SBVR – Structured English Notation

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SBVR Structured English Notation

There are four font styles with formal meaning:

term	The 'term' font is used for a designation for a noun concept (other than an individual concept), e.g. rental car, branch
Name	The 'name' font is used for a designation of an individual concept — a name. Names tend to be proper nouns, e.g. California, 25
verb	The 'verb' font is used for designations for verb concepts — usually a verb, preposition or combination thereof. Such a designation is defined in the context of a form of expression, e.g. local area owns rental car, rental has pick-up branch
keyword	The 'keyword' font is used for linguistic symbols used to construct statements – the words that can be combined with other designations to form statements and definitions, e.g., 'each' and 'it is required that'.
	Quotation marks are also in the 'keyword' font. Single quotation marks are used (among other purposes) to mention a concept – to refer to the concept itself rather than to the things it denotes. In this case, a quoted designation or form of expression is preceded by the word 'concept' or by a term for a kind of concept, e.g. the concept 'walk-in_rental' is a category of the concept 'rental'.

SBVR Structured English – An Example

It is obligatory that each <u>rental car</u> is owned by exactly one <u>branch</u>.
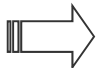
Keywords for
a modality

Quantifier

Designation for
a noun concept

Designation for
a fact type

Quantifier

Designation for
a noun concept

(Chapin & Hall 2006)

SBVR Structured English – Modal Operations

it is obligatory that p	obligation formulation
it is prohibited that p	obligation formulation embedding a logical negation
it is necessary that p	necessity formulation
it is impossible that p	necessity formulation embedding a logical negation
it is possible that p	possibility formulation
it is permitted that p	permissibility formulation

The following key words are used within expressions having a verb to form verb complexes that add a modal operation.

… must …	obligation formulation
… must not …	obligation formulation embedding a logical negation
… always …	necessity formulation
… never …	necessity formulation embedding a logical negation
… may …	permissibility formulation

SBVR Structured English- Quantification

each	[universal quantification](#)
some	[existential quantification](#)
at least one	[existential quantification](#)
at least n	[at-least-n quantification](#)
at most one	[at-most-one quantification](#)
at most n	[at-most-n quantification](#)
exactly one	[exactly-one quantification](#)
exactly n	[exactly-n quantification](#)
at least n and at most m	[numeric range quantification](#)
more than one	[at-least-n quantification](#) with $n = 2$

SBVR Structured English – Logical Operations

it is not the case that p	logical negation
p and q	conjunction
p or q	disjunction
p or q but not both	exclusive disjunction
if p then q	implication
q if p	implication
p if and only if q	equivalence (see exception explained under Modal Operations below)
not both p and q	nand formulation
neither p nor q	nor formulation
p whether or not q	whether-or-not formulation

SBVR Structured English – Modal Operations

The key word phrase "only if" is used in combination with some of the key words and phrases shown above to invert a modality.

… may … only if p is equivalent to   … must not … if not p

it is permitted that q only if p is equivalent to   it is obligatory that not q if not p

it is possible that q only if p is equivalent to   it is necessary that not q if not p

For example, the following two statements have the same meaning.

A car may be rented only if the car is available.

A car must not be rented if the car is not available.

The key word "only" can also be used before a preposition in combination with "may" to invert a modality. The noun phrase after the preposition is then understood as a negated restriction as shown in these two equivalent statements:

A car may be rented only to a licensed driver.

A car must not be rented to a person that is not a licensed driver.

Because of the use of "only" in stating modal operations, the pattern "p if and only if q" for equivalence is not used if p involves a modal operation.

SBVR Structured English – Other Keywords

the
1. used with a designation to make a pronominal reference to a previous use of the same designation. This is formally a binding to a variable of a quantification.

2. introduction of a name of an individual thing or of a definite description

a, an
universal or existential quantification, depending on context based on English rules

another
(used with a term that has been previously used in the same statement) existential quantification plus a condition that the referent thing is not the same thing as the referent of the previous use of the term

a given
universal quantification pushed outside of a logical formulation where 'a given' is used such that it represents one thing at a time – this is used to avoid ambiguity where the 'a' by itself could otherwise be interpreted as an existential quantification. Within a definition, 'a given' introduces an auxiliary variable into the closed projection that formalizes the definition.

that
1. when preceding a designation for a noun concept, this is a binding to a variable (as with 'the')

2. when after a designation for a noun concept and before a designation for a fact type, this is used to introduce a restriction on things denoted by the previous designation based on facts about them

3. when followed by a propositional statement, this used to introduce nominalization of the proposition or objectification, depending on whether the expected result is a proposition or an actuality. See C.1.5.

who
the same as the second use of 'that' but used for a person

is of
The common preposition "*of*" is used as a shorthand for "that *is of*." For any sentential form that takes the general form of '<u>\<placeholder 1\></u> *has* <u>\<placeholder 2\></u>' there is an implicit reversed form of '<u>\<placeholder 2\></u> *is of* <u>\<placeholder 1\></u>' that has the same meaning.

what
used to introduce a variable in a projection as well as indicate that a projection is being formulated to be considered by a question or answer nominalization. See C.1.5 below.