semantic Variance (Semantic Shift, Semantic Drift)



# The Federated System Problem

## Jurisdiction



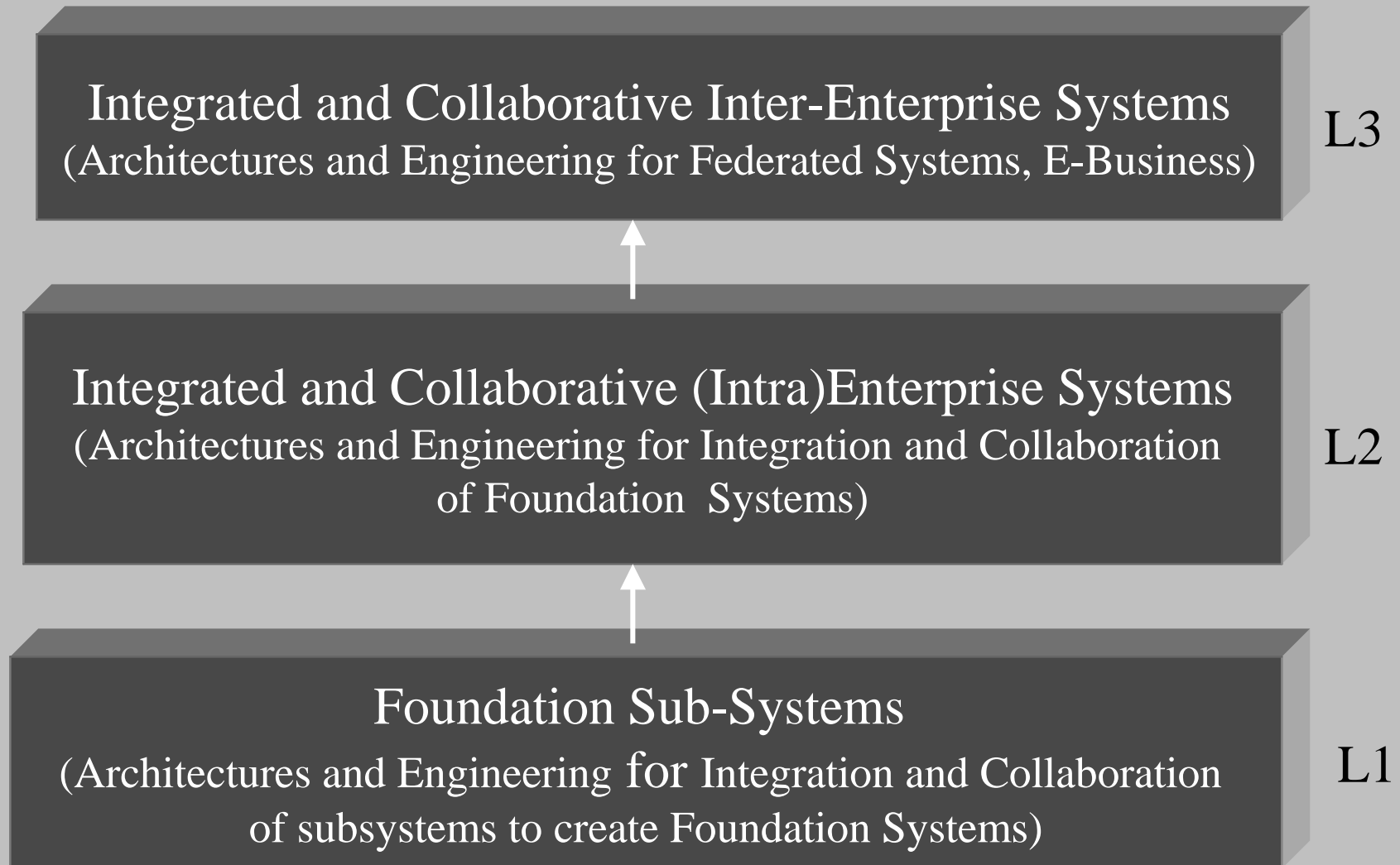
# Context for Analysis and Design

Integrated and Collaborative Enterprises

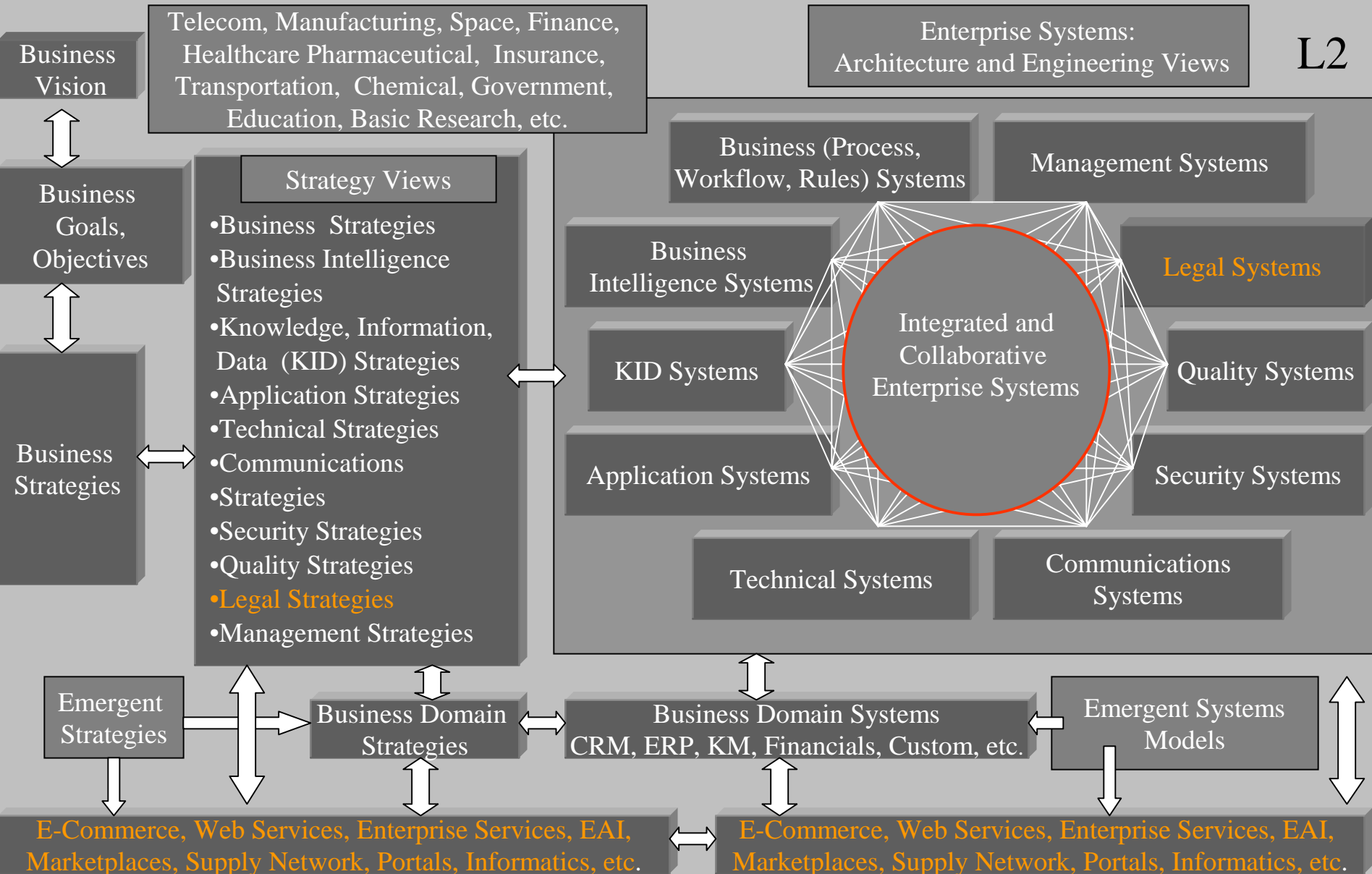
Systems: Architecture and Engineering

(ICESAE<sup>TM</sup>, I-'Say)

