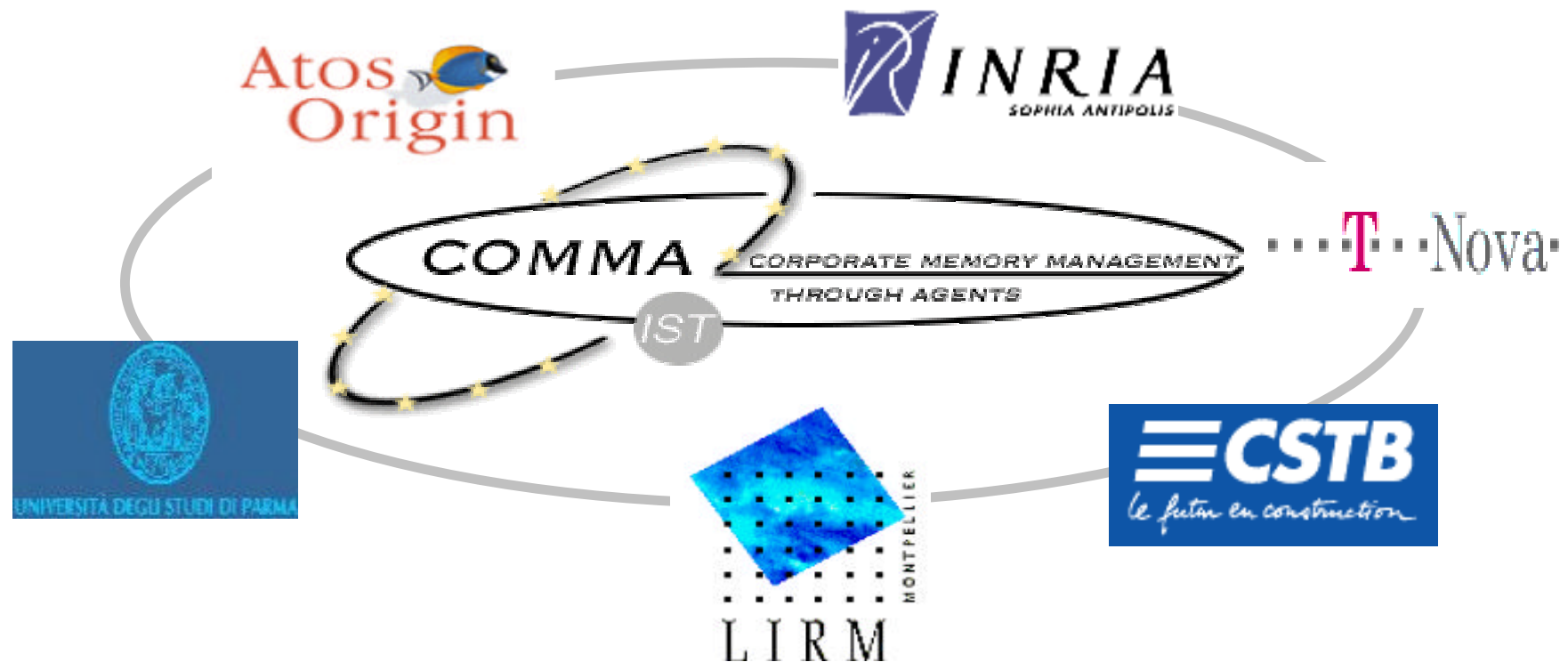


# COMMA in a Nutshell



## ◆ **Knowledge and information management:**

- **Needs:** improve reaction time & address turnover
  - Persistent memory: store and/or index knowledge
  - Nervous system: capture and diffuse knowledge
- **O.M.:** an explicit and persistent representation and/or indexing of knowledge in an organization, in order to facilitate its access and reuse by members of the organization, for their individual and collective tasks.
- **Current trend:** reuse internet and web technologies to build intranets and intrawebs
  - Same advantages: standardised technology, browser unique access means, distributed architecture, etc.
  - Same drawbacks: human-understandable but only machine readable; problem of retrieval, automation,...

## ◆ **Corporate Memory Management through Agents:**

- Assist new employee integration
- Support technology monitoring activities

- ◆ **Dynamically integrating heterogeneous sources of information:** Manifold [Kirk *et al.*, 1995] ; InfoSleuth [Nodine *et al.*, 1999] ; InfoMaster [Genesereth *et al.*, 1997] ; Carnot [Collet *et al.*, 1991] ; RETSINA [Decker and Sycara, 1997] ; SIMS [Arens *et al.*, 1996] ; OBSERVER [Mena *et al.*, 1996]
- ◆ **Digital libraries:** SAIRE [Odubiyi *et al.*, 1997] UMDL [Weinstein *et al.*, 1999]
- ◆ **Knowledge management:**
  - Collaborative gathering, filtering and profiling: CASMIR [Berney and Ferneley, 1999]; Ricochet [Bothorel and Thomas, 1999]
  - Mobile access to memory and domain model for classification: KnowWeb [Dzbor *et al.*, 2000]
  - Taxonomy, profiling and push: RICA [Aguirre *et al.*, 2000]
  - Ontology and corporate memory: FRODO [Van Elst and Abecker, 2001]

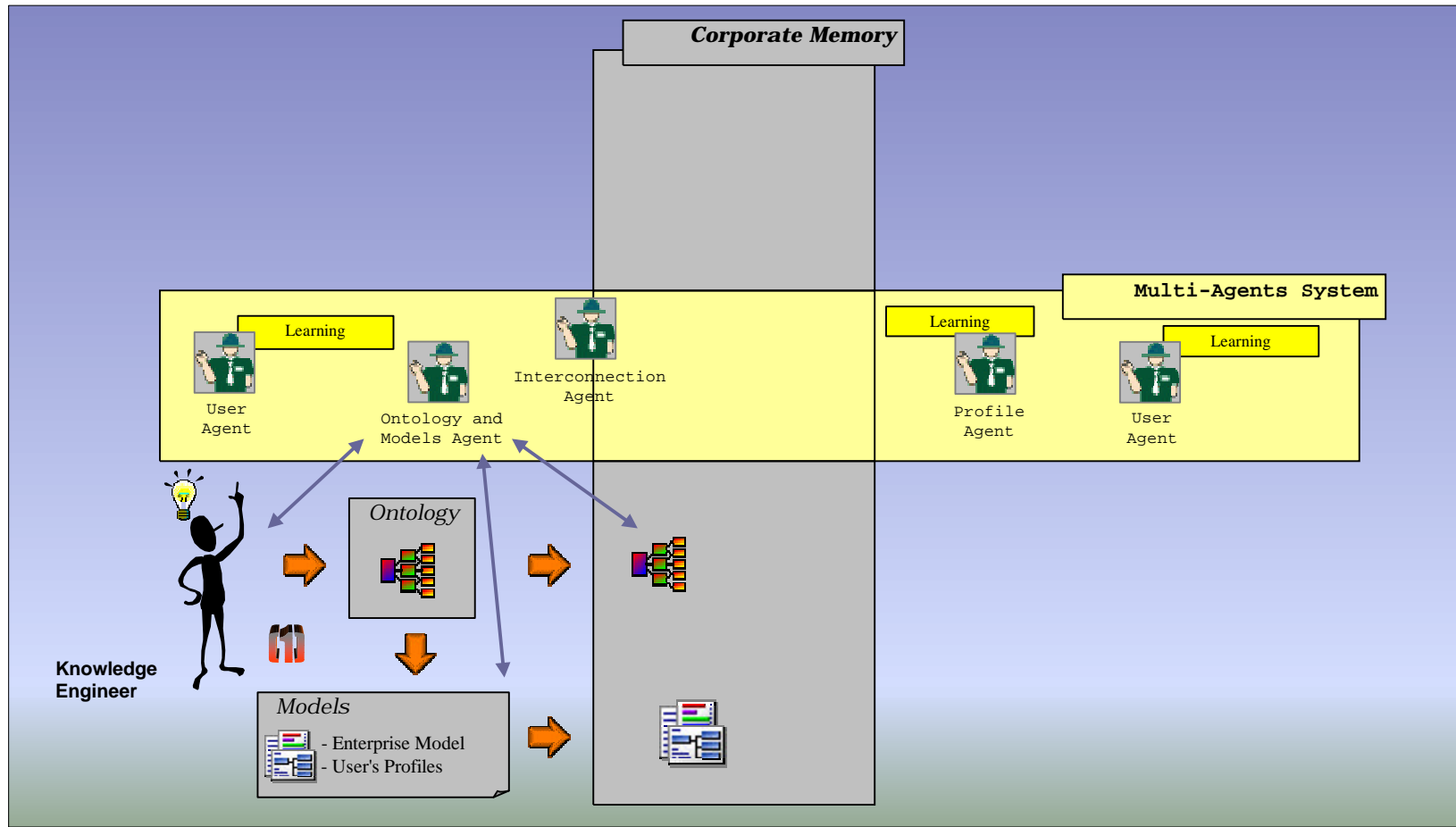
## ◆ In CoMMA:

