“Semantics of Business Vocabulary & Business Rules”

W3C Workshop on Rule Languages for Interoperability
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Rules Standards for Business & Information System Modeling

Metamodels that built on:
- Production Rules
- OCL
- RDBMS Triggers
- ...

Two-Way MDA Transformations

Business Customer ↔ IT Supplier

Business Rules Team’s
“Semantics of Business Vocabulary & Business Rules”

Business Modeling

Information System Modeling

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An SBVR “Business Vocabulary+Rules” is Owned by the Business \textit{and NOT IT}:

- **ABOUT the Business**
  - NOT the \textit{Information System} or \textit{Recordkeeping System} – manual or automated

- **FOR Business purposes** – the capability to run the business
  - NOT directly for \textit{Information System} building purposes

- **FROM a Business perspective** – the perspective of Business stakeholders
  - NOT from an \textit{IT / Information System} perspective

- **IN the actual language used by Business staff** – to talk to each other
  - NO reference to any \textit{Information System} construct – independent of any implicit or explicit information system consideration or design decision

- **BY the Business** – created & maintained by Business staff
  - Contents NOT the responsibility of \textit{Information Systems} staff – not owned by IT
SBVR: A Synthesis of Four Established Disciplines

1. VOCABULARY STANDARD:

2. BUSINESS PRACTICE:
   - BRG’s “Structuring Business Vocabularies for Business Rules”

3. FORMAL LOGICS:
   - Halpin’s “Object Role Modeling (ORM) for the Business”

4. LINGUISTICS & COMMUNICATION:
   - Unisys’ “Linguistic Expression of Business Rules Based on Exchangeable Vocabularies”
Overview of SBVR

Community
Sub-communities may use different natural languages and specialized vocabularies

Body of Shared Meanings
Concepts (including Fact Types) and Business Rules

Semantic Formulation
Abstract formulation of semantics

Business Expression
Expression of Body of Shared Meanings in Business Vocabulary

Formal Logic
First-Order Predicate Logic with some (limited) extensions

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Key SBVR New Contribution -- Semantic Formulation

- What it’s not
  - Not a language for stating business rules
  - Not a language for stating constraints
  - Not about software design

- What it is
  - Language for talking about meanings of concepts and rules
    - regardless of the languages or notations used to state them
  - A way of **structuring** the **meaning** of:
    - Definitions
    - Rules that govern the operation of an organization
    - Questions (Queries)
  - **Optimized for people and natural language** – not for machine processing
  - Interpretable in formal logics: 1st order and restricted higher order
  - Recursive

- Scope: Whatever business people mean by the vocabularies they use and the rules they make

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Semantic Formulation of a Simple Rule

Each rental car always has exactly one vehicle identification number.

Necessity Claim

Universal Quantification

Exactly-One Quantification

Variable (rental car)

Variable (vehicle identification number)

Atomic Formulation (rental car has vehicle identification number)

Rule

A position paper for this workshop, “Semantic Formulations in SBVR,” is available on the workshop website.

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XML for Logical Formulation

<is-obligation-claim obligation-claim="oc"/>
<modal-formulation-embeds-logical-formulation modal-formulation="oc" logical-formulation="n"/>
<is-existing-quantification existential-quantification="eq"/>
<quantification-introduces-variable quantification="eq" variable="v2"/>
<variable-has-type variable="v1" type="bdt"/>
<quantification-scopes-over-logical-formulation quantification="eq" logical-formulation="eq2"/>
<is-existing-quantification existential-quantification="eq2"/>
<quantification-introduces-variable quantification="eq2" variable="v2"/>
<variable-has-type variable="v2" type="rt"/>
<quantification-scopes-over-logical-formulation quantification="eq2" logical-formulation="af"/>
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<atomic-formulation-has-role-binding atomic-formulation="af" role-binding="rb1"/>
<role-binding-is-of-fact-type-role role-binding="rb1" fact-type-role="ftr1"/>
<atomic-formulation-has-role-binding atomic-formulation="af" role-binding="rb2"/>
<role-binding-is-of-fact-type-role role-binding="rb2" fact-type-role="ftr2"/>
<esbr:thing xmi:id="oc"/> <esbr:thing xmi:id="n"/> <esbr:thing xmi:id="eq"/>
<esbr:thing xmi:id="v1"/> <esbr:thing xmi:id="bdt"/> <esbr:thing xmi:id="eq2"/>
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Relationship to Rule Exchange and Interoperability

SBVR
- Vocabulary
- Business Rules

Human Activity System
- Rules Actioned by People

Business Model

UML Class Model / ER Model
Production Rules
Database triggers
Procedural logic

Database
COTS

Not just for automated rules
Including rules about rules

IT Specification

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Contribute to / Require from Rule Language for Interoperability

- Rules build on Vocabulary (Facts which Build on Concepts)
- No Rule Interoperability --
  - without Vocabulary Interoperability
  - Consistent vocabulary also applies to business process, organization roles and work flow, business geography and logistics ...

- Meaning separate from Expression –
  - specialized vocabularies, multilingual
  - must support synonym & homonym terms

- Semantic Formulations – bridge people & computer
  - Structure the meaning of
    - Definitions -- CONTENT / DATA
    - Operational Rules -- SERVICES
    - Questions / Queries

- Use approach of Semantic Formulations with RDF and OWL
  - Optimized for machine processing
Vocabulary+Rules Framework for the Semantic Web

SBVR -- Business Vocabulary (about Business Things)
RDF / OWL -- (about Business Things)
RDF / OWL -- (about Content / Data)
Web Service XML Schema, Relational, Legacy Wrapper, ...

Rules defined in terms of:
Transform First
Transform Second

Semantic Formulations
(Structures optimized for machine processing)

SBVR -- Business Rules (Semantic Formulation structures optimized for people)

Platform-Independent Model (PIM)
Class of Platform Model (PIM)

Business Model (Optimized for People)

IT System
Computation Independent Model (CIM)
(Optimized for Machines)
Questions?
Supplemental Slides
SBVR

- “Semantics of Business Vocabulary and Business Rules” - Business Rules Team (BRT) response to OMG RFP for BSBR

- Positioned in MDA as part of Business Model
  - Rules for people in real-world businesses
  - Vocabularies for expression of business rules

- Not IT system specification
  - Transformations will be needed

- Might provide vocabulary basis for whole business model (business process, organization …)
Business Rules Team (BRT)

- Consortium formed especially to respond to BSBR RFP
- 18 Organizations from 7 countries
- Three of the proposers are also proposers for OMG’s Business Process Definition Metamodel (BPDM)