An ontology server for the agentcities.NET project

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An Ontology Server

... for the agentcities.NET project

- Review architectures, software toolkits, encoding formats
- Mechanism for populating the server
- Development of interactive and machine interfaces
- Deployment of service on agentcities.NET

Deployment grant: Sept 2002 – Feb 2003
Terminology

Metadata is
- structured data about data
- a form of language (pidgin)

A metadata vocabulary or schema:
- declares a set of concepts or terms and their associated definitions and relationships
- the terms are often known as elements, attributes and qualifiers
- the definitions provide the semantics, ideally these are both human and machine readable
- in effect a manifestation of an ontology

A scheme:
- controlled vocabulary or enumerated type
Ontologies & Schemas

Conceptual Ontological Model

Data Model

Metadata Vocabulary

- Human-readable text encoding
- Machine-readable XSD encoding
- Machine-readable RDFS encoding
- Web readable HTML encoding
Motivation

• Disclosure of metadata vocabularies
• Investigation of individual terms as well as whole vocabularies for adaptations, local usages and relationships with other vocabularies
• Interoperability - convergence of ontologies within specific domains e.g. education, cultural heritage, publishing, rights management etc.
• Reasoning and inference - automated querying of metadata vocabularies by software agents to acquire the semantics associated with specific terms
Contents

• Ontologies or metadata vocabularies
• Notion of *Application Profiles* as basis for encodings
• Specification language currently used is RDF Schemas
Architecture

Centralised - heavy maintenance burden
e.g. ISO/IEC 11179 based registries
(Environmental Protection Agency, Australian Health Information Knowledgebase), Dublin Core Metadata Initiative (DCMI), DESIRE, MetaForm

Distributed - content and maintenance is distributed, based on a harvesting model
e.g. SCHEMAS and CORES RDF registries
Encoding formats

- XSD (lacks underlying data model)
- RDFS (lacks explicit data typing, structuring and constraint modeling)

OWL
DAML+OIL
WebOnt WG
RDFcore
Ontology acquisition

- Schema Registry/Ontology Server
- RDF triples database
- Internet (HTTP)

RDFS encoding
Interactive interface

• Support for schema developers and implementers
• Disclosure or publication environment for vocabularies
• Enable queries across a whole range of schemas
• Clarify relationships between vocabularies
• Encourage sharing of existing vocabularies to help avoid duplication of effort
• Encourage convergence and harmonisation within single domains
• Promotion of standards to improve potential for cross-domain interoperability
**Machine interface**

Software interface to allow agents to query, search and navigate metadata vocabularies

- retrieve semantics
- perform inferencing and reasoning tasks

Essential infrastructure for the Semantic Web
Deployment of service

- Connection of the server to agentcities.NET network
- Provision of semantics in a machine-readable format to enable effective function of software agents in providing automated services
Selected references

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