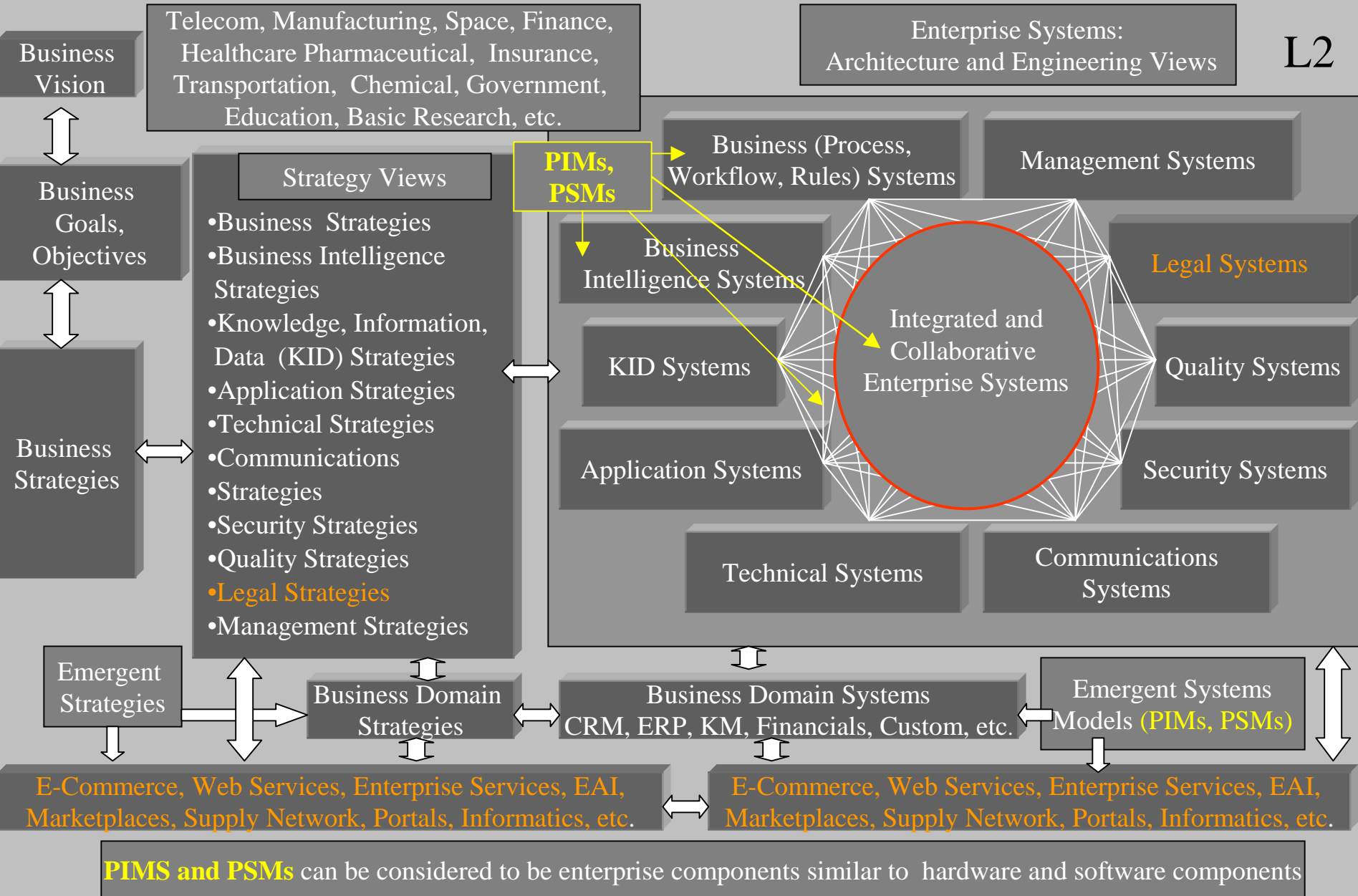
# Abstraction Layers for Integrated and Collaborative Enterprises Systems: Architecture and Engineering (ICESAE™)



# Integrated and Collaborative Intra-Enterprise Systems: Architectures and Engineering



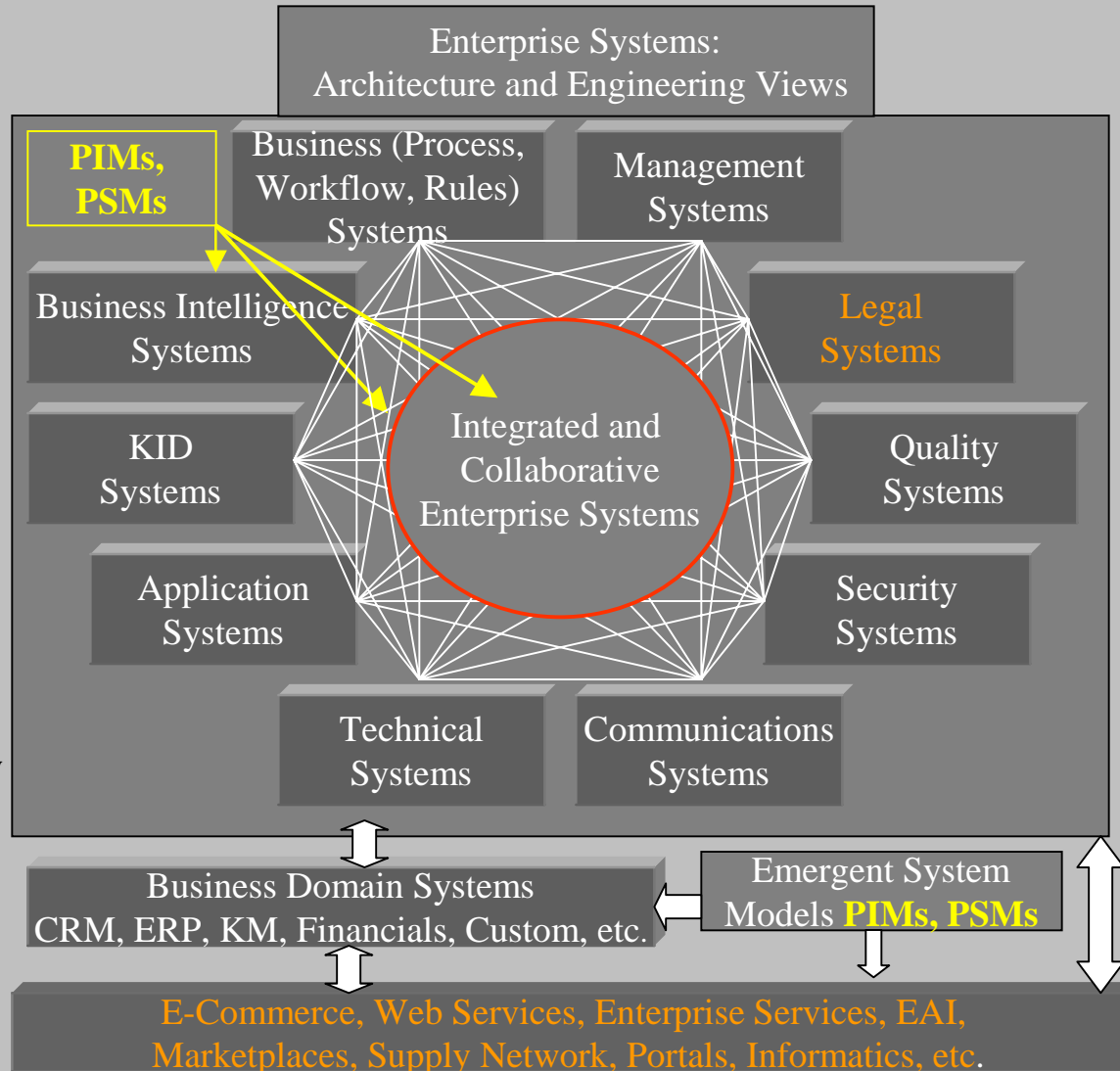
# Integrated and Collaborative Intra-Enterprise Systems: Architectures and Engineering



# Standards-based Integrated and Collaborative Enterprise Systems: Architecture and Engineering

L2

CWM  
 CORBA  
 XMI  
 SPEM  
 Data Parallel  
 Unreliable Multicast  
 Load Balancing  
 EDOC  
 Workflow Process  
 Definition  
 Document Repository  
 Integration  
 Distributed Simulation  
 Registration and Discovery  
 Gene Expression  
 Surveillance  
 Genomic Maps  
 Organizational Structure  
 PIDS