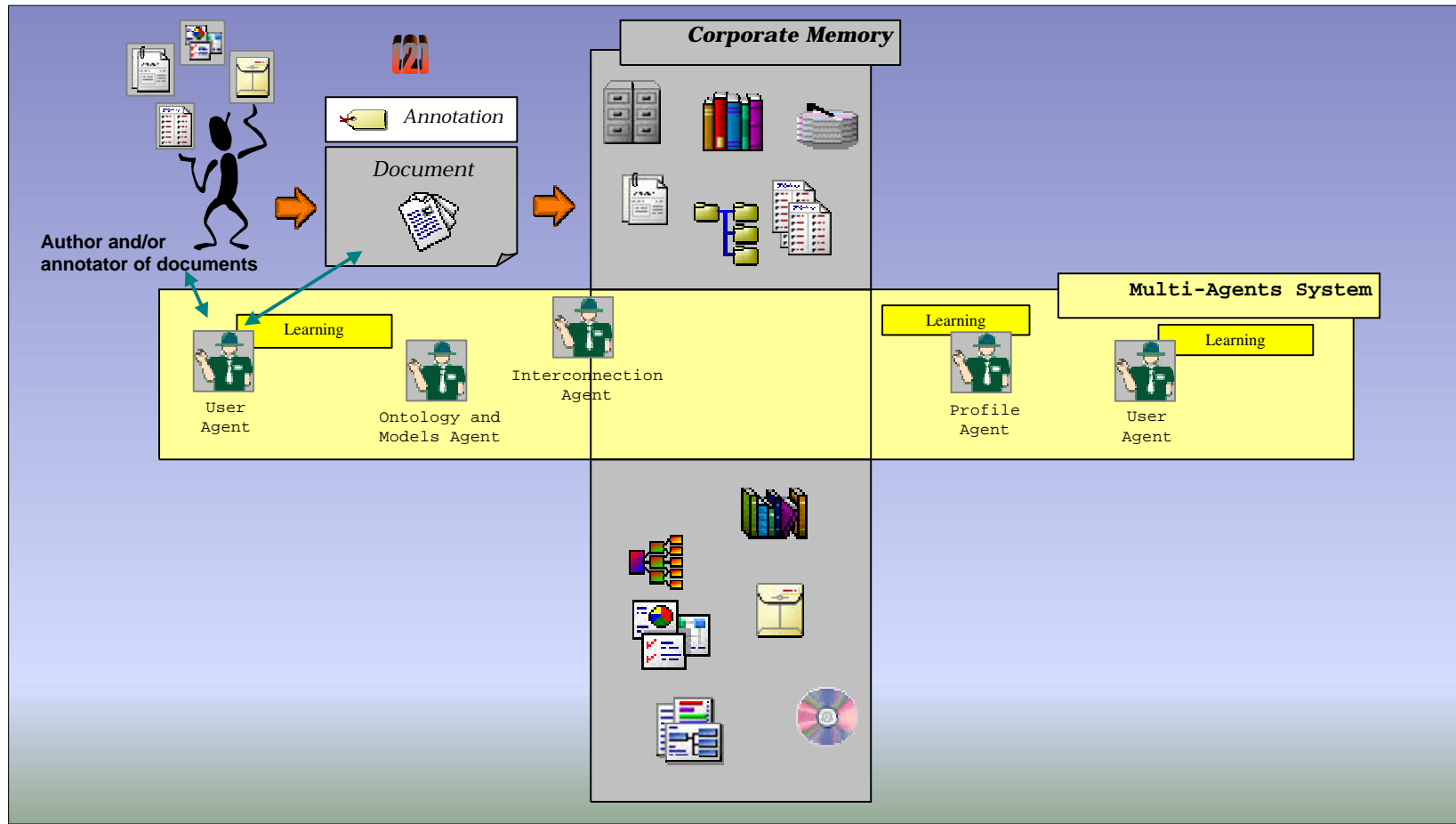
- Corporate memories are *heterogeneous and distributed information landscapes*
- Stakeholders are an *heterogeneous and distributed population*
- Exploitation of CM involves *heterogeneous and distributed tasks*

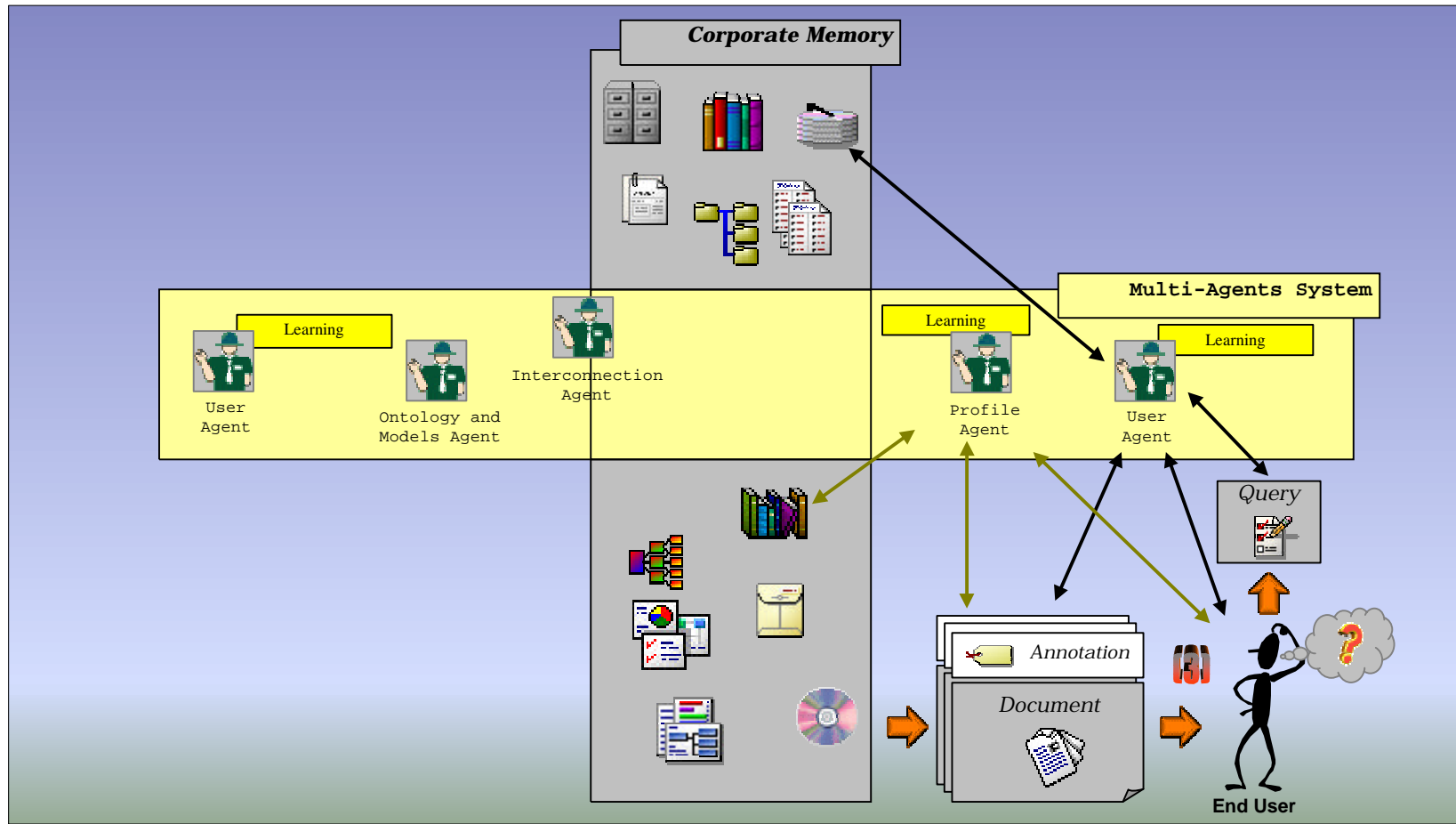
## ◆ Choices:

