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A Resourceful Framework Using Combined Agent Ontology Mapping for Semantic Web

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Abstract - **The combined agent ontology mappings assure that more and more people will start using ontology. The expectations are also high when one thinks about the potential use of these applications. Ontology mapping plays a vital role in achieving heterogeneous data integration on the Semantic Web. This enables a large number of ontology present on the web need to be aligned before one can make use of them. But this ontology can differ in representation, quality, and size that pose different challenges to ontology mapping. The main purpose of implementing this multi agent ontology mapping framework was that operate effectively in the Semantic Web environment. The aim is to build a framework that solves the difficulty of evaluating ontologies with a large number of concepts. Here a number of domain experts are necessary to evaluate similar concepts in different ontologies. The experts combine their knowledge and experience to create a solution rather than relying on a single person perspective. In this the classes are represented as RDF individuals where the individual properties are defined as OWL data properties. Here both ontologies are valid separately, and no logical reasoned would find inconsistency in them individually. It is easy to see that, once we compare the two ontologies, a considerable amount of uncertainty arises over the classes and its properties and in a way they can be compared. This uncertainty can be contributed to the fact that, owing to the different representations, certain elements will be missing for the comparison.**
Keywords: **Ontology, Mapping, Semantics, Ontology agent**

I. INTRODUCTION

Ontology provides a means in which semantic search can be implemented. Using ontology to keep data in a dynamic database is considered as an appropriate approach to understand contextual relationships of term. This term is what we call vocabulary where the data is given a well-defined meaning that is consistent across context. Furthermore, with the contextual relationships defined in the ontology, more information could be linked without the user realizing the information primarily subsists.The Ontology mapping systems will always need to consider the uncertain aspects of how the Semantic Web data can be interpreted. This increase in interconnectivity among data producers and data consumers, mainly spurred through the development of the Internet and various Web-based technologies. Here we focusing the process that deal with ill-defined, inaccurate, or inconsistent information about the domain. Data syntax covers the way data are formatted and become represented. Data semantics addresses the meaning of the data. Ontology is a conceptualization clear description; it abstracts certain application field of the real world into a set of concepts and relationships of concepts. Integrating the ontology into the technology of text information retrieval not only inherit the advantages of information retrieval but also overcome the limitations that concepts information retrieval cannot deal with the relationships of the concepts. It raises the accurate ratio and recall ratio of information retrieval.

II.SEMANTICS AND ONTOLOGIES

Ontologies provide a promised technology t o solve the semantic heterogeneity problem. The term ontology was introduced by Gruber as an explicit specification of a conceptualization". A conceptualization, in this definition, refers to an abstract model of how people commonly think about a real thing in the world; and explicit specification means that concepts and relationships of an abstract model receive explicit names and definitions. In general terms, ontology is an organization of a set of terms related to a body of knowledge. Unlike a dictionary, which takes terms and provides definitions for them, ontology organizes knowledge on a basis of concepts. Ontology expresses a concept in a precise manner that can be interpreted and used by computer systems, whereas dictionary definitions are not process able by computer systems. Another difference is that by relying on concepts and specifying them precisely and formally we get definitive meanings that are independent of language or terminology.

III.METHODOLOGY PROPOSED

The World Wide Web Consortium (W3C) has proposed Resource Description Framework (RDF) and Web Ontology Language (OWL) for representing information in the Web. W3C has proposed other languages like Simple Knowledge Organization System (SKOS) which is a standard to support the use of knowledge organization systems (KOS) such as thesauri, classification schemes, subject heading systems,

and taxonomies within the framework of the Semantic Web. The Ontology Alignment Evaluation Initiative (OAEI) competitions and have processed more than two tracks. There are other proposed systems as well; however, as the experimental comparison cannot be achieved, we do not include them in the scope of our analysis. The proposed solution is that we approach the ontology mapping problem based on the principles of collective intelligence, where each mapping agent has its own individual belief over the solution.