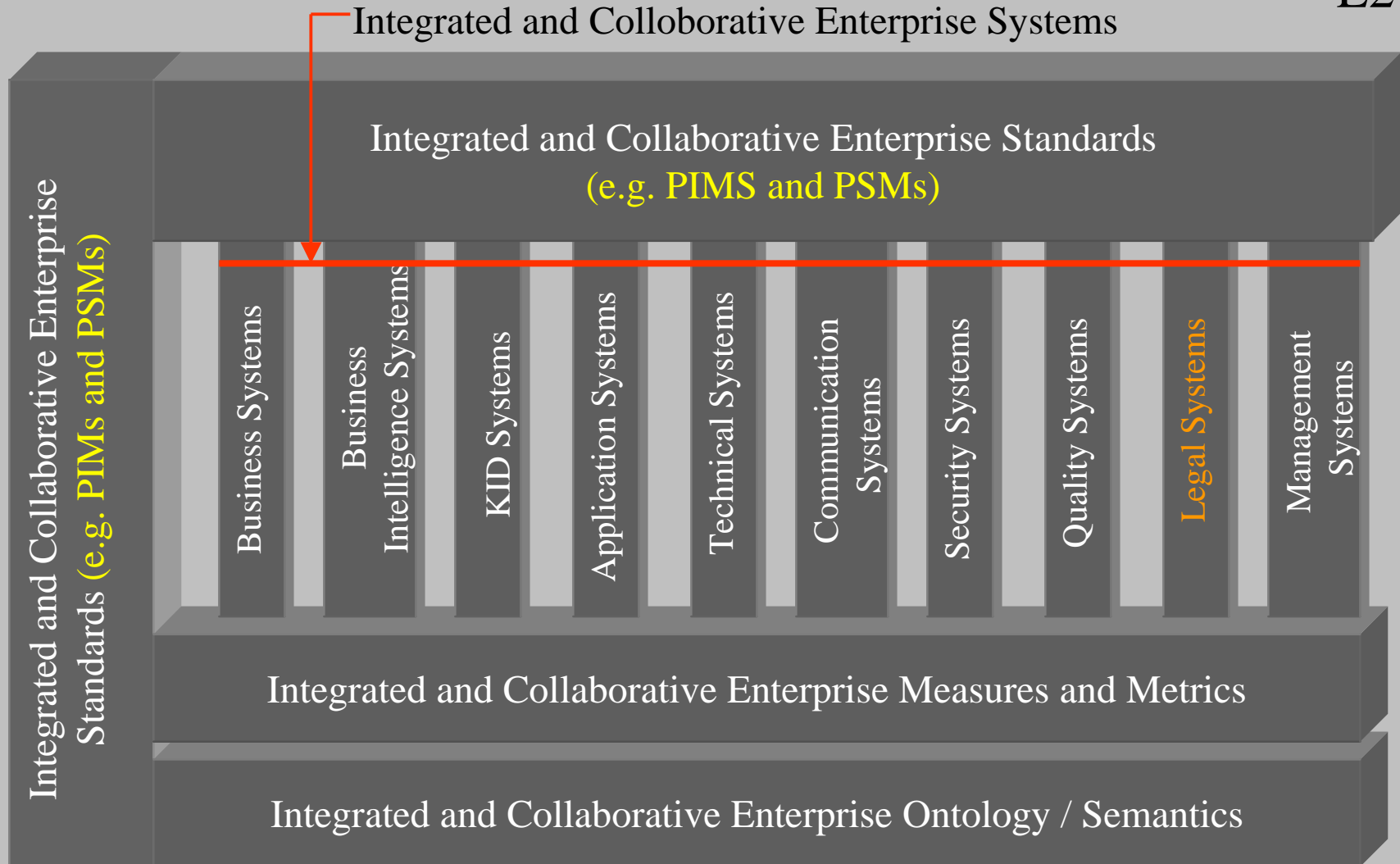


SOAP  
 XML  
 WSDL  
 UDDI  
 ebXML  
 etc

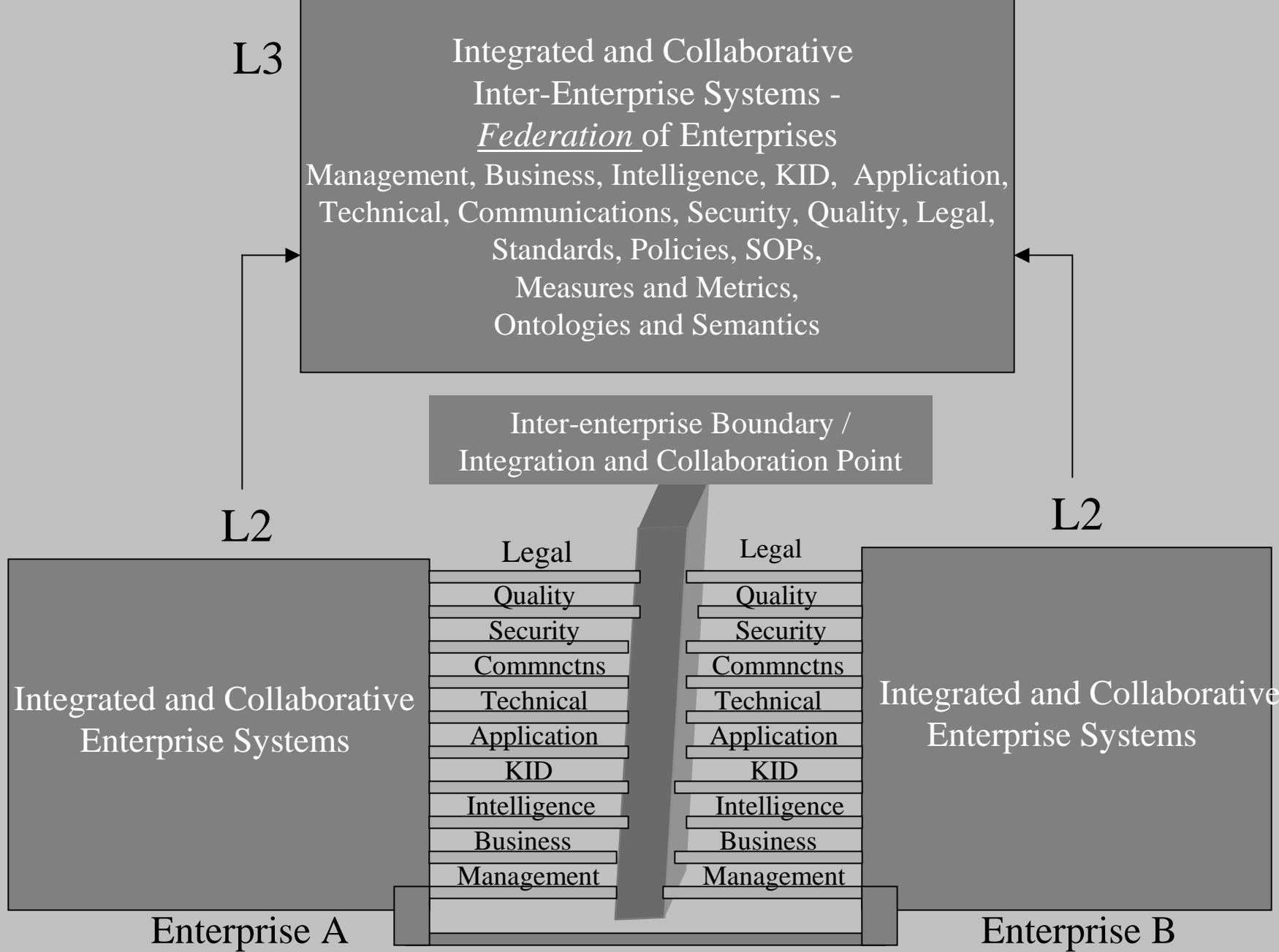
**PIMS and PSMs** can be considered to be enterprise components similar to hardware and software components

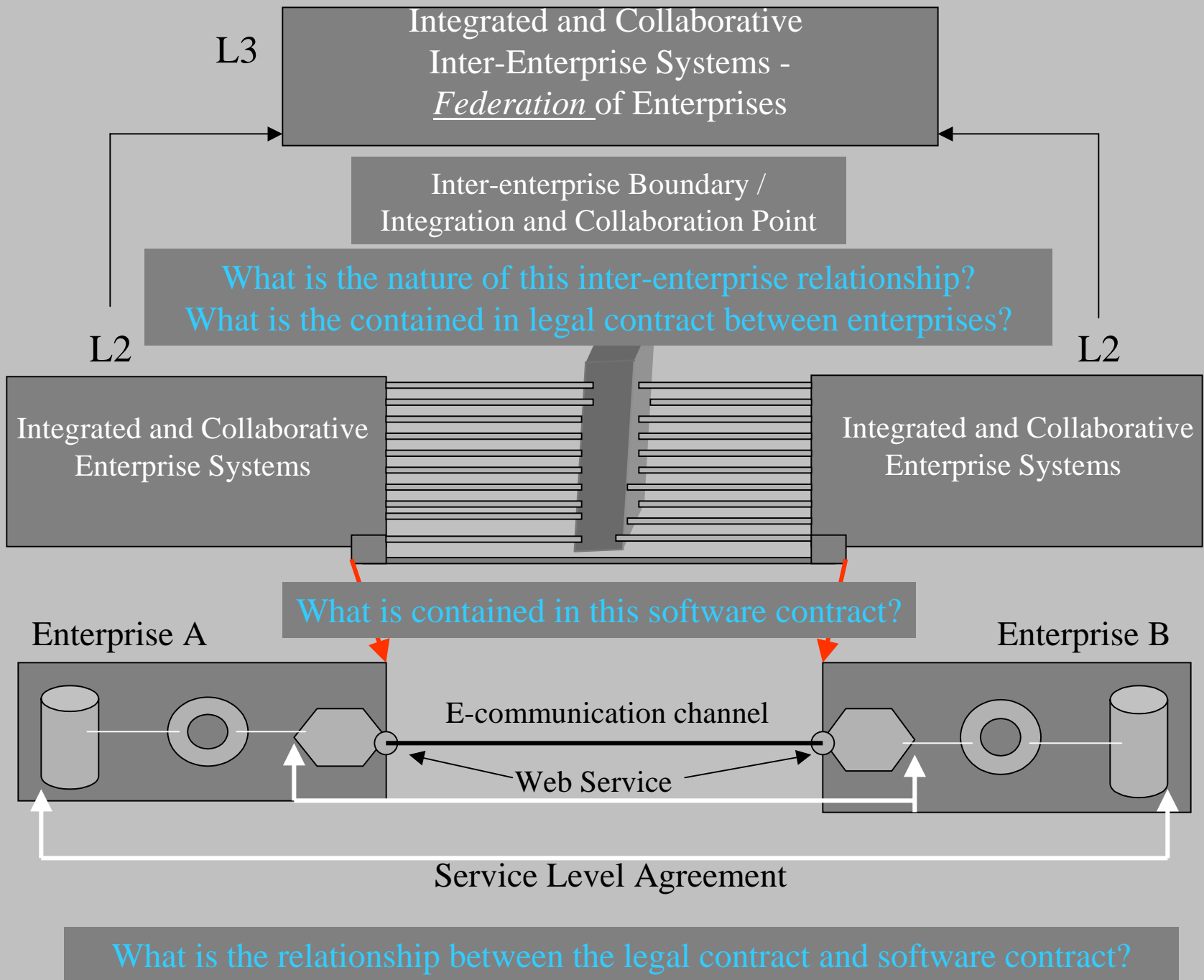
# Systems and Systems Integration are Built on Ontologies / Semantics, and Measures and Metrics

