

Introduction to the Workshop
Vocabularies, Ontologies and Rule for the
Enterprise (VORTE)
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Part I

Vocabularies and Ontologies

The Roles of Vocabularies

- in content management (CM) – use controlled vocabularies for content classification, syndication
- corporate taxonomies have been successfully applied in document management from e-government to financial services
- in SOA – include standard business registers and service taxonomies (like UNSPSC) in UDDI
- extension knowledge management
 - handles not just content but also personal and team knowledge assets
 - need general descriptive approach to link business, service domain and skills/competencies

Why Ontologies in CM

- ontologies extend taxonomies by (typed) relationships
- and clearer logical foundation in model theoretic semantics – but that's not our concern here
- why ontologies in CM – need relationships
 - doc X falls under regulation from doc Y,
 - doc X describes a part of a mechanism described in doc Y
- important application area is ontologies in medical domains for international re-use of disease and treatment descriptions (see IFOMIS)

Why Ontologies in SOA

- beyond UDDI –
 - define services not by referencing their port types but their functionality
 - semantic service registry rather than datatype and function call oriented link collection
- for composition of services defined by semantic criteria businesses will need service mediation as defined in WSMO from DERI – example scenario
 - have national rail ticket purchase services
 - for an international rail ticket, combine these services with data structure adaption involving several WSDL
- more generally, for service composition, a WSMO engine (like WSMX being developed at DERI) will allow to check business processes against semantic execution models of composed services

Data driven vocabularies and ontologies?

- feeding from data – can we build vocabularies or even ontologies from text data?
- important distinction
 - learning – build the taxonomic and / or relational structure inductively from mining texts (task of clustering)
 - population – take a defined structure and just determine to which class / which relations a text belongs (task of statistical classification)
- how do automatic extraction methods cope with natural language concepts?
- will be addressed by Christophe Roche's talk

Upper Ontologies

- foundational and upper ontologies
 - e.g., need an ontology of events, durations and actions for analyzing medical treatment or financial transactions
- not easy to communicate necessity in application projects
- can we hope to get one common agreed set of upper ontologies (e.g., using EU PROTON results)?
- situational ontologies necessary for SOA in mobile services
- will be addressed by talk from Patricia Dockhorn et al.

General Ontologies for Research Areas

- wrapper ontologies – give general definitions for entities in a research area
- more general than a domain ontology, but less than an upper ontology
- e.g., for organizations and their tasks and working structures
- will be addressed by David Aveiro and Jose Tribolet

Dynamic Knowledge Repositories

- often, the role of ontologies is largely seen in supporting
 - semantic based search and
 - information federation
- but, given the success of Wiki, would it not be reasonable to have ontology-like structures for search here, as well?
- this would foster knowledge management (KM)
- in practice, KM requires fast adapting knowledge repositories than can be constantly updated cooperatively
- this will be addressed in talk by Axel Korthaus and Martin Schader

Part II

UML and Ontologies

Relationship of Ontologies to UML

- UML does have many constructs equivalent to ontology classes and relationships
- in addition, UML has advanced concepts like navigable associations, the distinction between composition and aggregation that imply many upper ontologies definitions
- finally, with the revised concept of Petri net like activity diagrams, UML 2 offers a seamless integration of domain ontologies with process definitions on domain classes affecting their relations
- however, exploring UML vs. OWL shows some deep differences that can, however, be brought back into a single common framework – invited talk by Colin Atkinson

Part III

BPM and BPR

BPM

- required **compliance** with new complex business regulations
 - in the internalization and globalization context
 - new requirements for business auditing, e.g. Basel II
- necessary are ontologies to link financial documents to service and regulation classes – EU project MUSING
- but need not just classes and relationships – need aligned business processes
- e.g., transaction needs to be audited by an external partner etc.
- this is the main driver in current BPM
- BPM engines are becoming standard components in most commercial application servers (like IBM webSphere, Oracle 10g, 10i, SAP Netweaver)
- EU project SUPER – link BPM to semantic representations of requirements

Business rules (BR) – just inference rules with a bow tie?

- BR are rules applied to business *processes* – look like inference rules but ...
- most BR must be checked during BP execution and not in an inference process outside a process instance
- the conclusions from checking a BR often have implications on the structure of the process – may force entering additional BPEL `<flow/>` elements with dynamically derived *transition conditions*
- often in effect similar to AOP intercepting
- forthcoming diploma thesis of chair M. Spies by T. Graml in cooperation with IBM

BPM and BPR

- we are used to workflow-centric BP descriptions – but compliance management demands more
- general goal would be – deduction of a process description from atomic services (one port type) plus *business rules* expressing goals, pre-/postconditions and actions
- – result should be expressed in BPEL-like process execution language –
- in MDA terms, we are looking for a PIM level definition and a PIM to PSM BP language generator
- Kuldar Taveter will present a new methodology to generate process descriptions from semantic rules in an action based approach

BPM and BPR

- BP execution oriented languages are not well suited to describe BPs in terms of requirements, e.g.
 - QoS,
 - security,
 - information forwarding and book-keeping duties
- Fernando Naufel et al. show a specific approach for the definition of process security constraints given textual security requirements

Issues concerning Business Rules

- Dynamic BP configuration is highly demanding in terms of correlation sets and synchronisation of updated process descriptions – fully functional prototype ADEPT from Peter Dadam chair, Ulm University
- but, in practice, dynamic or agile BPs are just emerging – for specification in business, BPMN with rule transitions is reasonable
- how important will the use of inference engines be? Is it sufficient to have rule checking and branching to different processes?
- related to this – what is an adequate representation language? IBM CommonRules and Grosf's SweetRules exhibit many options
- new standard SBVR by OMG not yet widely adopted