

Business Rules

September 2005



Stan Hendryx

CEO
Hendryx & Associates
CoChair of the
OMG's BEIDTF
(Business Enterprise Integration
Domain Task Force)

stan@hendryxassoc.com

www.bptrends.com

On one of the mailing lists I monitor, someone recently asked the question that is the title of this article, and that triggered an interesting discussion thread. It is not surprising to discover that the concept of “rule” divides into many categories, some defined, many others undefined, and many overlapping. There seems to be general agreement that a rule is some kind of constraint. However, that answer prompts other questions such as “What kind of constraint is it?” “Who or what is constrained?” “What is the constraining mechanism?” “How is a rule expressed?” “What is the meaning of a rule?” It seemed that these concerns would make a good topic for this month’s article, especially if approached from the perspective of the OMG Semantics of Business Vocabulary and Business Rules (SBVR) proposal.

In SBVR, a constraint on an enterprise is called a “directive.” Some directives are actionable and others are not. For example, the directive, “Each renter must have a valid driver license” is actionable: Someone can take direct action to enforce this by asking each renter to show his or her driver license. On the other hand, the directive, “Maximize profit” is not directly actionable.

Directives that are not actionable are nevertheless important in business, to guide an enterprise. Such a non-actionable directive is called in SBVR a “business policy.” Actionable directives are often justified by business policies.

If a directive is actionable with a purpose to advise or inform toward a goal of resolving a problem or difficulty, especially if given by someone in authority, the directive is called in SBVR an “element of guidance.” A “rule,” then, is an element of guidance that introduces either an obligation or a necessity. If a rule is under the jurisdiction of the business that is applying the rule, it is called in SBVR a “business rule.”

SBVR includes the concepts “admonition” and “affirmation,” which are elements of guidance that there is no obligation or necessity where, by custom or practice, one might be assumed, or, that there is a permissibility or possibility where, by custom or practice, one might not be assumed. Admonitions and affirmations serve to clarify business rules and prevent erroneous presumptions about non-existent rules.

A business rule that an organization seeks to impose on another business may be the subject of a business policy of the other business but is not itself a business rule of the other business. Laws and Government regulations are examples of such third party business rules. Businesses commonly have business policies and business rules that relate to their compliance with laws and regulations that apply to them.

A business rule that introduces an obligation is called in SBVR an “operative business rule.” An operative business rule is intended to produce an appropriate or designed effect that covers conduct, action, practice, or procedure within a particular activity or sphere of the business. It is generally the obligation of some person or persons in the business to observe and enforce the rule, sometimes with the aid of an information system or other tools.



Business Rules

by Stan Hendryx

September 2005

Ron Ross made this important observation about operative business rules:

The important point in distinguishing business rules where real people are involved, as opposed to pure knowledge, is that people can break the Operative (deontic) rules. This has important consequences for reasoning over such rules. In particular, it can't be assumed that the rule has always been followed, and that the state (of the business or knowledge about it) reflects strict conformance. It's important – critical – that any taxonomy of rules for business people (where many rules aren't even automatable) take this fundamental fact into account.

“Deontic” means, in linguistics and philosophy, expressing or relating to duty and obligation. Explicit attachment of the deontic mode to operative business rules and recognition of the possibility that operative business rules can be violated distinguishes the treatment of business rules in SBVR from most other rule treatments, especially treatments of rules in technical languages.

Distinct from “business rule,” SBVR includes “structural rule” and “structural business rule,” which are intended as definitional criteria. Structural rules, called “alethic” in linguistics and philosophy, include the modality of necessity, and are stipulations that the business makes about its logical structure. For example, the structural business rule, “It is necessary that each order total include applicable tax” specifies one aspect of an “order total” of the business. Structural rules, unlike operative business rules, cannot be violated, because they are definitional.

