Semantic-ontological combination of Business Rules and Business Processes in IT Service Management

Alexander Sellner¹, Christopher Schwarz¹, Erwin Zinser¹

¹FH JOANNEUM University of Applied Sciences, Graz, AUSTRIA
Focusing on IT Service Management (ITSM)

- **ITSM:** Alignment of IT Services with business processes and organizational requirements
- **IT Service**
  - Any expendable IT-based activity
  - Composition of hardware & software
  - Usually decomposable into multiple components
- **Goals:**
  - Establish measurable IT performance indicators
  - Improve manageability of IT systems
- **Benefits:**
  - Agile and adaptive systems (competitive advantage)
  - Transparency in chargeability
IT Service Catalogue – a famous example for „the gap“

- **Business-IT gap**
  - Management perspective vs. IT perspective
  - Seamless integration of business processes

- **Service Catalogue Management**
  - Process of managing IT-related services
  - Contains various elements
  - Based on ITIL v3

- **Elements**
  - Request for Change (RFC)
  - Service Instances (SI)
  - Service Level Agreement (SLA)
  - Maintenance Contract (MTC)
  - All items contained in the Configuration Management Database (CMDB)
Borders of the IT service catalogue

- **Business Service Catalogue**
  - Customer-facing list of services
  - Facilitated selection & composition

- **Technical Service Catalogue**
  - Internal resource description
  - Specifications & technical details

- Broken down into Layers
- Loosely coupled elements
- Multitude of legal agreements
- Paradigm of inheritance
Establishing a multi-layer perspective

- **Package Layer**
  - Overall service package
  - Aggregated financials
  - Categorization

- **Module Layer**
  - SLAs & MTCs
  - “Levels of Quality”

- **Resource Layer**
  - Operating Level Agreement
  - Underpinning Contract
  - Service Instances

- **Deployment Layer**
  - Deployment Processes
  - Tracking & Automation
Semantic ITSM

- Relations between configuration items (CIs)
  - Parent-child relations
  - Bidirectional wording

- Organizational dictionary
  - Semantic ITSM environment
  - Basis for transition to ontologies
  - Impact on data model
Utilizing semantic queries

**Goals**

- Make services machine-discoverable
- Ensure consistency within service tree
- Express restrictions
- Extend data schema
- Basis for “ITSM ontology”

**RDF statement**

ci = (http://cmdb.fh-joanneum.at/ima/ci#)

ci : host rdfs : subClassOf ci : system

**OWL Statement**

object : nt a owl : Class; rdfs : subClassOf

[ a owl : Restriction;
  owl : allV aluesF rom object : hostresource;
  owl : onProperty link : container_f ]:

**Topic map**

topics:

- Commands::
  - "rmdir",
    association => a("is command of", "Unix", "has command");

- System Function::
  - "rmdir",
    association => a("is system call in", "Unix", "has system function");
Incorporating Ontologies

- **Bottom up approach (utilize already existing database model)**
  - Add semantic expressions as relationship attributes
  - No severe modifications to Db model
- **Mapping**
  - Relational Db <-> Topic Map
- → **CMDB as Ontology**
Application of rules - Inheritance within Service Trees

- Inheritance of SLAs and MTCs
- Service items used multiple times within different RFCs
Integrating SBVR-based rules using DBMS triggers for execution

- **Three types of rules within complex ITSM service trees:**
  - 1. Prevent adding new SLAs or MTCs (inconsistencies or negative business impacts)
  - 2. Analyze and improve existing SLA and MTC structure
  - 3. SLAs definitions (legal statements)

- **Event-Condition-Action rule “in a box”**

**Structured English statement:**

T: SLA
T: SVC
T: total fines
F: SLA has total fines
F: SLA is linked to SVC
NR: For an SLA that is linked to an SVC it is obligatory that the total fines of the new SLA are less than the total fines of the old SLA.

**SQL expression:**

```
CREATE TRIGGER "NR1" BEFORE UPDATE OF "SLA_id"
ON "SLA-is_linked_to-SVC"
WHEN NOT
(SELECT "total fines" from "SLA" where id=new.SLA_id)<
(SELECT "total fines" from "SLA" where id=old.SLA_id)
BEGIN
SELECT RAISE(ABORT, "Requirement of NR1 not met");
END;
```
Challenges

Layered ITSM service tree
- Procedure for SLA prioritization (use of business intelligence?)
- Close investigation of paradigm regarding ITSM service tree inheritance
- Optimization of complex service trees (customer’s vs. IT provider’s perspective)

Involvement of semantics
- Challenge towards the underlying data model
- Verbalizing MTC/OLA/UC-related statements
- Requirements of SBVR must be met by database models
- SBVR to SQL conversion requires strongly controlled natural language
Referring to the procedure model for ontological BPM & BRM

- Independent modeling of business processes and rules
- Establish (reference) enterprise ontology
- Allow seamless IT integration

Semantic-ontological combination of BR and BP in ITSM – Sellner, Schwarz, Zinser
Academic Background

Research group - Enterprise Engineering & Integration

Publication

*Establishing conceptual and functional links between S-BPM and business rules* (Sellner, Zinser)

*A procedure model for combining business rules and processes within ontologies* (Sellner, Paschke, Zinser)

PhD Theses

- Linking BPM and BRM through enterprise ontologies (Alexander Sellner)
- Semantic Outsourcing Relationship Management (Christopher Schwarz)

Student projects/theses

- Implementation of Semantic Outsourcing Relationship Management
- Semantic IT Service Management (Bachelor Thesis - Mathias Schreiner)
Thank you!

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