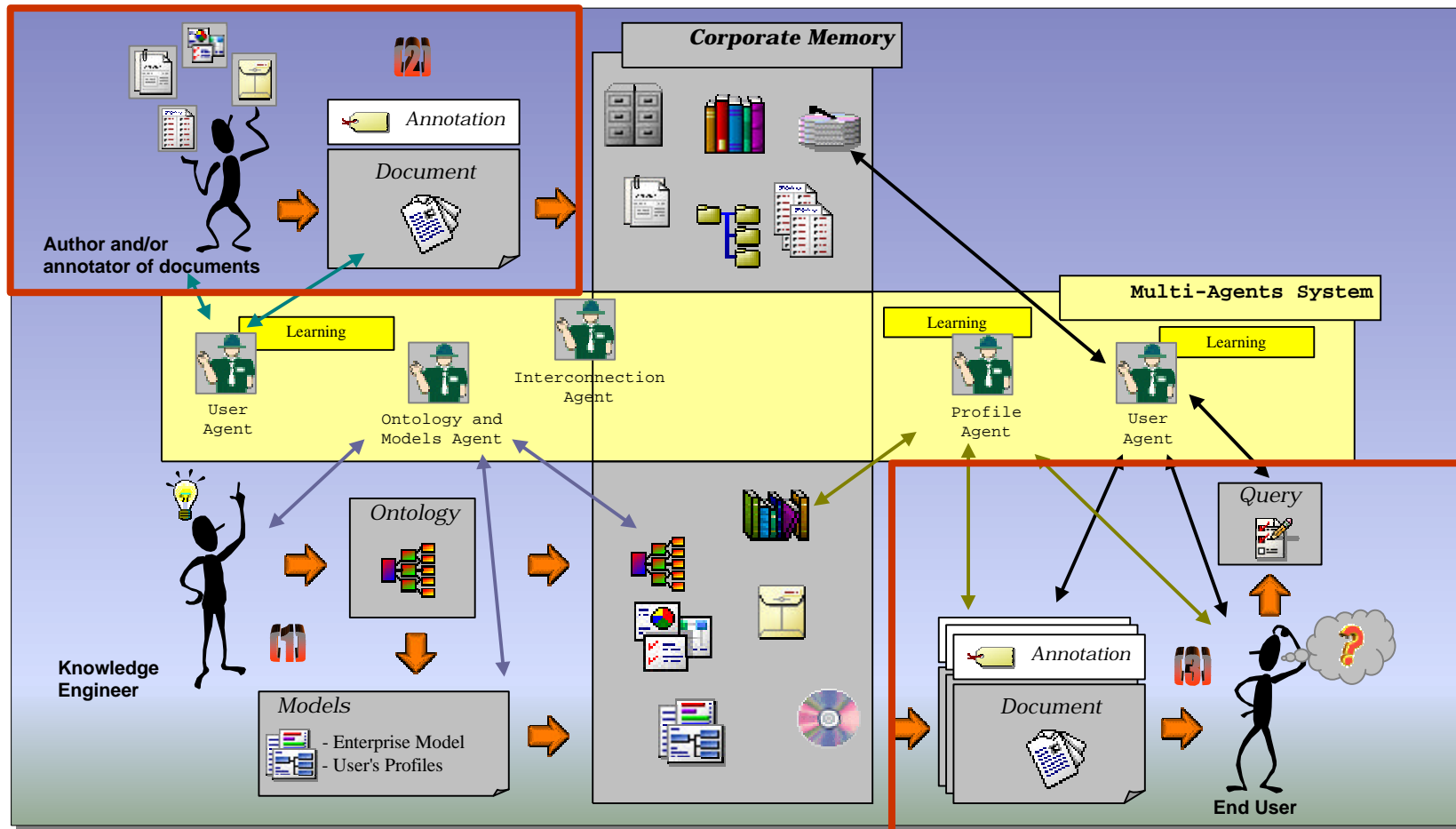
<u>Materialization CM</u>	<u>Exploitation CM</u>
<b>XML:</b> Standard, Structure, Extensible, Validate, Transform	<b>Multi-Agent System:</b> Modularity, Distributed, Collaboration
<b>RDF:</b> Annotation, Schemas	<b>Machine Learning:</b> Adaptation, Emergence
Corporate Memory	Management through Agents

