What Exactly is a Business Rule?

Business Rule Solutions

October 2005

Ronald G. Ross
Principal,
Business Rule Solutions, LLC
Executive Editor
Business Rules Journal
www.BRCommunity.com

Author: *Business Rule Concepts: Getting to the Point of Knoweldge*

rross@brsolutions.com

Rules apply to a broad spectrum of needs. To illustrate, consider the following situation that might occur in a baseball game. Suppose it is the bottom of the seventh inning, with two outs, two strikes on the batter, and two base runners. The score is tied. The batter is left-handed.

- A validation rule might ensure the batter still gets only three strikes even if the pitcher is changed.
- A computation rule might compute the batter's hit percentage in similar prior circumstances.
- Inference rules might help choose the best relief pitcher.

Rules cover all such needs, and more. They offer a unified approach to capturing, evaluating, and managing the spectrum of operational guidance.

Do rules fall into fundamental categories? Fortunately, yes. But first the answer to: What exactly is a business rule?

What is a Business Rule?[1]

A business rule is simply a rule that is under business jurisdiction. Under business jurisdiction is taken to mean that the business can enact, revise, and discontinue their business rules as they see fit. If a rule is not under business jurisdiction in that sense, then it is not a business rule. For example, the 'law' of gravity is obviously not a business rule. Neither are the 'rules' of mathematics.

The more fundamental question in defining business rule is the meaning of rule. Clearly, rule carries the sense of guide for conduct or action both in everyday life and in business. One way or another, this sense of rule can be found in most, if not all, authoritative dictionaries.

Examining the matter more closely, if rules are to serve as guides for conduct or action, they must also provide the actual criteria for judging and guiding that conduct or action. In other words, for the context of business rules (and probably in most other contexts), rules serve as criteria for making decisions. A business definition of rule therefore encompasses the sense of criteria as given by authoritative dictionaries.

Business rules are just part of the larger issue of how guidance is created and delivered within business (sometimes called, or considered part of, the governance process.) Figure 1 presents an overall categorization of guidance from the perspective of business people. From that perspective, all rules are either operative or structural, as discussed below.

---

[1] Much of this subsection is based on: *Semantics of Business Vocabulary and Business Rules* (SBVR), by the Business Rules Team, August 2005. Available at http://www.omg.org as bei/2005-08-0: BRT's revised submission to the Object Management Group's (OMG) *Business Semantics of Business Rules* RFP. For background on the SBVR and the consortium that produced it, refer to "A Brief History of the Business Rule Approach," *Business Rules Journal*, Vol. 6, No. 1. Available at http://www.BRCommunity.com/a2005/b216.html

Business Rule Solutions

by
Ronald G. Ross

October 2005

Compared with a business policy, a rule needs to be actionable. This means that a person who knows about a rule could observe a relevant situation (including his or her own behavior) and decide directly whether or not the business was complying with the rule. In general, a business policy is not actionable in that sense; policy must be interpreted into some more concrete business rule(s) that satisfy its supposed intent. For example the following business policy is not actionable: Safety is our first concern. Note the fact type in Figure 1: Business Rule is derived from Business Policy.

For a rule or other element of guidance (e.g., an affirmation or admonition) to be actionable assumes that the business vocabulary on which it is based has been adequately developed, and has been made available as appropriate. Note the fact type in Figure 1: element *of guidance is* based on fact type. In the business rule approach, all elements of guidance are based on a structured business vocabulary. Rules and other elements of guidance are established on top of that vocabulary in building-block fashion. In the words of the 'business rules mantra' (an easy to remember simplification): rules build on facts, and facts build on terms.

Just because rules are actionable does not imply they are always automatable — many are not. For instance, consider the (actionable) rule: A hard hat must be worn in a construction site. Non-automatable rules need to be implemented as user activity, and supported by procedure manuals or rulebooks. In many ways, managing non-automatable rules is an even more urgent matter for the business than managing automatable ones.

