

Title: A FIPA-compliant agent framework integrating Protégé-2000

Abstract:

Modern organizations structures evolve increasingly through group of shared and geographically distributed units. This dynamic of the organization combined with the intensive use of information resources broadcasted over the Internet quickly extend the organizational memory frontiers. Knowledge management processes are also modified to fit this new dynamic. Information systems do not escape this questioning. Previously built around centralized organizational memories, traditional information systems don't fit the new reality.

Many technologies are conceived to palliate the lack of structure and validation over the information available through the Web (Semantic Web and Web services) and to solve problems induced by the distributed and shared knowledge of the organizational memory. Unfortunately, those solutions are either incomplete or misfit to the reality of the problematic observed. We need an application that will assume a global approach organized from user viewpoint and adapted to the heterogeneous and distributed nature of organizational memory.

Prince has proposed to adopt the federate model to manage knowledge globally in a distributed and heterogeneous environment. This global approach defined by this model can be realized by adopting the multi-agents paradigm. Multi-agents system fit well the dynamic of organizational memory by suiting the actual technologies used and allowing the functionality evolution by giving the opportunities to add agents to realize the future requirements from the knowledge management process. More, multi-agents systems are conceived originally to accomplish their tasks within a distributed and shared environment and then fit well to our problematic environment.

*Prince emphasizes the necessity to use a global model integrating communicational gateways at the physical, symbolic and semantic levels to avoid dysfunctions at the global level. The multi-agents system **Java Agent DEvelopment Framework (JADE)** embodies those communicational gateways by making available normalized communication mode for agents. The agents are also part of the Semantic Web propositions to facilitate the access and broadcasting of knowledge by using public ontologies. An ontology specifies a shared viewpoint over a part of the world through a hierarchy of concepts and relations. The annotations of document with terms belonging to ontology allow to precise the attribute meaning and facilitate the agents' intercomprehension at a semantic level.*

*Our specification for COSMO (**C**onnaissances **O**rganisées par un **S**ystème **M**ulti-agents à l'aide d'**O**ntologies) integrates JADE and Protégé-2000 as the two central modules for our system. We have realized the software's specifications with the help of the **Process for Agent Societies Specification and Implementation (PASSI)**. This methodology allows generating automatically, with a specification conforming to the **Agent Unified Modelling Language (AUML)**, the agents for JADE. COSMO's agents support the knowledge management process from a user point of view. The user's viewpoint is concretely represented in the combination of different ontologies created with the Protégé-2000's friendly user interface. These ontologies could be imported from the different member's communities. With the help of the ontologies defined by the user or imported by him, agents will use their mobility and some autonomy to navigate through the organizational memory and the semantic web to realise their tasks. The user will be able to monitor the agents' activities, create or destroy agents, and assign or modify their tasks. We have designed six system's agents (**CommunityAgent**, **OntoTranslator Agent**, **Service Finder**, **ServicesAgent**, **SmartAgent** and **UserAgentUI**) who will use their capacities and collaborate to support the knowledge management process offered by COSMO.*

Keywords: COSMO, Multi-agents system, JADE, ontologies, Protégé-2000, knowledge management, architecture, semantic web.