To understand how it is that a structural rule cannot be violated, consider that enforcement of a rule is separate from the rule itself. Enforcing a rule becomes an obligation on a business system that is tasked with that responsibility. “But,” one might say, “it is possible that some order total does not include the tax.” This brings out the difference between a rule – that each order total includes tax – and enforcement of the rule – making sure that each order total written includes the tax.

A business rule that specifies an obligation to enforce another business rule is a “requirement” on an enforcement system. In other words, a system requirement is a rule about the enforcement of a business rule by the system. “Requirement” includes both functional requirements and non-functional requirements, such as performance, availability, and capacity, as subtypes. A business system – manual or automated – may fail in its duty to include the tax in an order total, but that is a failure of the system to meet the requirement; the structural business rule still holds. SBVR does not include “requirement” in its lexicon; rather, being a requirement is a role of a business rule in some conceptual schema of the business that relates the business to a manual or automated system for the business.

SBVR might be used to write a set of requirements for a business system based on business rules to be enforced by the system. SBVR does not include means for describing how rules are to be enforced. SBVR includes “level of enforcement,” that represents a position in a graded or ordered scale of values that specifies the severity of action imposed in order to put or keep a [business rule](#) or business



Business Rules

by Stan Hendryx

September 2005

policy in force. How rules are to be enforced by manual or automated business systems is the subject of business process models.

In SBVR, rules are modal propositions that express either an obligation (deontic mode) or a necessity (alethic mode). Rules build on “terms” for concepts and “forms of expression” for fact types. However, the same language can be used in SBVR for expressing rules and for expressing concepts and fact types. Modal operators in the language, such as “must” in English to indicate obligation, indicate the rule modes. In SBVR, the languages that are used to express terms, forms of expression, and rules are usually considered to be fragments of natural language. For example, SBVR Structured English, defined in an appendix of the specification, is a non-normative fragment of English used to express the propositions of SBVR itself. RuleSpeak is another defined English fragment that is somewhat more business-friendly than SBVR Structured English. Quantifiers and logical operators are also included in these languages, in addition to modal operator keywords.

Business meaning is captured separately from expression in SBVR. Different terms are used in SBVR to denote expression and meaning. For example, a “term” on the expression side corresponds to a “concept” on the meaning side; a “form of expression” on the expression side corresponds to a “fact type” on the meaning side.

Meaning is captured in SBVR through a kind of structure called a “semantic formulation.” A semantic formulation is not the translation of an expression into some logic language. A semantic formulation is not a well-formed logical formula. Rather, a semantic formulation is the representation of the meaning of an expression in terms of logic meta-concepts defined in SBVR. Semantic formulations are based on first order predicate logic and restricted higher order logic, with deontic and alethic modal extensions. Semantic formulations can describe sets, multisets, and arithmetic. Different expressions (possibly in different languages) may have the same semantic formulation, making it possible to reconcile concepts, fact types, and rules from different sources based on their semantic formulation (meaning) where their expression may differ. This powerful capability in SBVR will facilitate its use for semantic integration across enterprise and natural language boundaries.

SBVR groups concepts and fact types into a “vocabulary,” which is usually segregated from related rules. A SBVR “conceptual schema” is a combination of concepts and facts (with semantic formulations that define them) about what is possible, necessary, permissible, and obligatory in each possible world. A SBVR “conceptual model” is a combination of a conceptual schema and, for one possible world, a set of facts (defined by semantic formulations using only the concepts of the conceptual schema). A conceptual model satisfies each necessity of a conceptual schema, but obligations are not necessarily satisfied.

SBVR provides a MOF model of semantic formulations having a representation in XMI. The MOF model represents each concept, fact type, and rule as a series of facts that describe their semantic formulations. SBVR vocabularies and rules are interchanged by interchanging the XMI.



Business Rules
by Stan Hendryx

September 2005

The task of formalizing the logical foundations of SBVR has taken an extra OMG meeting cycle to complete. It now appears that SBVR is headed for adoption as a formal adopted specification at the OMG meeting in Atlanta in September.