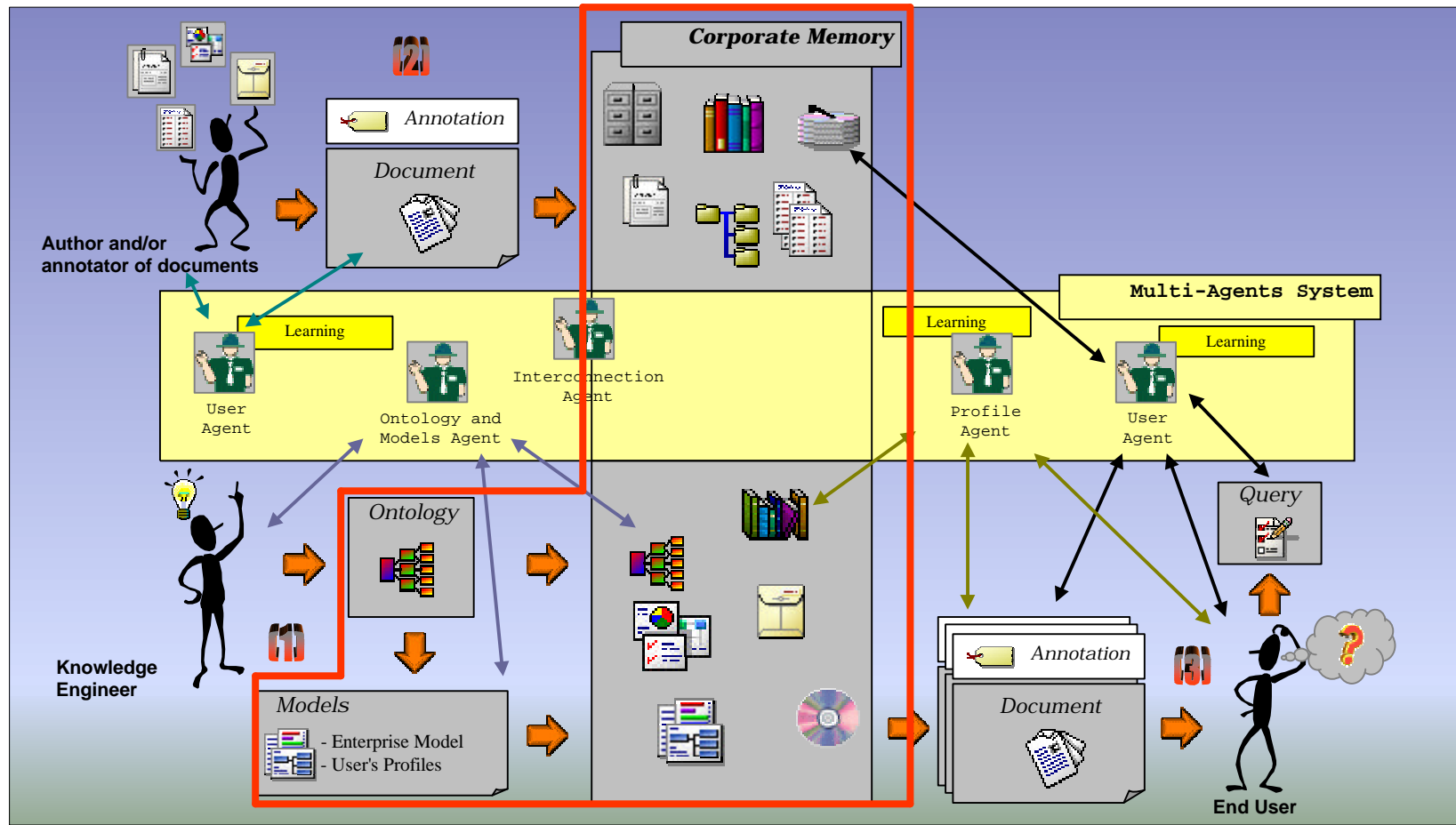




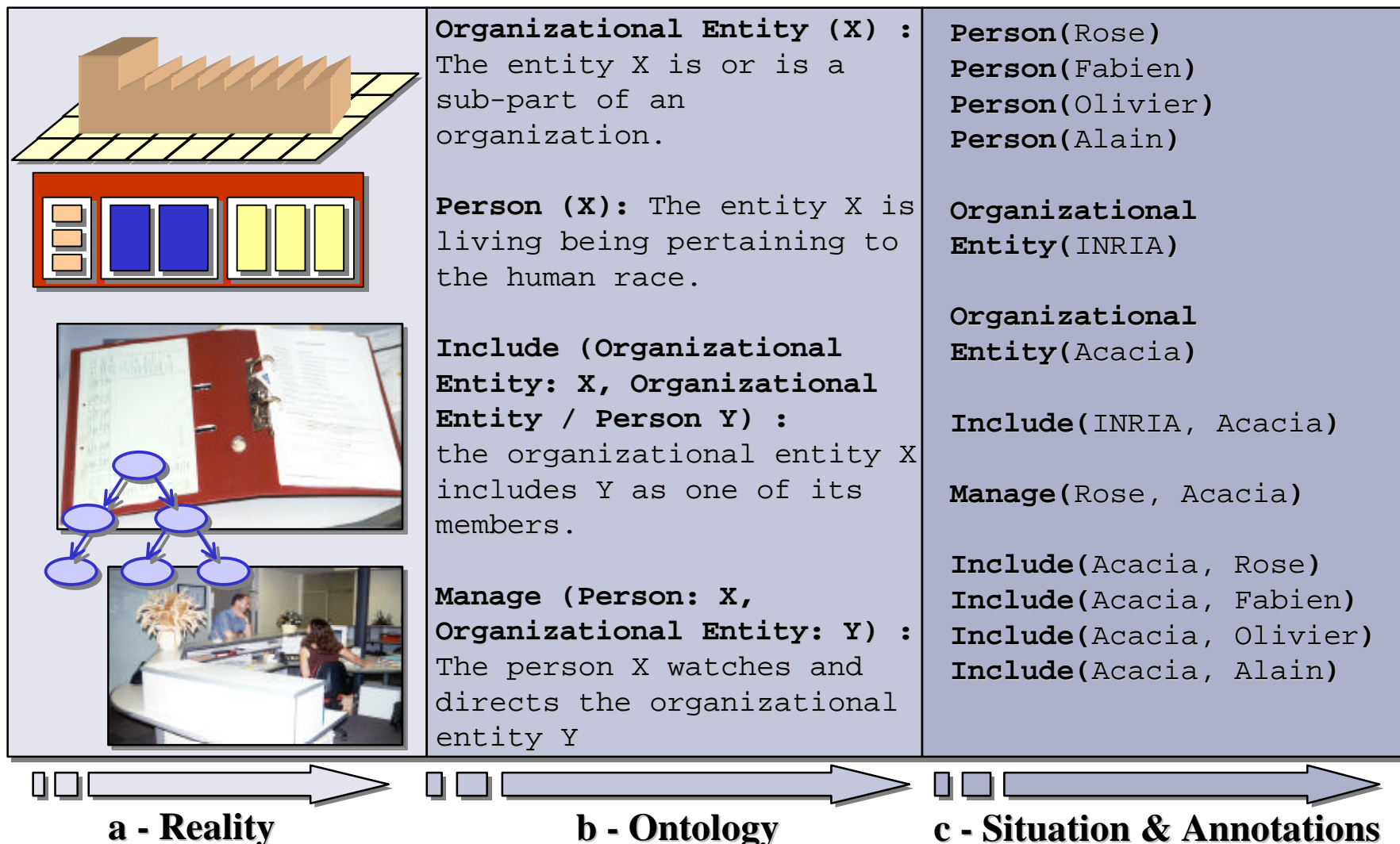






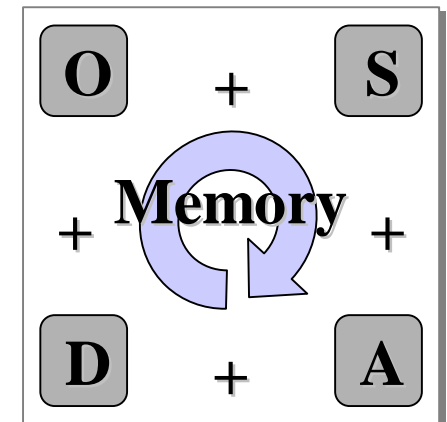


- ♦ **Ontology**: explicit partial account of concepts used in the corporate memory management scenarios and their relations

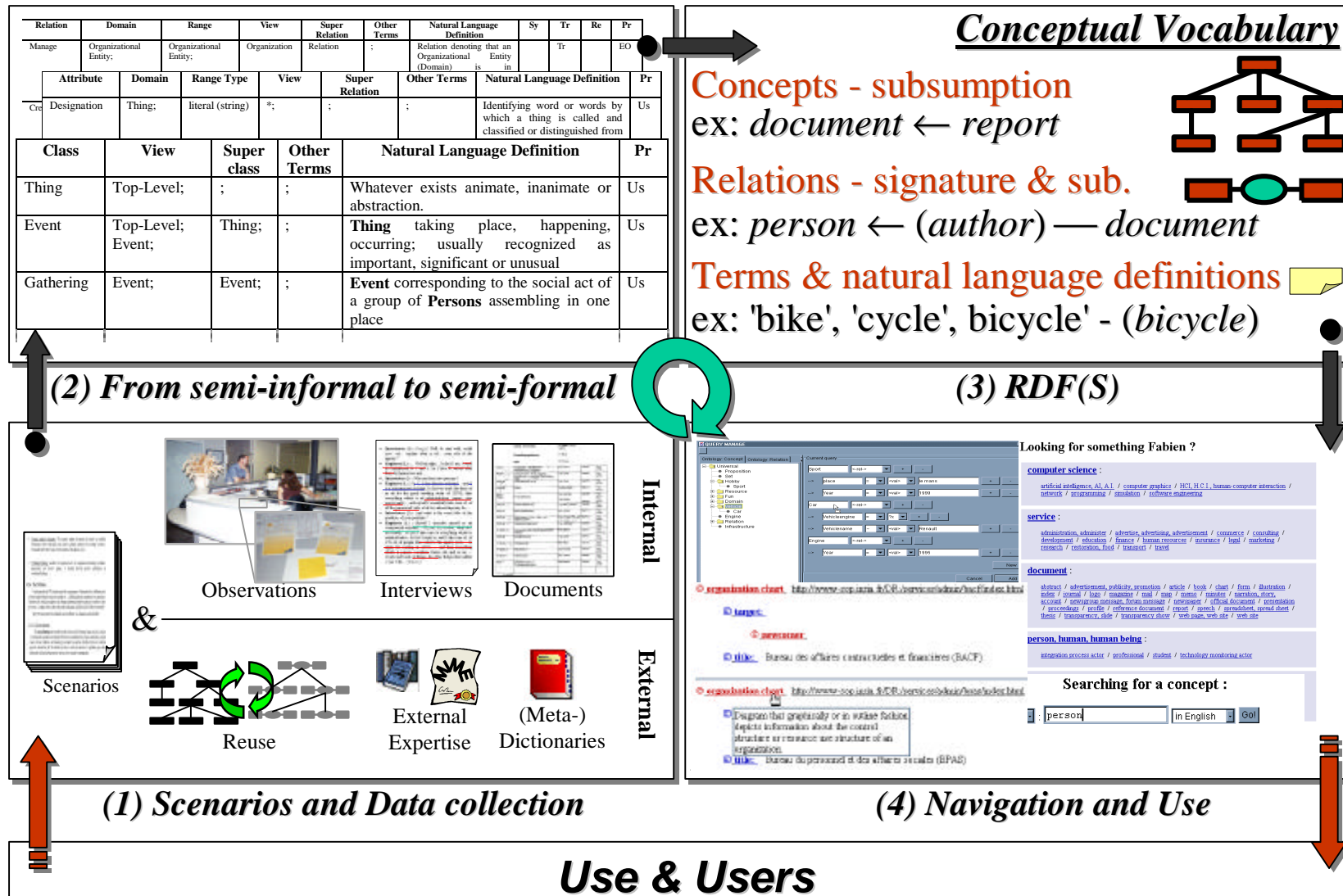




- ◆ **XML leitmotiv:** Bring structure to the memory to improve search and manipulation of documents using an emerging standard in industry.
- ◆ **RDF leitmotiv:** If the corporate memory becomes an annotated world, software can use the semantics of these annotations and through inferences help the users exploit the corporate memory.
- ◆ **Corporate semantic web: (annotated info world)**
  - Ontology in RDFS (O'CoMMA)
  - Description the Situation in RDF:
    - User Profiles (annotate person)
    - Organization model (annotate groups)
  - Annotations in RDF describing Documents (manipulation at semantic level)
- ◆ **Annotated persons & organizational entities**



® context awareness



# ◆ Define some guidelines (influences ex: KADS)

Characteristics	Representation	Facets	
Goal	Textual	Actors	Profile
Scenario Before	Graphical		Role
Scenario After	Informal		Individual goal
	Formal (UML)		Task
Scope			Action
Scenario / Sub-Scenario		Resources	Interaction
Generic / Specific			Nature
Example, Illustration			Services
Relevance life-time		Logical & Chronological	Constraints
Exceptions			Processes
Counter examples			Decomposition
			Sequential / Parallel / Non deterministic
			Loops & Stop conditions
			Alternatives & Switches
			Compulsory / Optional
		Flows	Inputs
			Outputs
			Paths
		Functionalities & Rationale	Functionalities description
			Motivation, necessity
			Advantages & Disadvantages
		Environment	Internal
			Organisation
			Acquaintance
			External

## ◆ Scenario Report : Rich story-telling document:

Document  
type

- Scenario analysis documents: The scenario analysis documents are based on available information about technologies and propose potential medium term strategic scenarios. Reasonably there will be only a few documents of this kind in a year.
- Workshops/briefings: Another very important way to communicate technology evolution, impressions and discuss opinion is through directly present information in workshops/briefings.