L2









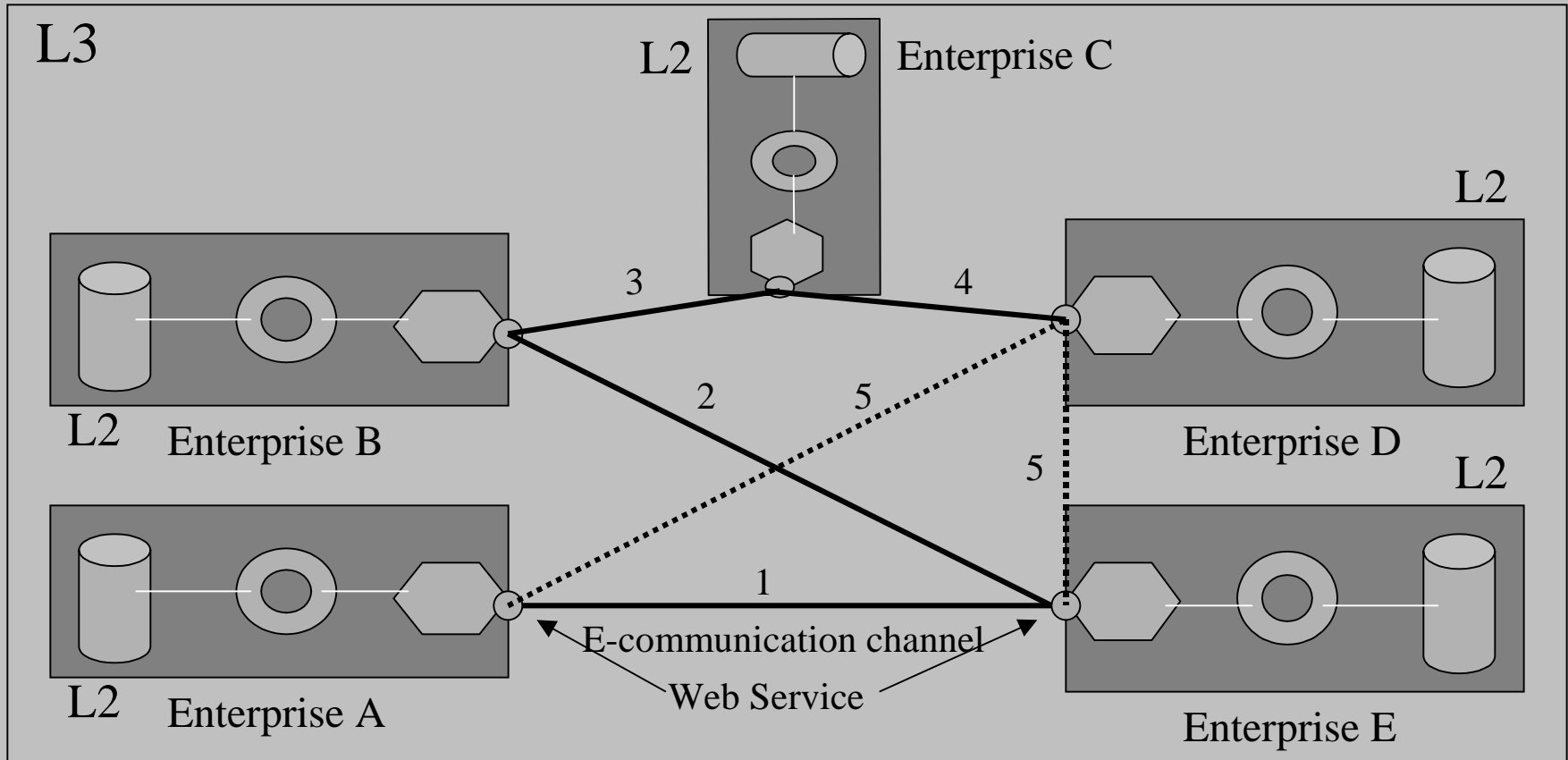
# What is the Nature of the Inter-Enterprise Relationship

- Legal Relationship
- Coupling - What do they, or must they, share?
  - Foundation systems (e.g. KID, applications, security, management, etc.)
- Cohesion - How well should they, do they, share?
  - Foundation Systems (e.g. KID, applications, security, management)
- Coupling and Cohesion affect expectations of one enterprise by the other
- The more “supportive” information (data other than that directly operated on) contained in the software contract, the tighter the coupling

# Integrated and Collaborative Inter-Enterprise Systems - Federation of Enterprises

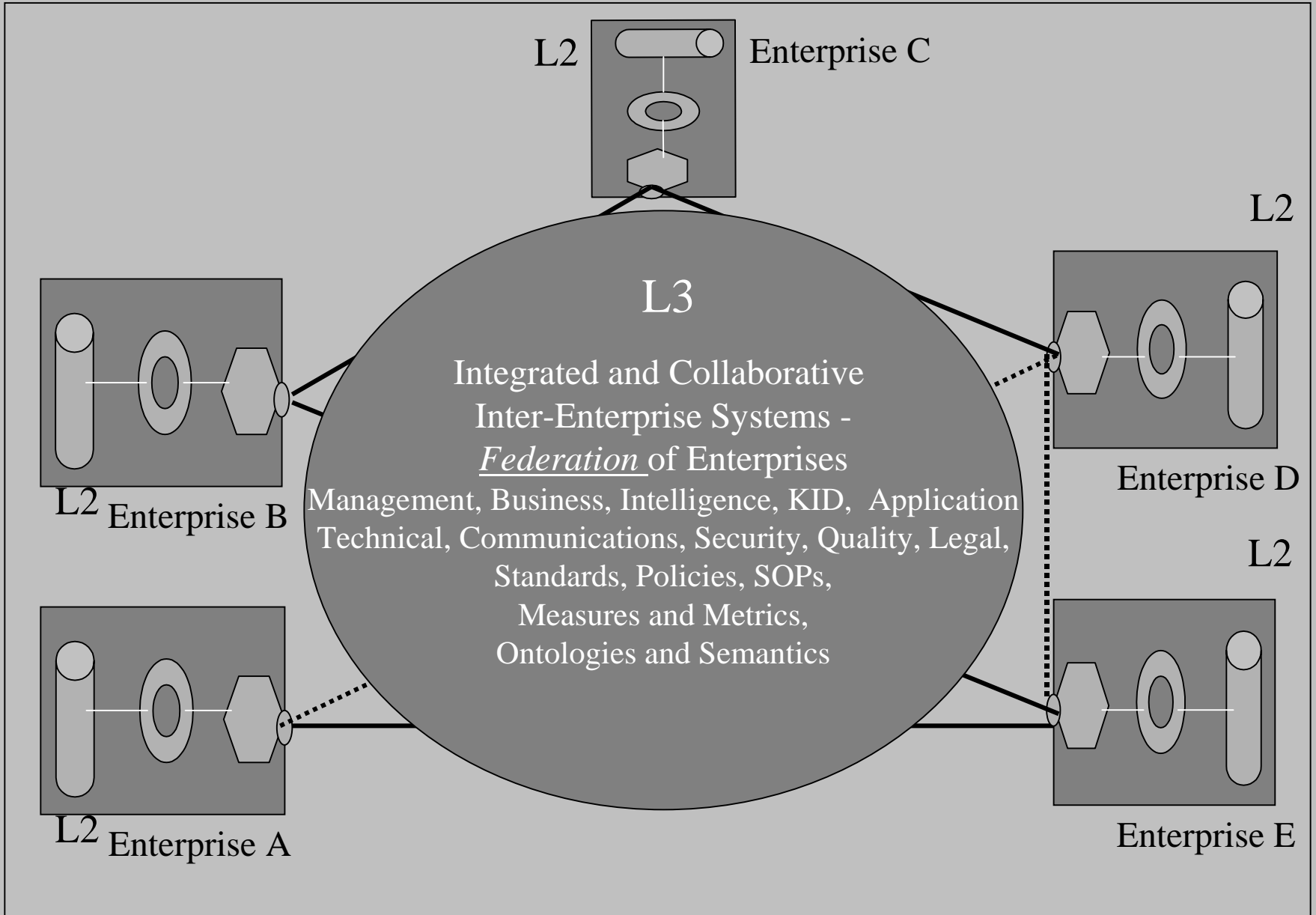
L3

What is the nature of individual inter-enterprise relationships?  
What is the nature of the aggregation of the inter-enterprise relationships?

