Construction and evolution of a domain ontology in the framework of a data integration system opened on the Web

Context
Innovation in packaging and modified atmospheres must meet the constraints that arise due to current trends in lifestyles and consumer behaviour. Food must be safe and the weight of packaging on energy costs and environmental impact must be reduced. However, research is sorely needed on the relationships between film type and modified atmospheres, food product and micro-organisms to gain the essential knowledge and data to optimise all the aspects of the system.

Objectives
The general framework of this research is the representation and engineering of knowledge. The objectives of my research concerns more precisely the question of the construction and the evolution of an ontology in a data integration system which allows local bases to be enriched with data extracted from the Web. This ontology is central in the data integration system and allows (i) the indexation of data in the local bases, (ii) the extraction and the semantic annotation of Web data with n-ary relations defined in the ontology and (iii) the flexible and unified querying of the local data and the data extracted from the Web.

Our objective is to guide the annotation by an OTR because it allows a separation between the terminological and conceptual components and allows dealing with abbreviations and synonyms. Moreover, we intend to propose a method for the management of the OTR which must be complemented to take into account the new knowledge on gas diffusion and packaging. This research is original because it concerns evolution of ontologies allowing the representation of n-ary relations and including both a conceptual and terminological components.

Scientific approach
As the ontology (OTR) is central in the data integration system, we intend to:

1. Propose a relevant model for an Ontological and Terminological Resource (OTR) dedicated to the task of n-ary relations annotation in Web documents.
2. Propose a method for the management of the OTR evolution which should be able to take into account different types of changes: (i) changes explicitly required by ontologists, (ii) changes due to an alignment with external ontologies, (iii) changes required after an evolution to preserve the OTR quality assurance criteria (iv) changes required after an evolution to preserve the annotation bases quality.

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Personal Competencies
In 2010, I obtained my Master’s degree in Computer Sciences (Orsay University). This diploma as well as my first Phd’s year have allowed me to manage different skills in semantic web.

Project founding
My thesis is financed simultaneously by the INRA MIA research department and by the ANR project MapOpt.