Event  
type

### 3.3.4 The TM Roles

Considering that the TM activities imply the management of information from different point of views (market-related, technical, strategic etc...) multidisciplinary competencies are necessary. Therefore both technical engineers and strategic/marketing-oriented experts are involved in this process to co-ordinate work, collect and present information and follow all TM lifecycle activities.

Three TM actors have been identified: Area Referents, Co-ordinators and BackOffice.

#### 3.3.4.1 The area referents:

The Area Referents are researchers who work in specific technical areas and are in charge of correlate the research work and the TM work. In particular they create a network of people made of Area Referents and technology specialists (researcher directly involved in technical projects relevant for the TM activity) in order to reach the objective of providing up-to-date information and proactively propose actions to the company's management.

Role  
type  
Function

Very rich document...

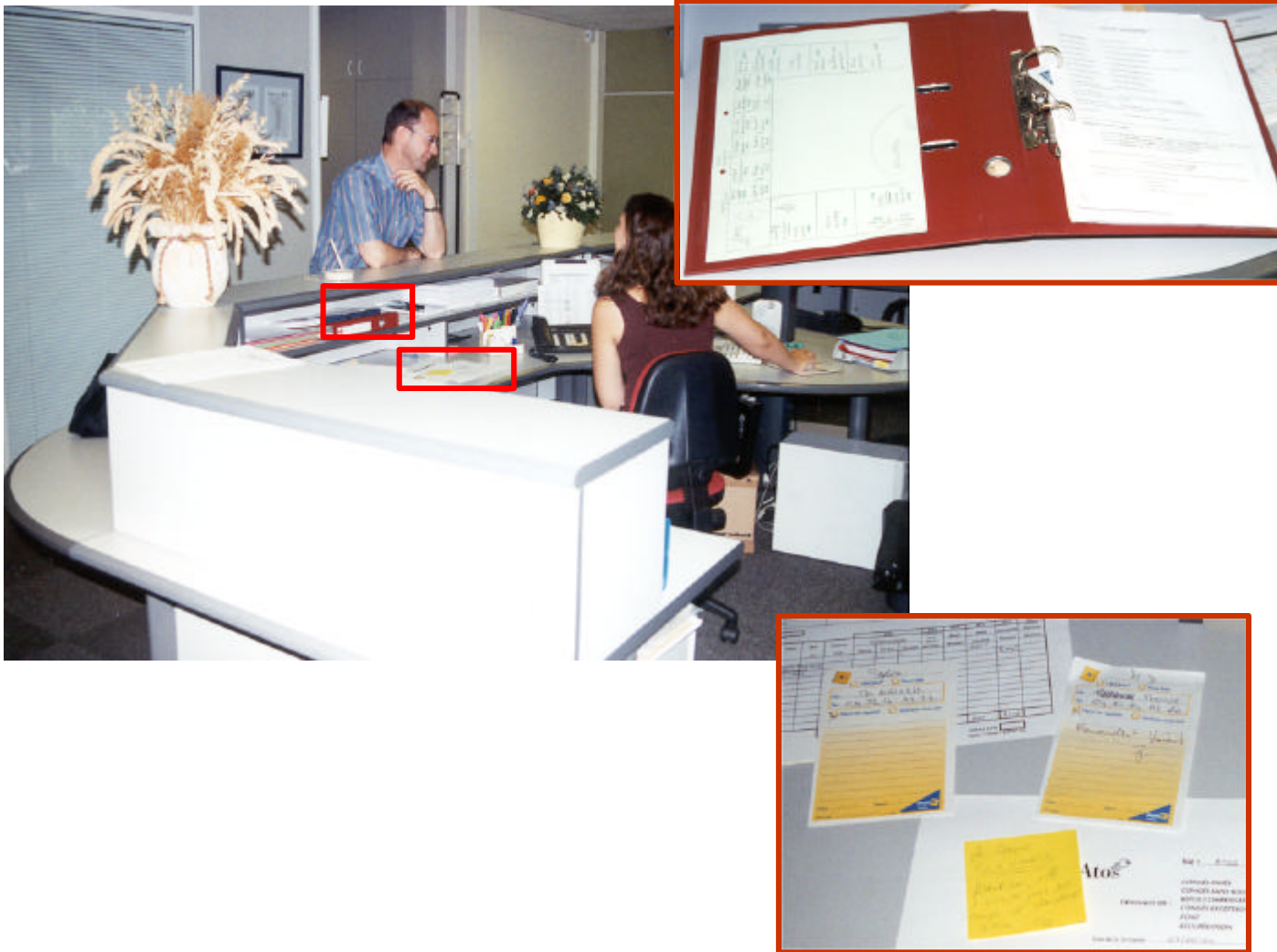
## ♦ Semi-structured (individual / group) guide for end-users:

- **Interviewer (1) :** *[laugh]* Well, to start with, could you , uh... explain what is uh... your role at the agency ?
- **Employee (L):** ... Well uh right... In fact I am, I work in complement to C and S. So I have to reread what they do themselves and...
- **Interviewer (2) :** Who are these two persons ?
- **Employee (L) :** So C, is the director assistant... and S is a management assistant. In fact we work the three of us uh for the good working order of ATOS, thus everything which is uh administration, papers, new person entry... and myself I essentially take care of, of all the paperwork side, a bit less interesting may be...
- **Interviewer (2) :** And what is the exact title of the position, of your position ?
- **Employee (L) :** Myself I describe myself as uh commercial assistant... Uh, yes, so, or else, what do I do exactly : so yes I take care of everything which is administrative. At first I reply to, well I take care of, of CVs of, of people who come to the agency post-... to apply for coming at ATOS ... and then everything which is papers, vacations forms, uh, and so on ... Loads and loads of things, the other things that neither C nor S do... *[Silence]*

Definition of role ( $\neq$ <sup>nt</sup> tasks)

Position :  
Personal definition  
 $\neq$  Official definition







Name, Vorname:		Dr. Müller, Heinz Jürgen		
Einstellungsdatum:		01.05.98		
DSt:		TZ FE14k		
PSZ-4 ✓	Angestellte, Gehaltskonten, Vermögensw. Leistungen	Herr Kottke	54/425	Tel.: 3780
PSZ-8 ✓	Umzugskosten, Trennungsgeld, Reisekosten, Kindergeld, Kindertagesstätte	Frau Deml	54/529	Tel.: 2724
PSZ-3a ✓	Personalbuchführung	Herr Grall	54/418	Tel.: 2718
PSZ-3b ✓	Urlaub	Thomas Mohr	54/418	Tel.: 2719
PSZ-1 PSZ-2	Personaleinsatz	Herr Schröder Frau Hierer	54/420 54/418	Tel.: 2711 Tel.: 2715
PSZ-5a ✓	Arbeitszeitregelung	Frau Maul-Gottaut	54/340	Tel.: 5954
PSZ-10	Wohnungsfürsorge	Herr Halfen	54/511	Tel.: 2733
PSZ-9a ✓	Krankenkasse, Post-, Spar- und Darlehensverein	Frau Polzer <i>M. Polzer</i>	54/510	Tel.: 8252
PSZ-6b ✓	Unternehmensausweis	Frau Weingart	54/438	Tel.: 1238
P183DA-1a	Vorübergehende Unterbringung BZ/FH Dieburg	Frau Möller	36/251	Tel.: 8291 ✓
PSZ-9b	Sozialbetreuung	Frau Loos	54/531	Tel.: 2728
P183-DA-11b ✓	Parkierlaubnis	Herr Sclor	34/123	Tel.: 6623
P184DA-2	Brandschutz	Herr Harsch	36/227	Tel.: 6620
P184DA-1	Arbeitsschutz	Herr Anders	36/226	Tel.: 7697
PSZ-4	Sonstige Fragen zu Tarifangelegenheiten	Herr Kottke	54/425	Tel.: 3780
01.05.98				

