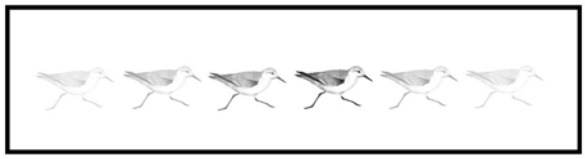

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**Rule Languages for Interoperability Workshop**
**Position Paper**

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The OMG's Meta Object Facility (MOF™) defines the metadata architecture for Model Driven Architecture (MDA®) and provides a basis for automating metadata management. Metadata, in this context, includes database schema, UML™ (Unified Modeling Language) models, workflow models, business process models, business rules, API definitions, and so on. MOF defines standards for automating the physical management and integration of different kinds of metadata through metamodels and mappings among them.

The Semantic Web is a logical extension of existing World Wide Web Consortium (W3C) standards, such as XML, XML Schema, and SOAP that enables explicit representation of business semantics. The goal is to make domain-specific context, nomenclature, and the language used to describe content and services on the web unambiguous from a computing perspective. Its underlying formalisms and technologies have evolved from more than two decades of research in knowledge representation, computational linguistics, and automated reasoning.

MDA and the Semantic Web were conceived independently and evolved with little cross-pollination over the course of several years. However, participants from both communities have recognized business benefits to bridging the two technologies to form a coherent, enterprise information interoperability architecture. The main realization of this to date is the Ontology Definition Metamodel (ODM) standard, which is nearing completion in OMG with the participation of key members of the Semantic Web community.

Sandpiper Software is a primary ODM author and contributor to the broader OMG Ontology Platform Special Interest Group (PSIG), and is specifically responsible for developing the metamodels and mappings for Simple Common Logic (SCL) for the ODM. To that end, we have been working closely with the SCL language developers to faithfully capture its abstract syntax, and have, in turn, influenced the design of the language itself. We have also been working with the OMG's Business Semantics for Business Rules (BSBR) towards alignment of the BSBR specification with the ODM, such that BSBR will ultimately *depend on* the SCL metamodel components of the ODM.

As the core ODM specification is completed, the Ontology PSIG is turning its attention to critical extensions, including additional mappings between the SCL metamodel and others in

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the ODM, support for semantic web services and additional rule language support, and metadata management capabilities, as well as providing interoperability with other relevant standards such as ISO EXPRESS. Metamodels and mappings for additional language support will necessarily be developed using the same set of technologies and principles applied during development of the ODM, namely, development of Meta Object Facility (MOF) 2.0 based metamodels reflecting the abstract syntax of the individual languages, and mappings among the metamodels represented using the emerging MOF Query / View / Transformation (MOF QVT) standard currently under development. Because Sandpiper is a key contributor to this work and developing a UML-based ontology development environment that reflects the combination of the ODM and W3C Semantic Web standards, we are keenly interested in rule languages and technologies to support them. Use cases of interest include policy-based applications that build on traditional software engineering in combination with declarative knowledge and rules representation and composition of semantic web services coupled with MDA-based service choreography, among others.

Additionally, Sandpiper Software has recently become actively involved in the DoD-sponsored Extended Metadata Registry project (XMDR). XMDR is concerned with the development of improved standards and technology for storing and retrieving the semantics of data elements, terminologies, and concept structures in metadata registries. Development on XMDR is based both on the OMG Ontology Definition Metamodel (ODM) and MDA families of standards as well as relevant metadata standards from the ISO community, including ISO 11179 metadata registry and ISO 19763 metamodel registry standards (which also depend on the OMG ODM). The program is developing and plans to propose extensions of the ISO/IEC 11179 to support more diverse types of metadata and enhanced capabilities for semantics specification and queries, including rules for interoperability among ontology and metadata representations.

Our participation in this workshop includes representation of the OMG ODM-related standards efforts, the XMDR program and interest in Semantic Web standards for rules representation as applied to metadata registry interoperability, and Sandpiper's corporate interest in developing a UML-based development environment for leveraging such standards in our tools and applications.

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