IV. RELATED WORK

Ontology mapping is a key for realizing ontology interoperability. The process of ontology mapping includes usually two main parts. One is mapping discovery; the other is mapping selection. It calculates similarity between match able elements in different ontologies. Mapping selection regards the output of the mapping discovery as input. And then it uses methods of mapping selection, such as greedy algorithm, optimization algorithm, to obtain a final mapping. Ontology is a way of knowledge representation and is used to model structure of data, semantic of data. Ontology mapping plays an important role for realizing ontology interoperability. The systems pay little attention to the problem how to effectively select the mapping between Ontologies. Info Sleuth [1] is an agent-based system for the integration of heterogeneous sources.It is developed by Microelectronics and computer Technology Corporation (MCC), Austin, Texas, USA. The purpose of the Info Sleuth project is to retrieve and process information in network of heterogeneous information sources. In Info Sleuth system, Ontologies are used to capture database schemas, conceptual models and aspects of its agent architecture. Here, there are two main tasks to accomplish, 1) describing the information sources, and 2) specifying the agent infrastructure, i.e. the context in which agents operate, its relevant information and relationships, etc.InfoSleuth system have an agent-based architecture to provide interoperation among autonomous systems. The different sources are integrated in a dynamic way and this is made possible by using a network of co-operating agents that form the Info Sleuth architecture. There are five kinds of agents in Info Sleuth [11]: User Agent This agent provides an interface that enables the user to communicate with the system independently of location. It obtains information about the Ontologies known to the system and it uses them to prompt its user in selecting an ontology that will be used to formulate queries. Resource Agent This agent allows the Info Sleuth architecture to access the information sources and executes the requests concerning a specific resource. It translates queries expressed in a common query language into a language understood by the resources. This translation comprises both the mapping of the shared ontology into database schema, and the mapping of the query language into the native language.

Ontology Agent This agent is a specialized Resource Agent whose main task is to answer questions about Ontologies. It maintains a knowledge base of the different Ontologies used for specifying requests. Using this knowledge base, the Ontology Agent can answer queries about the Ontologies available, such as the source of ontology and search the Ontologies for concepts.

Broker Agent This agent aims at finding the set of relevant resources that can solve user query. It collectively maintains the information that the agents advertise about them. All Info Sleuth agents advertise their capabilities to the broker agent that semantically matches agents looking for a particular service with agents providing that particular service (information brokering technique).

Task Execution Agent This agent use information provided by a broker agent to route requests to the appropriate Resource Agents. It decomposes user queries into sub-queries and reassembles the answers, thus coordinating the executions of high-level information gathering sub-tasks.

They propose a method to detect alignments (also called conflict sets) that introduced new knowledge to ontologies to be matched. Then they remove at least one alignment in every conflict set to guarantee that a mapping does not change the meaning of concepts in the matched ontologies based on inference of distributed description logic. Mapping selection usually uses an initial mapping M as input. The initial mapping M could be obtained by using techniques of mapping discovery, such as edit distance, semantic lexicon, and cosine distance.

We propose a framework for mapping selection based on the semantic and structural information in ontologies.

A strategy was also proposed to process the conflict pairs based on the structural characteristics of alignments. In experiments, based on the proposed method, we implemented an ontology mapping system iMatcher which employs edit distance to discover the initial mapping M between Ontologies.

A. An ontology mapping extraction method based on set covering

The ontology mapping is based on similarity calculating is the mainstream method, which extracts the ontology mapping after the similarities between source ontology and target ontology are calculated. Ontology Mapping is the foundation of semantic query and semantic integration based on ontology. As the crucial point of ontology mapping, the task of mapping extraction is to find whether there exists the ontology mapping among the similarities between source ontology and target ontology. The problem of set covering, and in this paper an algorithm of ontology mapping extraction SME based on SCM is put forward.

The main shortcoming of threshold lies in how to choose the value of the threshold, since different thresholds impact the final mapping extraction greatly, and how to choose the

threshold soundly is a problem which should be taken into account thoroughly. The set of data dependent ball (compression set) which covers the training data in maximum extent from training dataset, and judges the class of testing data (the validity of ontology mapping) through the conjunction of data dependent ball in testing dataset. It bring down the generalized error and improve the precision of ontology mapping extraction should be resolved in the future work.