- ◆ What to do
- ◆ Where to go
- ◆ Who to contact
- ◆ How to contact
- ◆ In what order

- Multi-lingual
- NLP and Graphics

◆ **State of the art & Reuse:**

- Enterprise Ontology,
- TOVE Ontology,
- Cyc Ontology,
- PME Ontology,
- CGKAT & WebKB top ontology

◆ **Other sources e.g.:**

- “Using Language” Herbert H. Clark,
- MIME, Dublin Core,
- Meta-dictionary, *etc.*

◆ **Terminological study:** term to notions

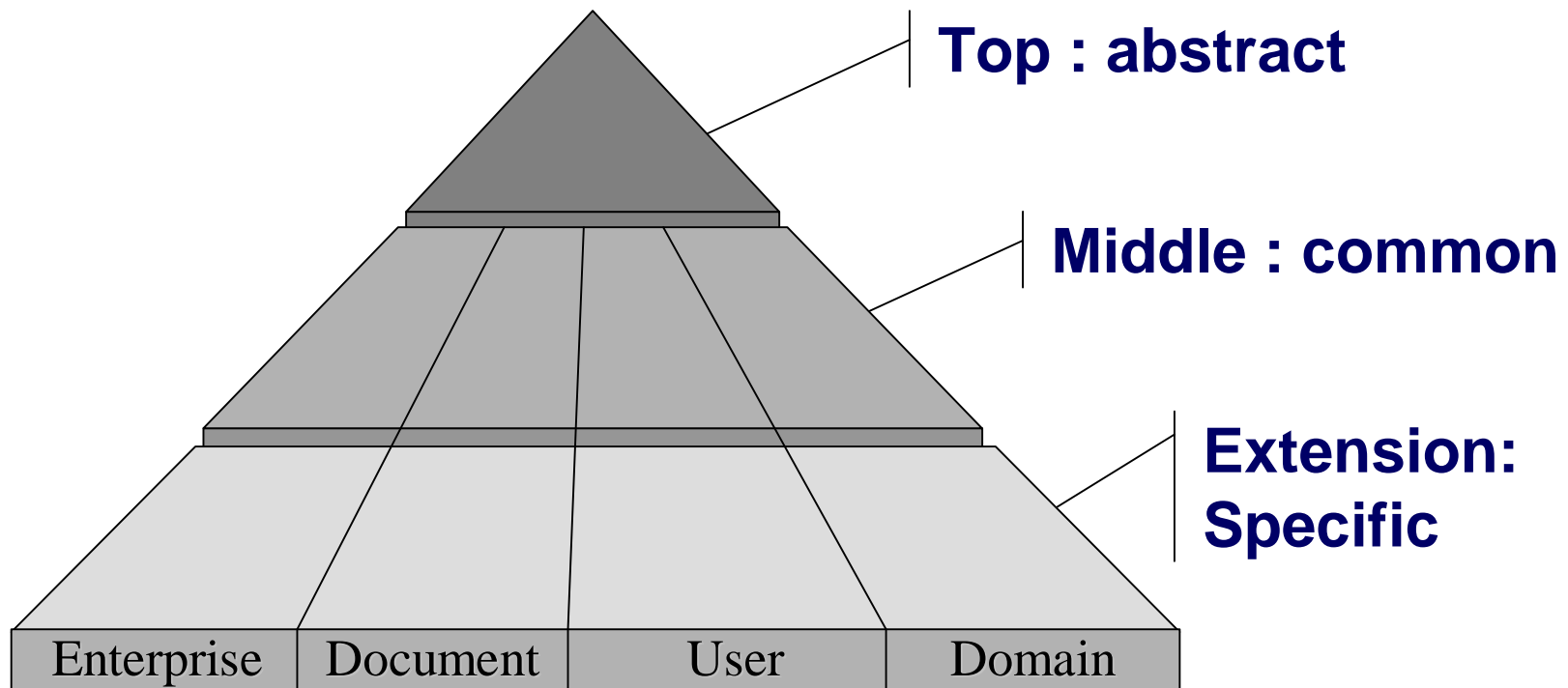
◆ **Continuum Informal ® Formal:**

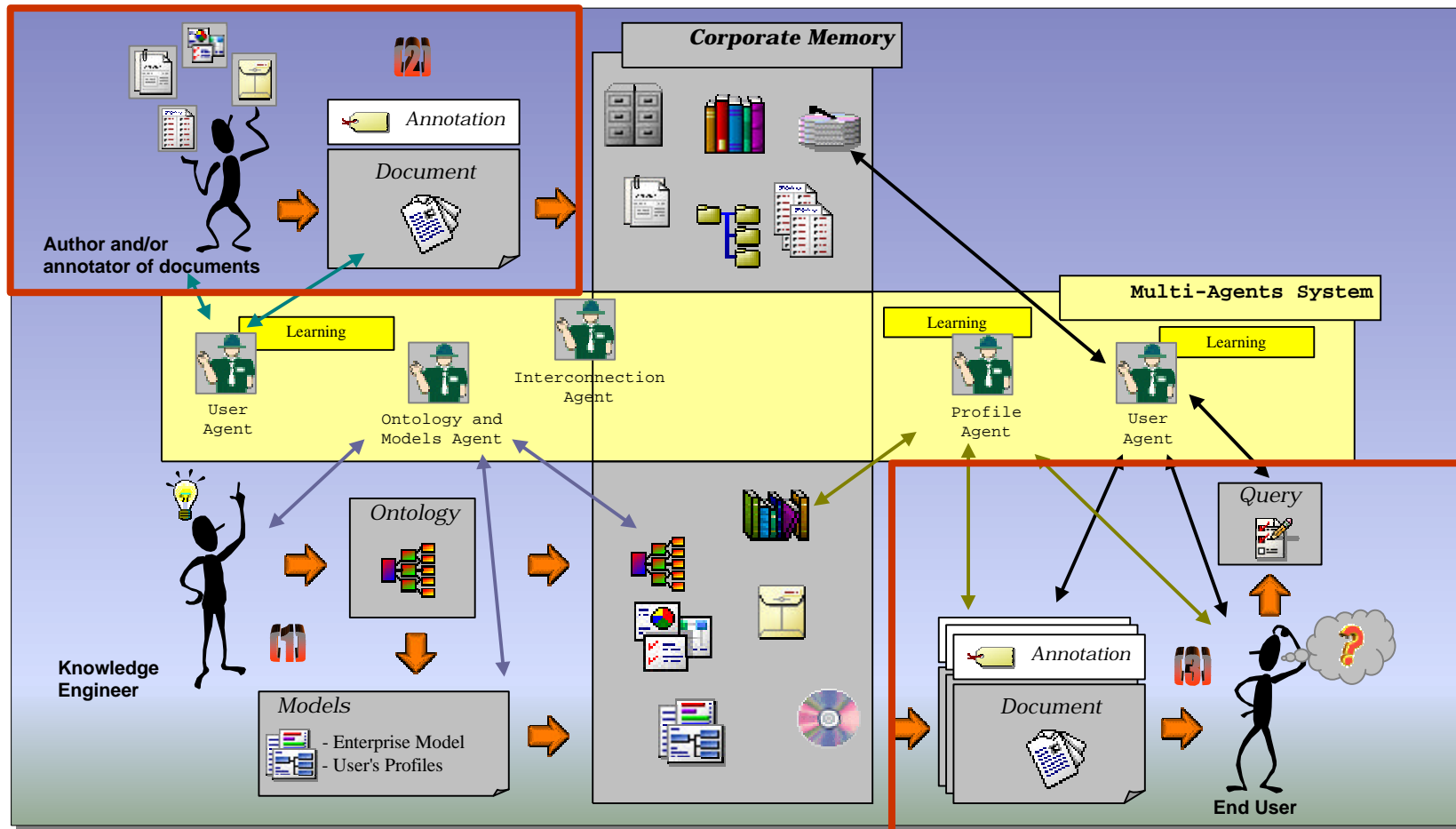
Informal (textual) → Lexicons (semi-informal) →  
Structured tables (semi-formal) → RDF(S) (formal)

◆ **Structuring:** Bottom-Up // Top-Down // Middle-Out

## ◆ Content:

- 470 concepts (taxonomy depth = 13 subsumption links).
- 79 relations (taxonomy depth = 2 subsumption links).
- 715 terms in English and 699 in French.
- 547 definitions in French and 550 in English.





