DIPLOMAT: Business Rules Interlingua and Conflict Handling, for E-Commerce Agent Applications (Overview of System Demonstration)

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1 Overview of DIPLOMAT System Demonstration

Rules promise to be widely useful in Internet electronic commerce, including as a key part of equipping many e-commerce agents with intelligence. One challenge for realizing this promise is the heterogeneity of rule systems and syntaxes. Another such challenge is the occurrence of conflicts during updating and merging rules, e.g., when an agent imports rules acquired from another agent or when an agent's rule set is modified by multiple authors.

In response to these challenges, we have developed DIPLOMAT [4] [3], a Java library that provides innovative capabilities to meet both of these challenges. First, DIPLOMAT provides an executable **interlingua** (i.e., a common KR), based on declarative logic programs[1] as a knowledge representation (KR). This interlingua [5] supports translation to and fro multiple syntaxes, while preserving a deep declarative (model-theoretic) semantics. These syntaxes include XML (Business Rules Markup Langugage, which we have designed), ANSI-draft Knowledge Interchange Format (KIF)[2], and three flavors of ordinary logic programs (cf. pure Prolog). Second, DIPLOMAT enables significantly easier conflict handling by providing an extension of this KR to **Courteous** logic programs [2] [3] [4], a practically attractive form of executable prioritized default rules. DIPLOMAT facilitates practical software engineering of the courteous extension by providing a **compiler** from courteous LP's to ordinary LP's.

We have developed several agent-mediated e-commerce application scenarios for DIPLOMAT. One scenario, currently being incorporated into an application prototype, is to use DIPLOMAT to represent and communicate dynamically evolving contractual agreements [6] in business-to-business Web agent **negotiation**, between two enterprises in a manufacturing supply chain. Another scenario [4] is to use DIPLOMAT to represent a dynamically evolving rule set of

[1] supporting both forward and backward inferencing, with standard model-theoretic semantics (reviewed, e.g., in [1])

[2] http://logic.stanford.edu/kif/ and http://www.cs.umbc.edu/kif/

a Webserver bookstore **sales** agent, that performs personalized discounting and targeted promotions/advertisements.

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