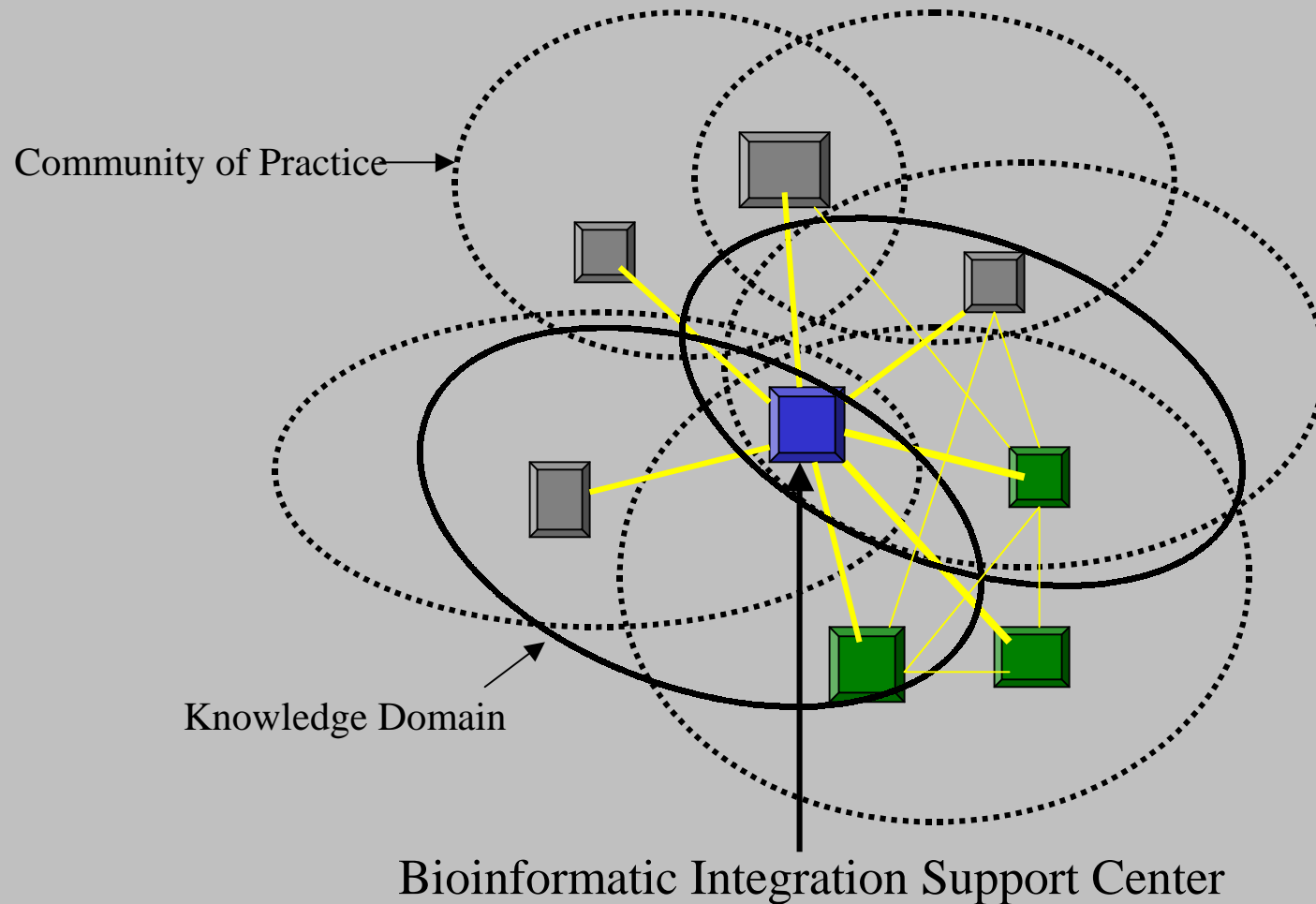


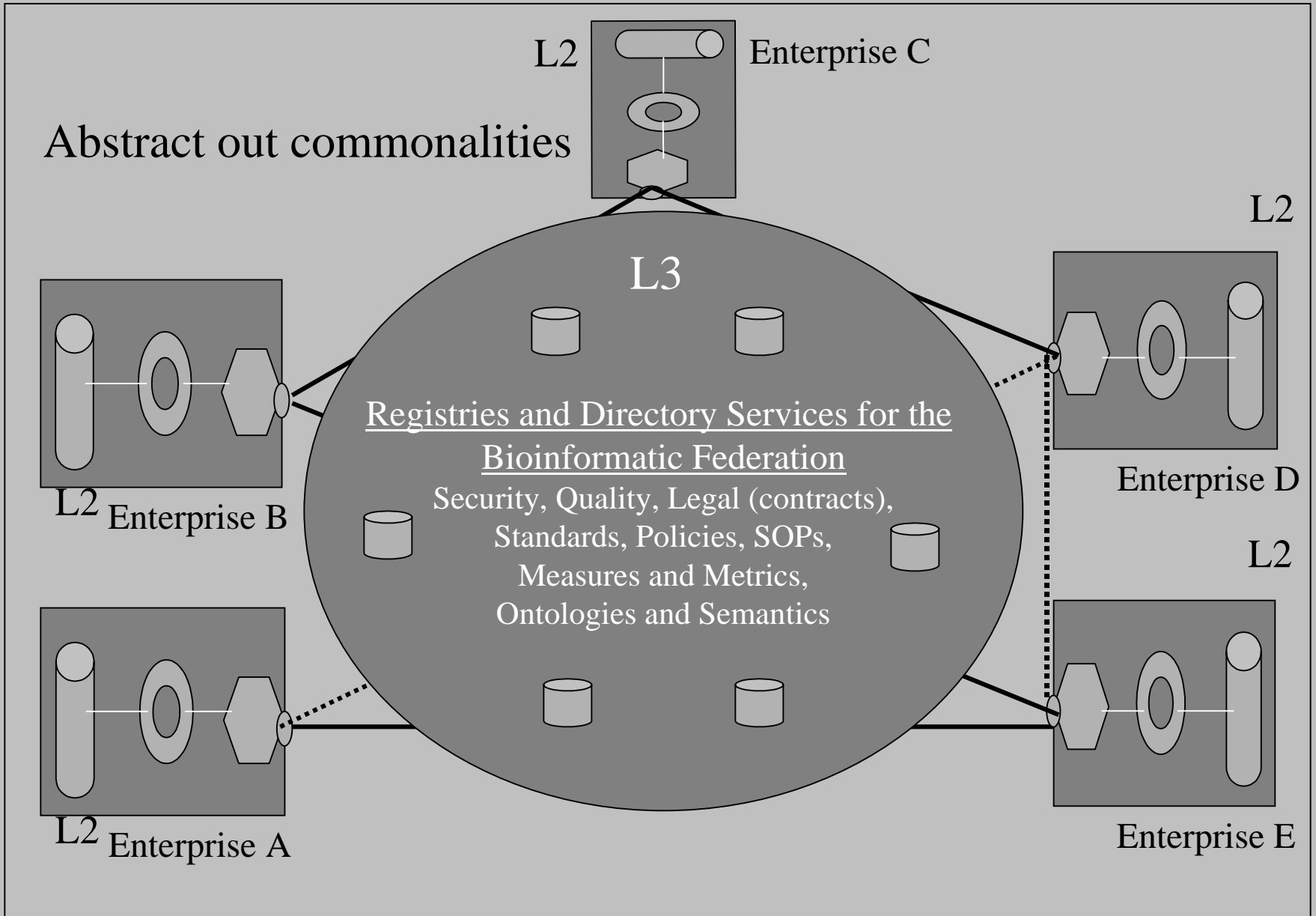
What is contained in the legal contracts?