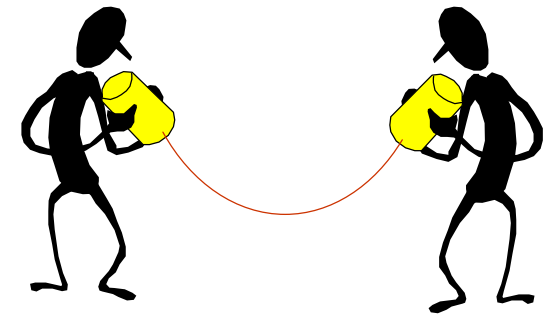
## ◆ User Interfaces

- Annotating documents
- Querying the memory
- Present the results
- Hide complexity (ontology, agents,...)



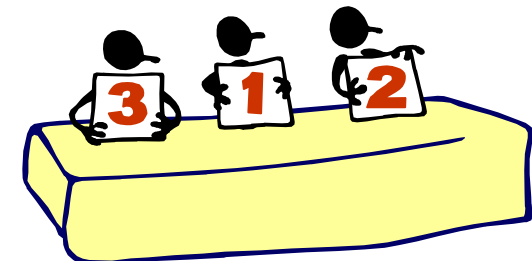
## ◆ Push technology

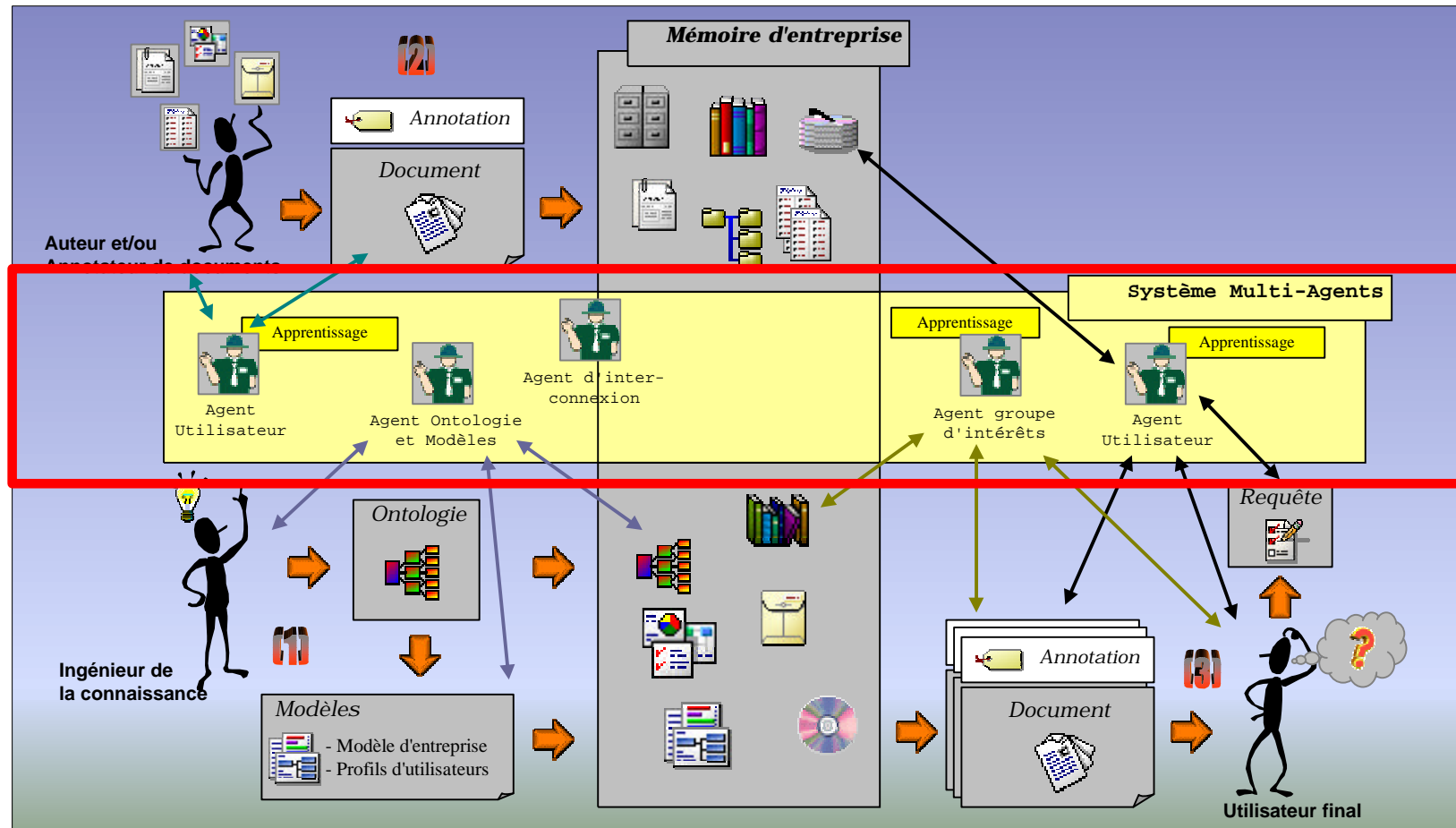
- Improve information flowing
- Proactive diffusion of annotations
- Communities of interest