B.Architecture

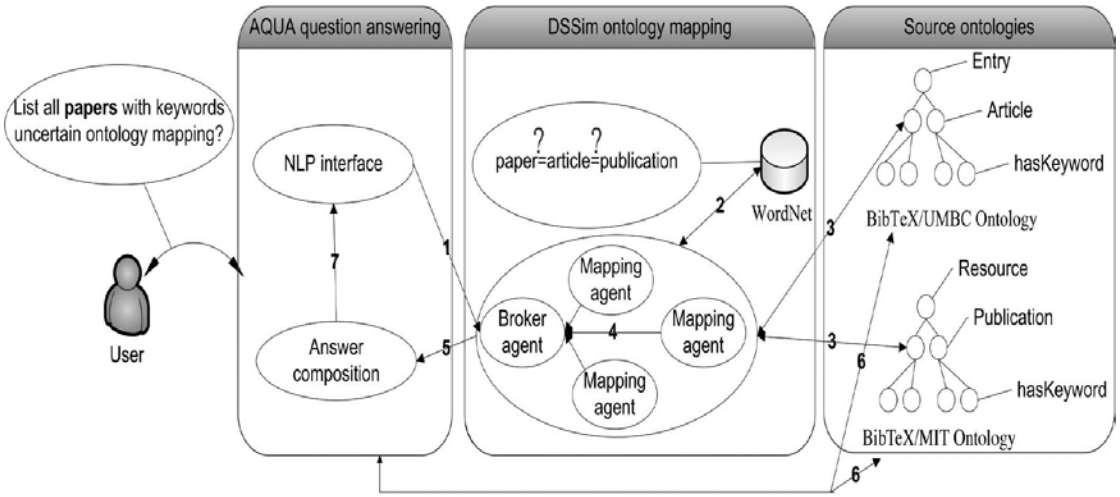

Fig.1 Architecture of ontology mapping

V.EXISTING SYSTEM

DSSim gave us the possibility to test the proposed mapping algorithm on different domains including medical, agriculture, scientific publications, Web directories, food and agricultural products, and multimedia descriptions. The experiments were carried out to assess the efficiency of the mapping algorithms themselves. The weakness of DSSim is that it provides good mappings when only semantic similarity can be exploited. The architecture of DSSim is easily expandable with the addition of more mapping agents; it is possible to enhance the semantic mapping performance in the future. We discuss what problems need to be addressed before one can achieve such machine intelligence for ontology mapping and introduce a multi agent ontology mapping framework (DSSim).

VI.RESULT EXPECTED

Ontology mapping have to overcome the scalability issues becomes one of the decisive factors for determining the usefulness of a system. The development of ontology applications, domain ontology can become very large in scale. This can be partly contributed to the fact that a number of general knowledge bases or lexical databases have been and will be transformed into ontology to support more applications on the Semantic Web. Mapping agents utilize both syntactic and semantic similarity algorithms and build beliefs over the correctness of the mapping. Each system is usually designed to address a particular need from a specific domain. They have the freedom to hand pick some specific set of ontologies and demonstrate the strengths and weaknesses of their system, carrying out some experiments with these ontologies. The problem, however, is that it is difficult to run the same experiments with another system and compare the two results. This problem has been acknowledged by the ontology mapping community and as a response to this need.

VII.CONCLUSION AND FUTURE WORK

The combination of three challenges that we think are crucial to address, in order to provide an integrated ontology mapping solution. DSSim is easily expandable, layered with clear interfaces, which allows us to integrate the proposed solution into different contexts like Semantic Web Services. These allow us to improve, evaluate, and validate the solution, compared with other state of-the-art systems.

In the future, we aim to investigate further the belief combination optimization, compound noun processing, and agent communication strategies for uncertain reasoning.

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