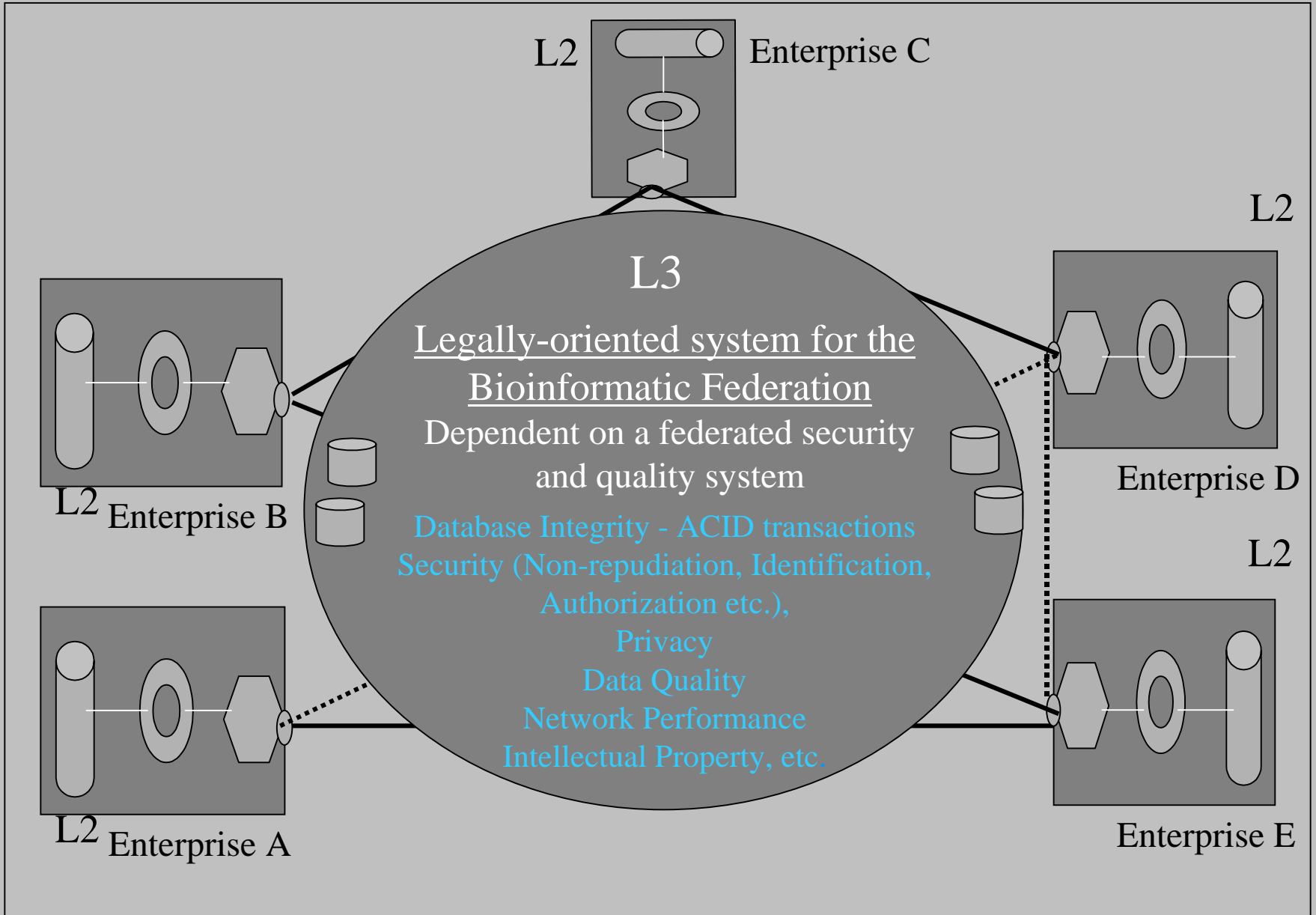
What is contained in each software contract?



# The Federated Bioinformatic System Problem







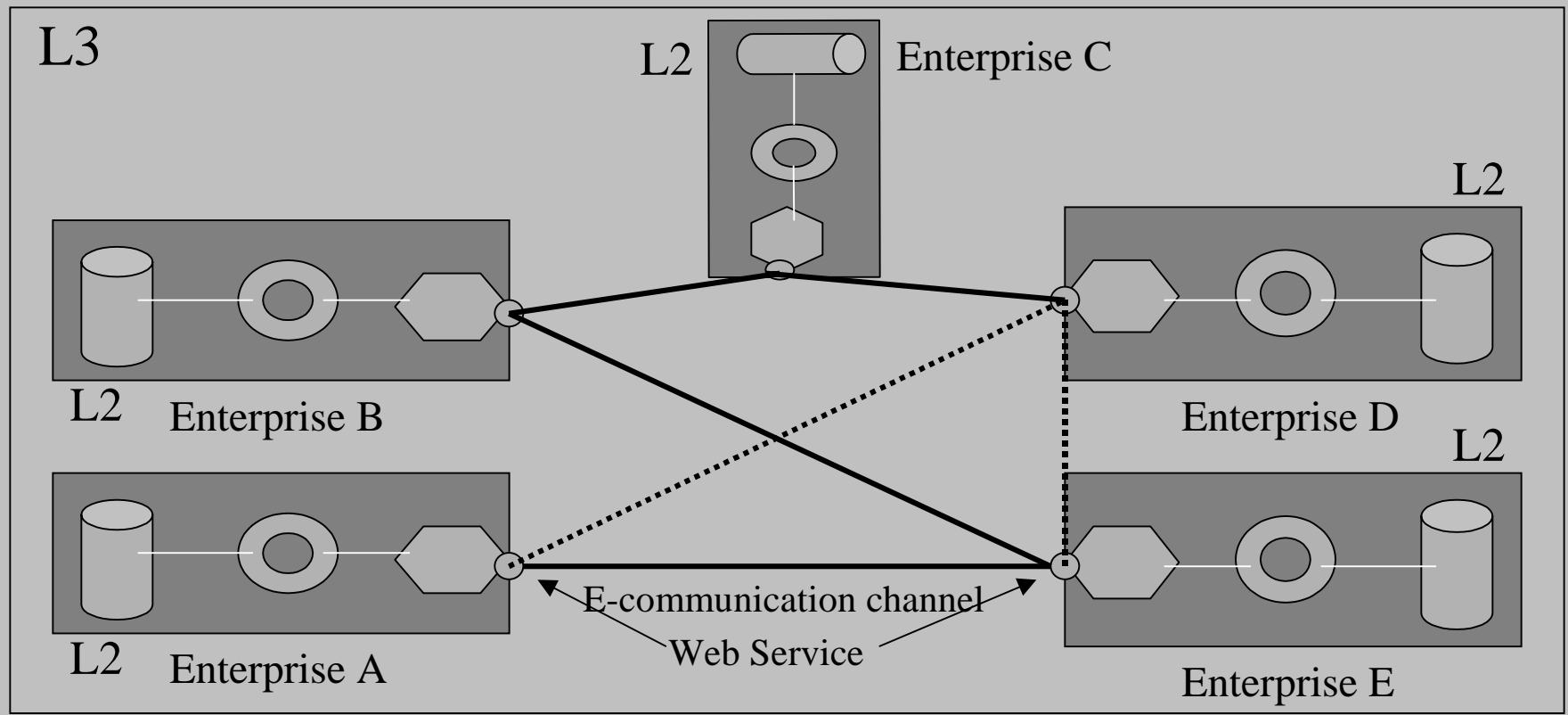
# Federated Bioinformatic Systems Platform

- The Internet Computing Model (object-oriented, service oriented)
- N-Tiered Distributed Systems (object-oriented, service oriented)
- Ontologies, Dictionaries, Thesauri
- Federated Registries (contracts, services, etc.)
- Federated Agents
- Federated Directory Services
- Federated ICESAE systems
  - Legal
  - Management
  - Kid
  - etc.
- The GRID (where appropriate)

# Integrated and Collaborative Inter-Enterprise Systems -Federation of Enterprises

## Applicable Standards for Bioinformatics Federation

EDOC, Document Repository Integration, Registration and Discovery, Gene Expression, Genomic Maps, Organizational Structure, PIDS, CWM, XMI, SOAP, XML, WSDF, WSFL, UDDI, ebXML, etc.