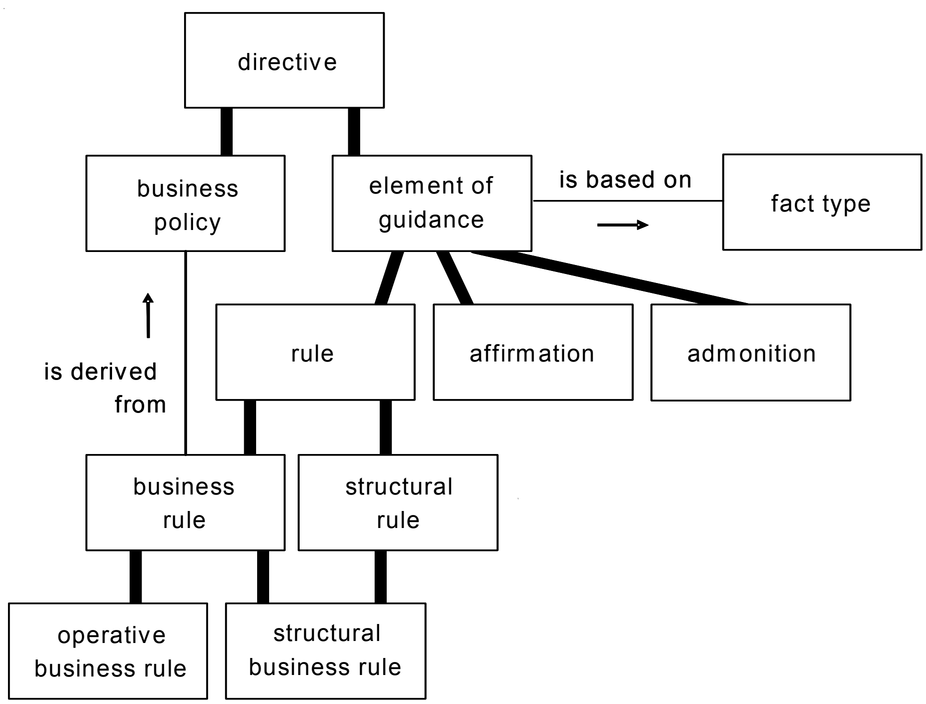

Figure 1. Categorization of business guidance [1]

Business Rule Solutions

by
Ronald G. Ross

October 2005

Operative Rules

Consider the rule: *A gold customer must be allowed access to the warehouse*.[4]

Aside: Since this discussion is informal, I will use the word rule instead of the more correct rule statement to refer to expressions of rules. The distinction is that the same rule can be given by statements in different forms and/or by statements in different languages (for example, French, Mandarin, and so on). In other words, there can be many different rule statements for exactly the same rule. The same holds true for affirmations and admonitions.

Clearly the rule above can be violated. If a gold customer is denied access to the warehouse (assuming there are no extenuating circumstances, such as exception rules), then a violation has occurred. Presumably, there is some sanction(s) associated with such violation — for example, the security guard might be called on the carpet.

Any rule that can be violated *directly* by people involved in affairs of the business is an *operative rule*. Operative rules govern the on-going conduct of business activity, always carrying the sense of *obligation* or *prohibition*. To reflect that sense, BRS *RuleSpeak*® prescribes the rule keywords *must* or *only* to express operative rules.

Aside: RuleSpeak® is a business rule notation developed by Business Rule Solutions, LLC (BRS) that has been used with business people in actual practice in large-scale projects since the second half of the 1990s. Refer to *Principles of the Business Rule Approach*, by Ronald G. Ross (Addison-Wesley, 2003, Chapters 8-12).

One way or another, operative business rules are always preventative, as the following examples illustrate.

- *Surgical gloves must be worn in performing surgery.* This rule is intended to prevent infections.
- *A nurse must visit a patient at least every 2 hours.* This rule is intended to prevent inattention to patients.
- *A gold customer must be allowed access to the warehouse.* The rule is intended to prevent any denial of access.

Operative business rules enable the business to run (i.e., to operate) its activities in a manner deemed suitable, optimal, and/or best aligned with its goals. Operative rules deliberately preclude specific possibilities (of operation) that are deemed undesirable, less effective, or potentially harmful. Often, sanction is real and immediate if an operative rule is broken.