## ◆ Machine learning **leitmotiv**: Represent, learn and compare current use profiles to improve future use.

- Learning during a login session
- Ranking results

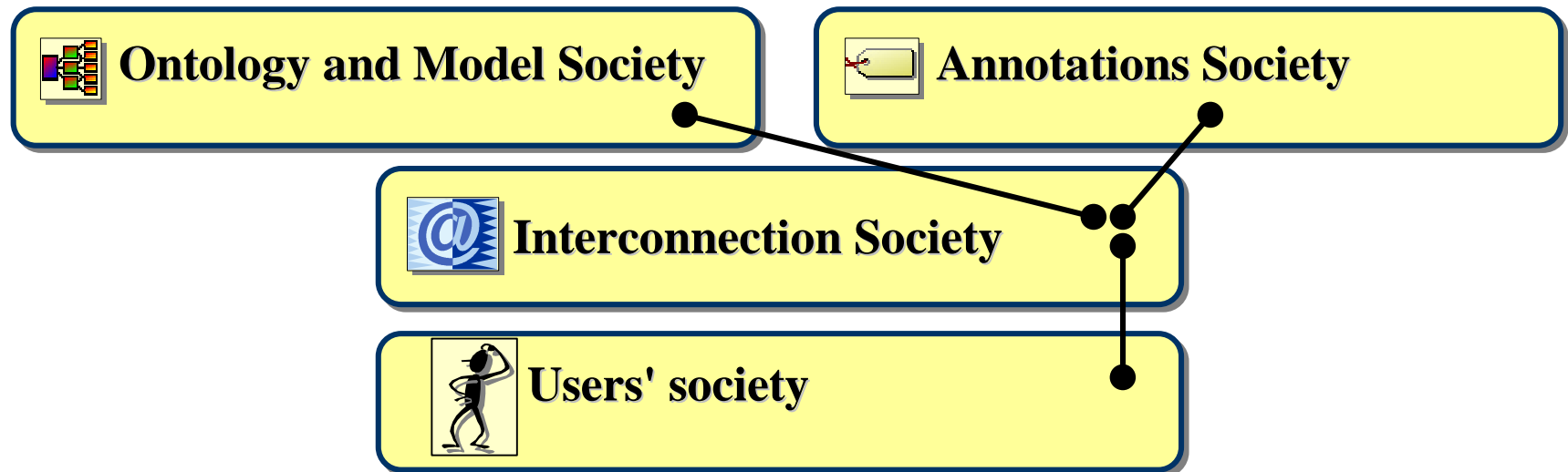


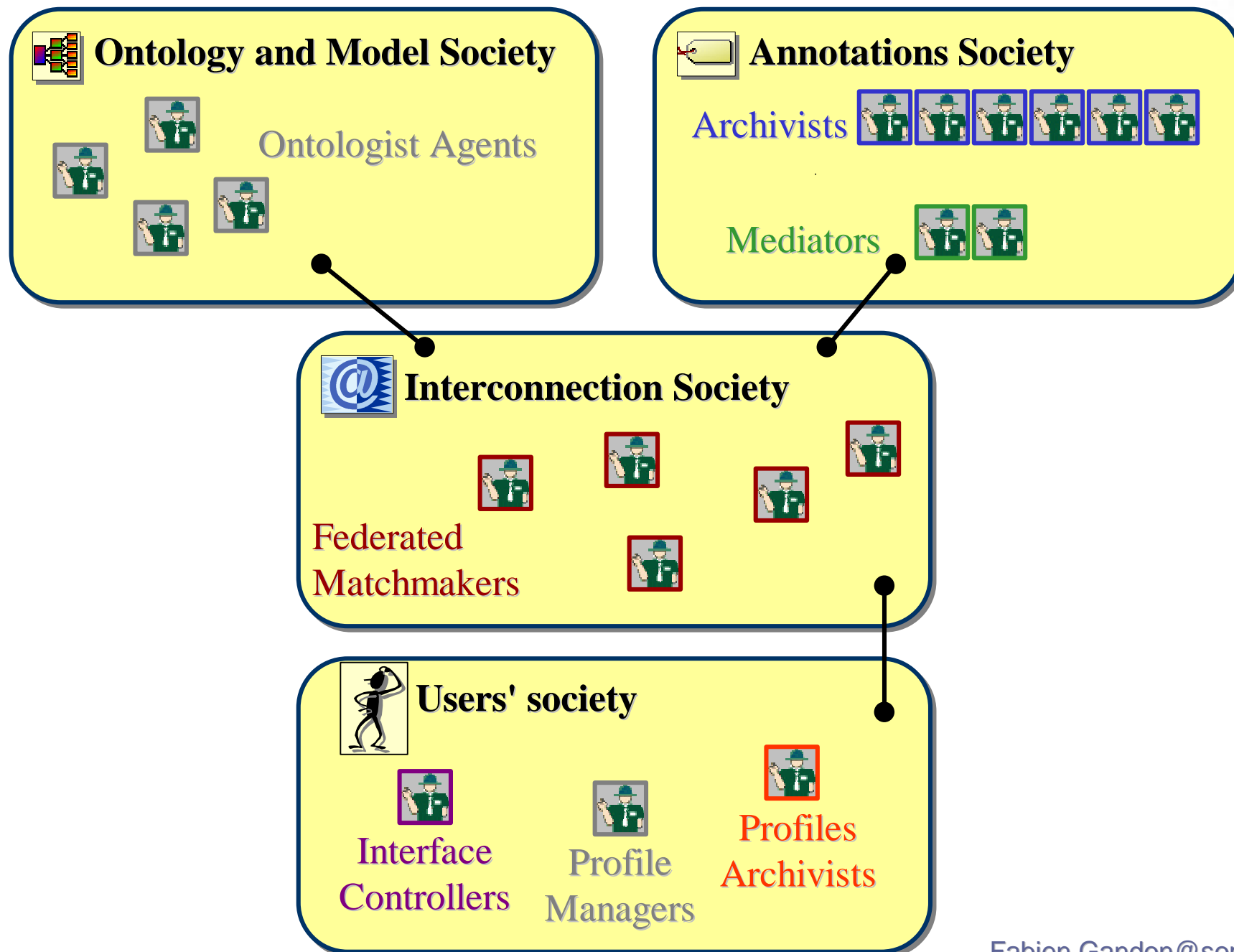




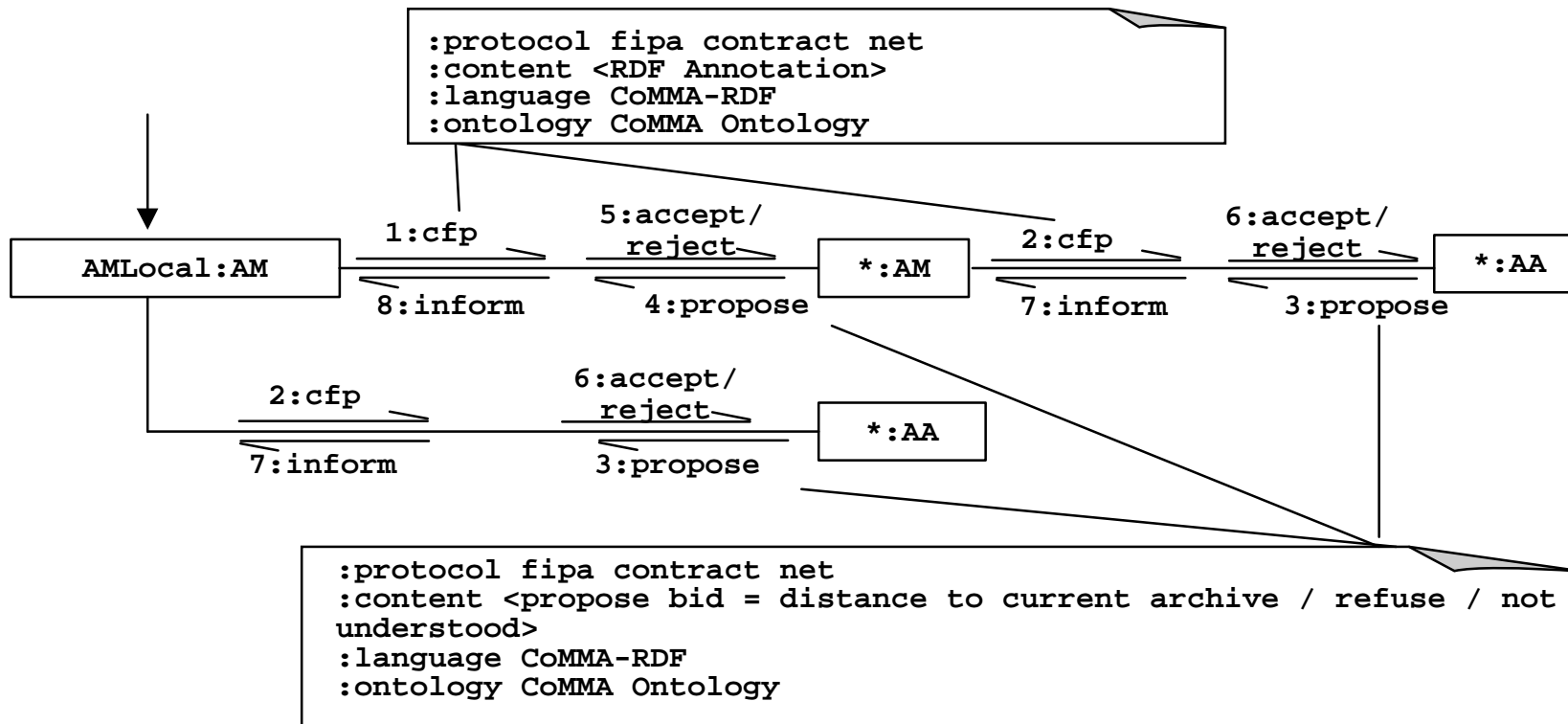
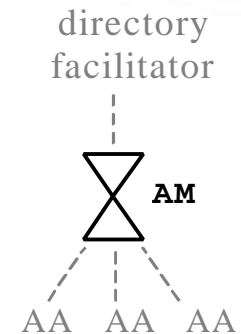
- ◆ **Leitmotiv:** One functional architecture leading to several possible configurations in order to adapt to the broad range of environments that can be found in a company
  - **Architecture:** Agent kinds and their relationships  
*Fixed at design time*
  - **Configuration:** Exact topography of a given MAS  
*Fixed at deployment time*
  - **One** architecture → **Several** configurations  
*Adapt to context*
- ◆ **Agent paradigm adequacy:**
  - Agent collaboration → Global capitalization
  - Agent autonomy & individuality → Local adaptation
- ◆ Integration of different technologies → interesting for a domain that requires multidisciplinary solutions

- ◆ **CoMMA** is an heterogeneous multi-agents information system
- ◆ From **Macroscopic** to **Microscopic**
  - Functional analysis for high level functions: societies
  - Four aspects in our scenarios: ontology and model availability, annotation management, user management and yellow pages services.





<b>role model</b>	Annotation Mediator role in the Annotation-dedicated society
<b>responsibilities</b>	handle distribution of annotations over the archivists both for new annotation submissions and query solving processes
<b>collaborators</b>	Directory facilitator, User Profile Manager, Ontology Archivist, Annotation Archivist, Corporate Model Archivist
<b>external interfaces</b>	RDF annotation manipulation interface
<b>relationships</b>	-
<b>expertise</b>	query and submission management
<b>interactions</b>	Query-Ref, Contract-Net, Subscribe, Request; FIPA ACL
<b>others</b>	-



## ◆ What you **did not** hear me say:

- "ontology, DAI, etc. are a silver bullets for KM"
- "an information system is the solution to KM problems"
- "an ontology is easy to build, use, etc."

## ◆ What you **did** hear me say:

- "Knowledge-based system are not the old expert systems"
- "Ontology is a new concept of knowledge representation that can be used in the supporting infrastructure of a complete solution"
- "Distributed A.I. offers paradigms that can be used to build software architectures adapted to KM distributed"

**Just an example of the fact that the use of formal knowledge and (distributed) artificial intelligence can go a long way in K.M. support**