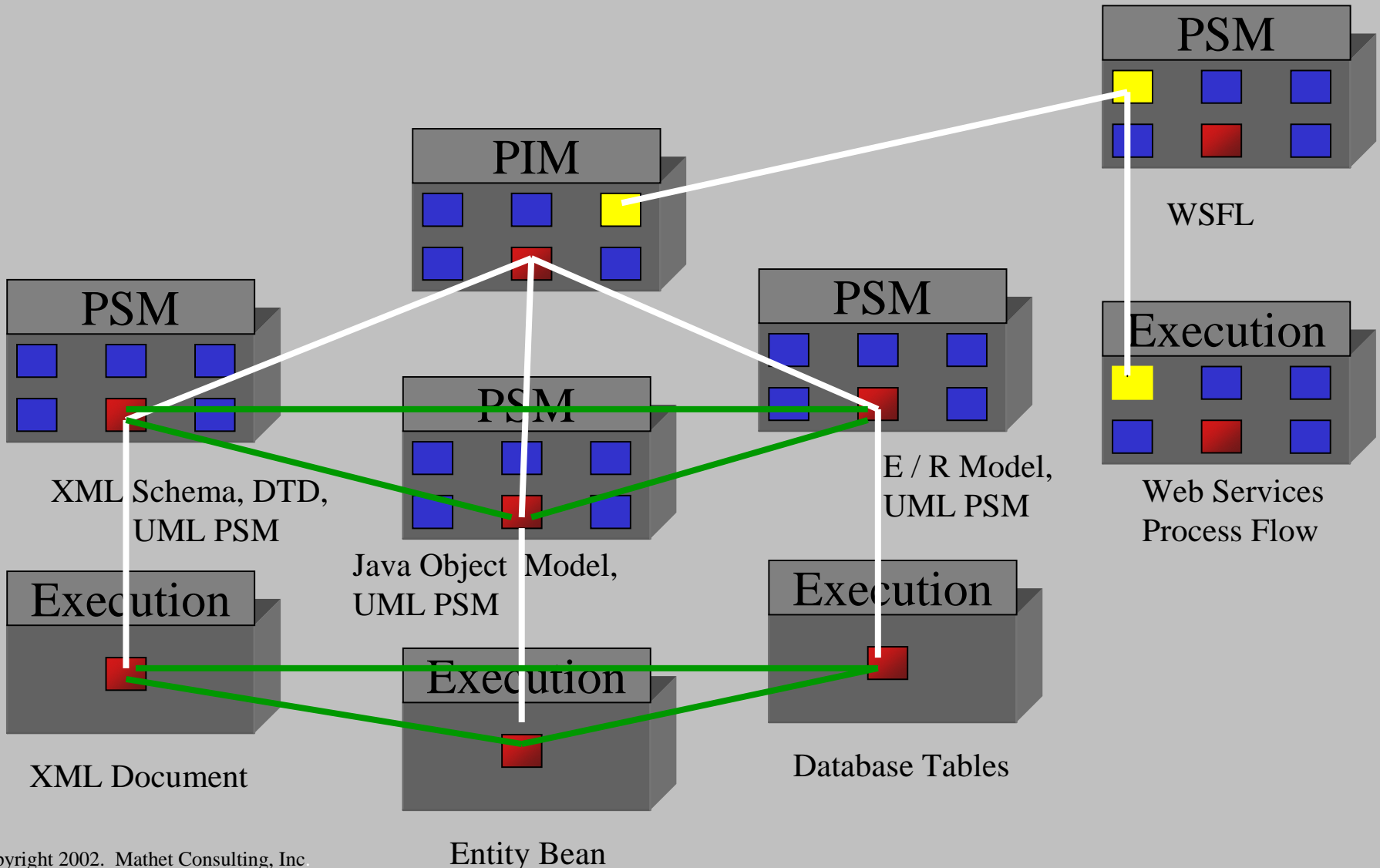


Architecting and Engineering  
Federated Systems for E-  
Business - a Legal View  
ICESAE and MDA

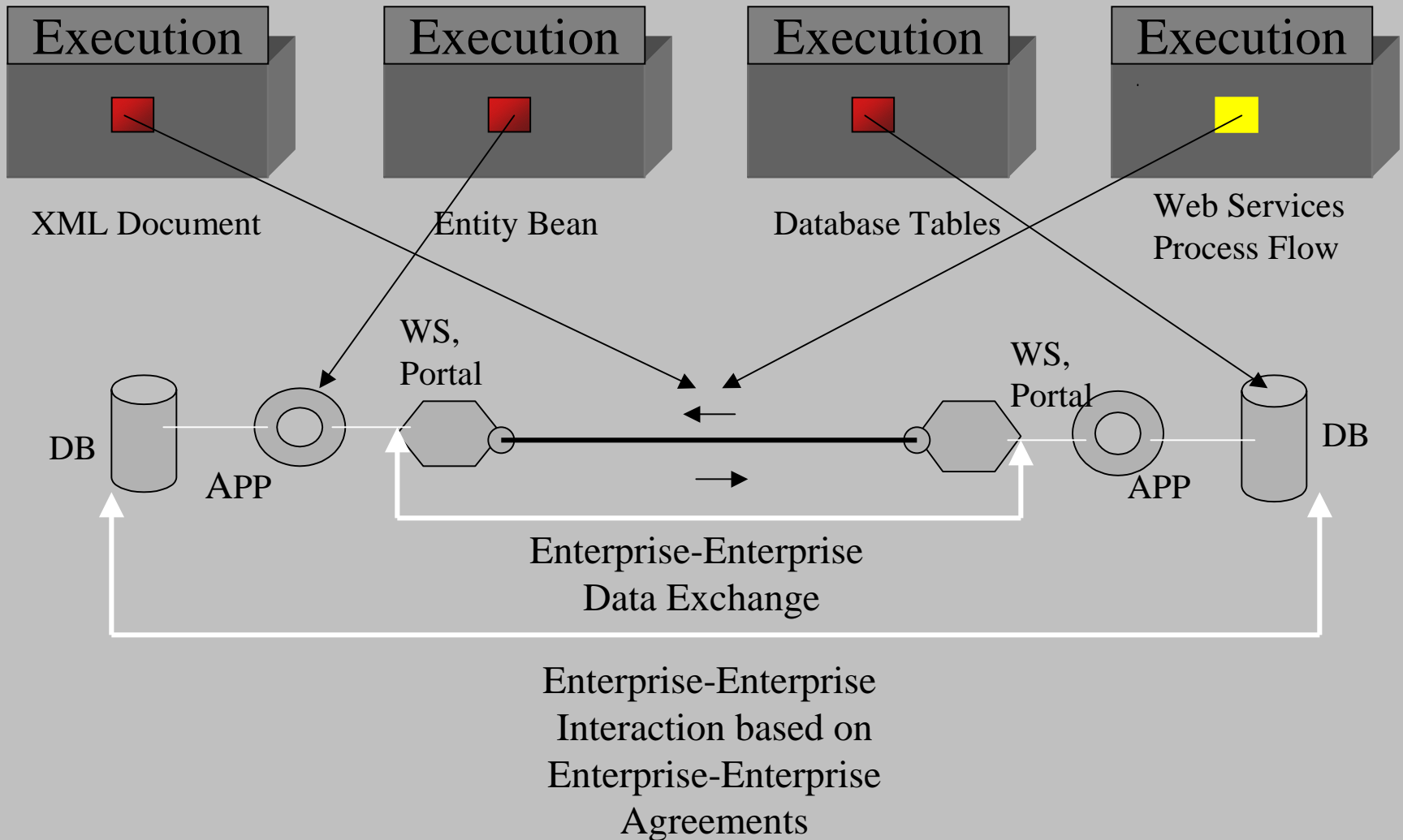
# Requirements for a Legal System of the Federated System (Partial List)

- Based on Legal requirements of individual enterprises, relationships between enterprises, and the federation as a whole
- Must have contract management (quality of service agreements, trade agreements)
- Must be able to observe federation behavior and compare to contracts: gather, collate, flag, report based upon predetermined metrics - gather evidence.
  - Determine nature of dispute (e.g. security-database access)
  - Determine the parties involved
  - Determine who owns what
- Must be able to mediate “e-disputes” - help disputing parties negotiate a resolution. Must be able to report on mediation of “e-disputes”
- Must be able to arbitrate “e-disputes” - make judgements. Must be able to report on arbitration of “e-disputes”.

# UML and Model Driven Architecture for Federated Systems - L3 Level



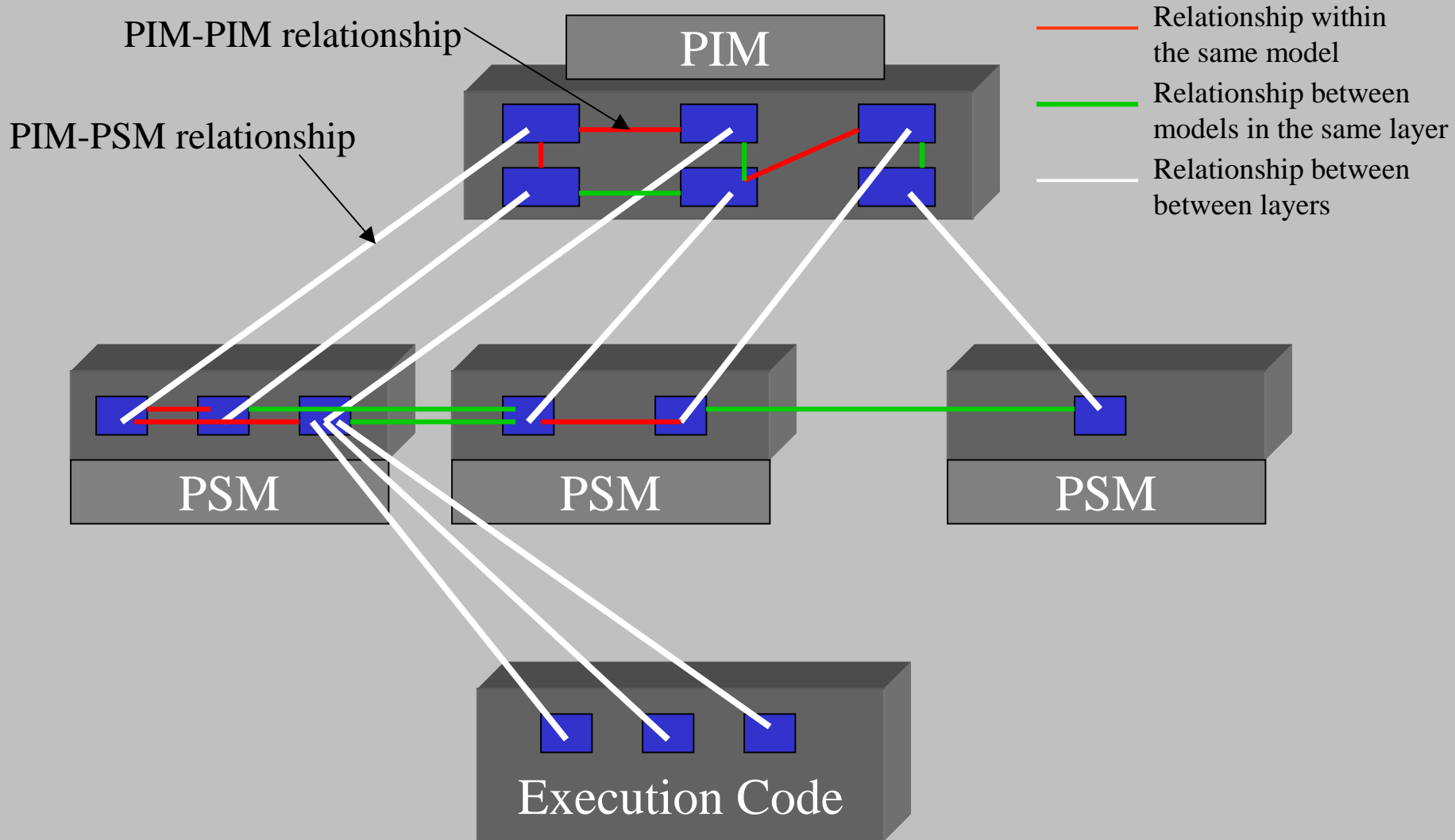
# UML and Model Driven Architecture for Federated Systems - L3 Level