All operative rules are business rules. Operative rules are a distinctive feature of the business rule approach.

Aside: Because operative rules can be broken, they require special treatment by formal logic. For example, consider the operative rule: *A gold customer must be allowed access to the warehouse.* It cannot be assumed that the rule has always been faithfully enforced; therefore, it cannot be inferred that in every situation where it was appropriate for a gold customer to be allowed access to the warehouse, the customer actually *was* allowed such access. In other words, certain kinds of *reasoning* must be carefully restricted for operative rules.

Operative rules have significant (and perhaps surprising) consequences for business processes — that is, for how work should be organized. A key question in that regard is how the business *selectively* responds to violations of particular rules (if at all!). This, in turn, raises the issue of how strictly each operative rule should be enforced — that is, its appropriate *level of enforcement*. There is much more to discuss in that regard, but I will save that for a future column.

Structural Rules

Additional rules would be relevant to evaluating the operative rule: *A gold customer must be allowed access to the warehouse*. Specifically, what criteria should be used for determining whether a particular customer is *gold* or not? Here is an example: *A customer is always considered a gold customer if the customer places more than 12 orders during a calendar year.*

Such rules are called *structural rules*. Structural rules are about how the business organizes (i.e., *structures*) its basic knowledge, always carrying the sense of *logical necessity* or *impossibility*. To reflect that sense, *RuleSpeak®* prescribes the rule keywords *always* or *never* to express a structural rule. Unlike operative rules, not all structural rules are business rules. The reason is that not all structural rules are under business jurisdiction. As mentioned, the 'law' of gravity is obviously not under business jurisdiction. Neither are the 'rules' of mathematics.

If a customer appears at the warehouse, but the security guard is unaware of the criteria expressed in the structural rule, or misapplies the criteria, quite possibly the customer will not be given due access. The error, however, manifests itself in the form of a violation of the operative rule, *not* the structural rule(s) per se. Structural rules can be ill-conceived, misunderstood, or misapplied, but they cannot be directly violated.

Structural business rules enable the business to create (i.e., to *structure*) its own private world of encoded knowledge. They give shape (i.e., *structure*) to core concepts of the business by precisely establishing clear lines of demarcation for each. They also allow the business to extrapolate its knowledge in a highly organized (*structured*) fashion via inference and computation rules. During business activity, structural rules are used to evaluate 'where you are' (current state of affairs) as the need arises. For example:

- Is this customer a gold customer or not?
- Do we owe this customer a discount on this order?
- Does this patient have cat scratch fever or something else?

The conclusion reached in each case is only as good as the guidance within the rules. Poor or misapplied guidance yields poor or inconsistent results. In that case, some aspect of the encoded knowledge 'breaks down' — it simply does not work properly.

This is a fundamental difference between operative rules and structural rules. Disregard for operative rules leads to violations and possible sanctions; misapplication of structural rules leads to mistakes and undesirable results — but only indirectly, if at all, to violations.

Structural Rules and Definitions

Based on the discussion above, it would seem that structural rules, in contrast to operative rules, are more 'definitional' in nature. In a general sense, that is true. In practice, however, a clear distinction nonetheless can and should be maintained between definitions and structural rules.

A good definition focuses on the essence of a concept — the core meaning of the concept to the business. Structural rules, in contrast, indicate the exact lines of demarcation — that is, the precise 'edges' of the concept. In other words, structural rules provide definitive criteria to determine when something is or is not an instance of a concept.

For example, consider an 'essence' definition of gold customer: a customer that does a significant amount of business over a sustained period of time. Now compare that with the associated structural rule: A customer is always considered a gold customer if the customer places more than 12 orders during a calendar year.

The definition provides the fundamental notion about what gold customer means to the business. It is unlikely that basic notion will change — in other words, the notion as defined in this manner is very stable. The structural rule, in contrast, gives specific criteria for determining whether a customer is or is not gold — criteria that quite possibly will change over time. In the business rule approach, any aspect of business knowledge subject to change should be treated as rules, not embedded in definitions.