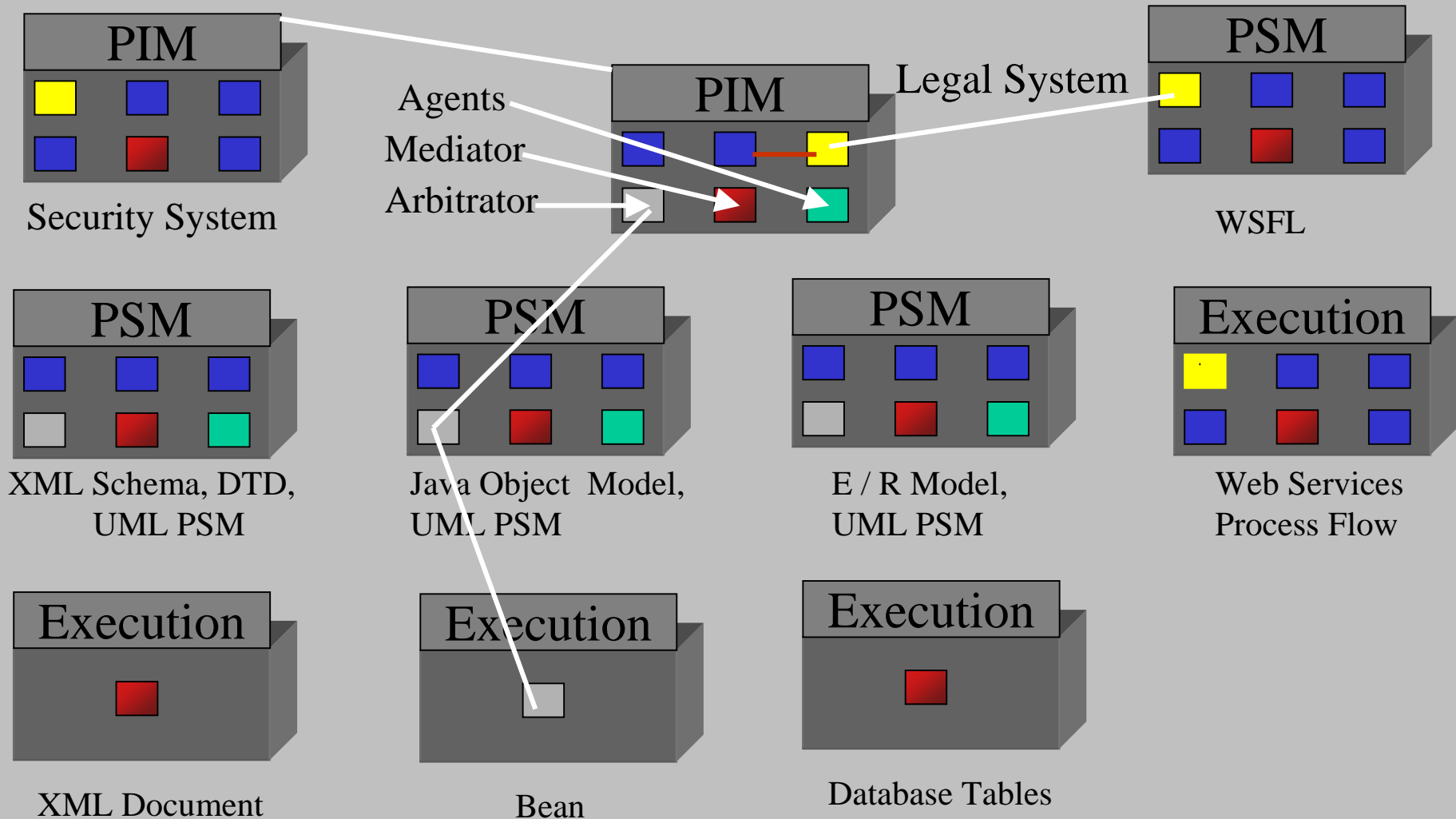
# Properties and Characteristics of a Legal System of the Federated System (Partial List)

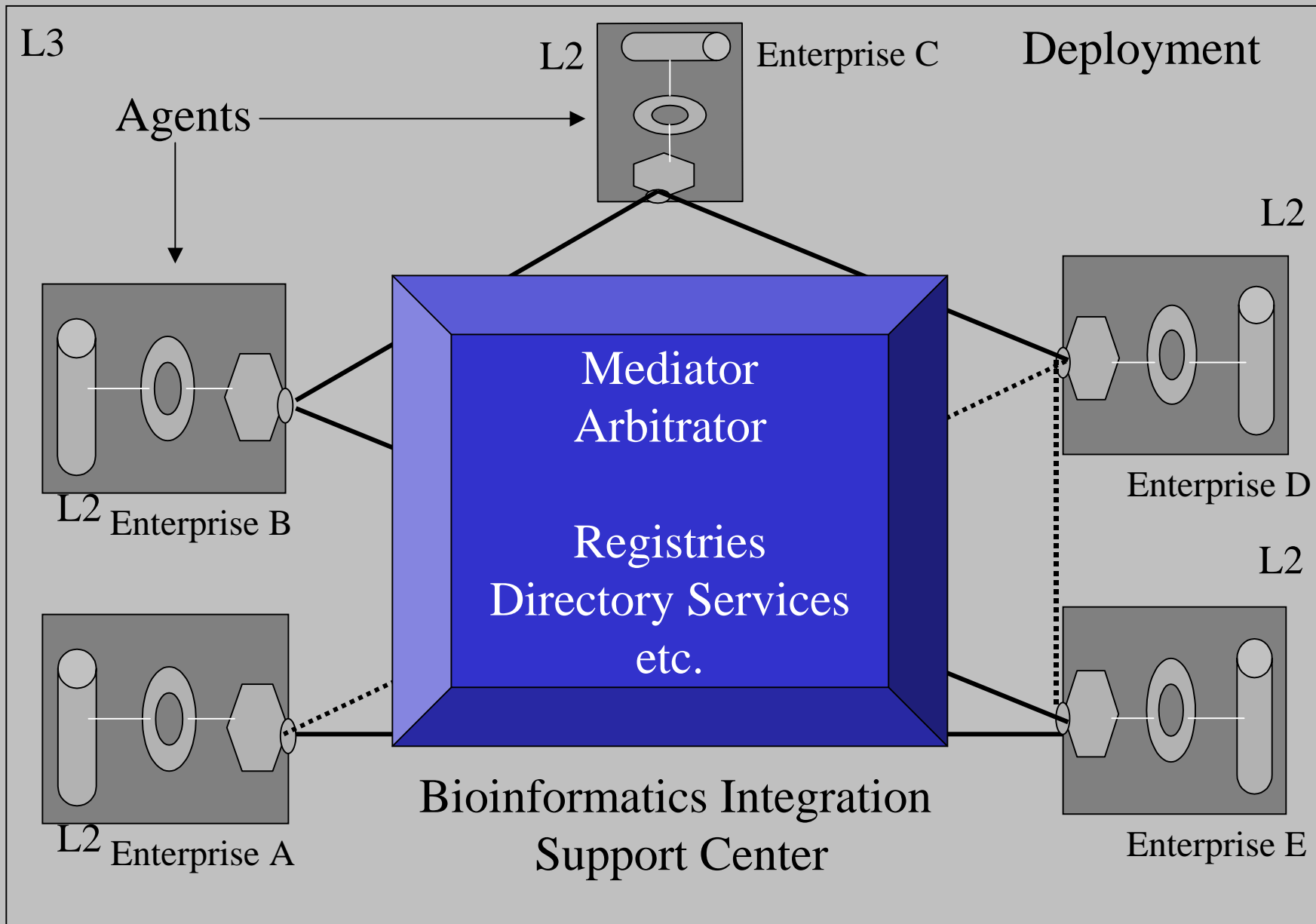
- The Legal System for a federation exists at the L3 abstraction layer. It is a foundation system for the federation.
- It is “owned” by the federation
- Its boundaries are the boundaries of the federation - the enterprises that make up the federation
- It utilizes ontologies, dictionaries and thesauri as references in “e-disputes”
- It utilizes measures and metrics for “e-disputes” - observation, mitigation, and arbitration

# UML and Model Driven Architecture for Federated Systems - L3 Level



# UML and Model Driven Architecture for Federated Systems - L3 Level High-level View of Legal System





# Contact Information

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