Another difference between definitions and structural rules is that the latter frequently provide criteria that would not be so obvious from the definition, for example: A customer is never considered a gold customer if the customer has been incorporated less than a year.

Inference and Computation Rules

Structural rules such as those above — although they were not expressed in the form of if-then statements — actually represent inference rules.

Aside: The *if-then* form for the last rule, for example, is: *If a customer has been incorporated less than a year, then the customer is not a gold customer. RuleSpeak®* disfavors the *if-then* form for numerous reasons. For one thing, it is unnatural for expressing most operative rules. For structural business rules, the business need is generally focused more on defining the precise 'edges' of business concepts — definitional matters — rather than on extrapolating knowledge (i.e., if we know *this*, then we can know *that* for sure). That's not to say automated inferencing (reasoning based on inference rules), as in rule or inference engines, is not useful — *it most certainly is!*

A complex decision may involve hundreds of inference rules, or even more. Their evaluation, however — no matter how many rules are involved — cannot directly result in a violation. Although the result might be quite serious for the business — perhaps even calamitous — technically, no violation has occurred. The result would simply represent a really, really bad decision.

What about rules that express how to compute some mathematical result? Consider the following example: *The total price of an order item is always computed as the product unit price times its quantity.* This rule prescribes criteria for exactly how the result, *total price of an order item,* is to be computed. The rule can be evaluated to actually produce that result. The prescribed criteria might, of course, be inadequate or mis-specified, but that simply represents poorly developed guidance, not any violation. Computation rules are therefore also structural rather than operative.

What if someone attempts to calculate *total price of an order item* using some criteria other than that specified by the rule above. Wouldn't that be a violation?

If a rule has been specified for how to compute a named result, it must be assumed to 'win' over any other non-rule means to compute that given result. (Otherwise, why bother specifying the rule?!) So if some business worker(s) or IT developer(s) wish to calculate the result using other criteria, they can; they just need to name the result differently. For example, they might call their result *amount charged to customer for order item*. However, in that case the business would probably want an additional rule: *The amount charged to a customer for an order item must be equal to the total price of that order item.* This new rule clearly could be violated — it is therefore *operative*.

Suppose a salesman decides to give a special volume discount to a personal friend. Again, the original computation rule is merely for computing; it does not prohibit inappropriate conduct. For that, the business would need a separate (operative) rule — for example: *A special volume discount may be given only to high-volume customers.*

A Final Word

The centerpiece of the business rule approach is the notion of *Rule Independence* – rules expressed and managed separately from processes and procedures. The various principles underlying Rule Independence are enumerated in the *Business Rules Manifesto*. [2]

One consequence of Rule Independence is that business rules become an object of analysis and expertise in their own right — a new and exciting business competency. Another consequence can be dramatic simplification of processes. To borrow a popular IT buzzword, taking out the rules means processes become *thin*. That's exciting stuff for those of us who are true 'process' believers!

Business Rule Solutions

by
Ronald G. Ross

October 2005

Notes

This column is Excerpted from Chapter 5, *Business Rule Concepts: Getting to the Point of Knowledge* (Second Edition), by Ronald G. Ross, September 2005. ISBN 0-941049-06-X - www.BRSolutions.com - Reprinted with permission.

[1] The diagram in Figure 1 is called a fact model, which is used in the business rule approach to graphically portray structured business vocabularies. The diagram is read as a collection of sentence templates, called fact types, for example:

- *Business Policy is category of Directive*. (By convention, the heavy dark lines, reading from top to bottom, indicate "is category of".)
- *Business Rule is derived from Business Policy*.

For more on Fact Models, refer to Chapter 4 of *Business Rule Concepts: Getting to the Point of Knowledge* (Second Edition), 2005. www.BRSolutions.com

[2] *Business Rules Manifesto ~ The Principles of Rule Independence*, Business Rules Group, 2003. Available at http://www.BusinessRulesGroup.org (in English as well as translations to numerous other languages).