BUSINESS RULES SOLUTIONS RONALD ROSS
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A great impedance mismatch exists between SBVR / behavioral business rules vs. DMN / decision rules. At the heart of the mismatch is the issue of state-based vs. modeler-invoked evaluation of rules. No current technology addresses this problem – a huge gap (or big opportunity!) in the marketplace. It's time to move beyond limited-function decisioning systems to comprehensively rule-based business solutions.

The Great Rules Impedance Mismatch

Modeler-Invoked Evaluation of Rules

Evaluation of rules under OMG's Decision Model and Notation (DMN) is modeler-invoked. Evaluation of a set of designed rules occurs where and only where someone (a modeler or coder) indicates that the evaluation should occur, usually at some point in a process model.

Overtly-designated decisions points for evaluation of rules works well for the kind of business decisions where waiting as long as possible to make a decision tends to produce the best business results. Those are indeed important cases. One noteworthy variety is what I call *best-fit match problems*.[1]

Modeler-invoked evaluation does *not* work well for behavioral business rules (and many definitional rules as well). For these business rules, which are legion, not catching violations as early as possible – preferably as soon as they occur – can cause snowballing errors downstream in the work being conducted and therefore extensive *rework*.

An additional issue is that modeler-invoked evaluation depends on the ability / wisdom / good intentions of the modeler or coder to decide where (in a business process) to invoke the decision. In the age of AI, that just doesn't seem very smart. In any case, why should *anyone at all* be involved in the choice of where to evaluate rules (again, except in those select cases where it *can* provide better business outcomes)?!

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[1] "Best-Fit Decision Points ~ How They Fit into the Business Rule Approach", *Business Rules Journal,* Vol. 5, No. 7, (Jul. 2004), URL: http://www.brcommunity.com/a2004/b200.html

State-Based Evaluation of Rules

Visualize a soccer game. Behavioral rules (no tackling from behind, offside, etc.) are basic to the game. Formal soccer games always feature a referee, watching the game close-up but not actually part of the play. When this 'watcher' sees a violation, s/he stops the on-going activity, resets the play, and issues a warning or penalty. If you left the monitoring of rules to the players, just imagine the chaos! (Yes, the referee presumably does have some sort of decision process or mechanism in his/her head to decide when a violation has occurred, but that abstracts the basic issue of the behavioral rule itself being violated several steps too far.)

In state-based evaluation of rules, current states of affairs are captured and monitored in real-time by a 'watcher' external to processes. This 'watcher' automatically intervenes whenever a violation of a rule occurs. The watcher resets the activity – i.e., the state of affairs is corrected if possible, some sanction(s) are perhaps issued, messages are possibly sent, procedures may be invoked, etc.[2] By this means errors are corrected automatically and ASAP, so they don't compound themselves downstream.

No modeler or coder has to indicate when state-based evaluation of rules is to occur – the external watcher is completely automatic. State of affairs reigns supreme. What a boost to productivity! It also makes evaluation of rules very smart. What do I mean by *watcher* and *state of affairs*? The watcher is some kind of software platform – possibly a rules engine; in an SBVR-style approach[3] the state of affairs would be a factbase.[4]

Another reason state-based evaluation is so important is that the great majority of behavioral business rules can be violated at *multiple* events. Consider the simplest example you could possibly imagine:

> Behavioral Business Rule: *An employee must have a name.*

The obvious event where this rule could be violated is upon first learning an employee exists. According to the rule, he/she must have a name from the onset. (You might say some decision is involved at that point, but it's not really a natural or basic one. It's certainly not a *rich* business decision.)

Far less obvious is the fact that if anyone tries to remove or discontinue the name of an *existing* employee, that too produces a violation of the rule. Catching violations at this second event is just as important as at create-time in maintaining valid state of affairs. What 'decision' does this second event correspond to? Certainly not anything

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[2] "Breaking the Rules: Breach Questions", *Business Rules Journal,* Vol. 14, No. 2, (Feb. 2013)

URL: http://www.brcommunity.com/a2013/b688.html

[3] For explanation and discussion of SBVR, refer to the *SBVR Insider* section under Standards on www.BRCommunity.com.

[4] USoft implemented such an approach over two decades ago using SQL databases.

remotely obvious. Even if there were one, however, why depend on a modeler or coder to ensure that the 'decision' is invoked? That's *definitely* not smart.

This example is by no means rare or exceptional. In fact, the large majority of rules from laws, regulations, contracts, agreements, service level commitments, MOUs, business policies, etc., follow the very same pattern. Here are two additional somewhat more involved examples[5].

> Behavioral Business Rule: *A student with a failing grade must not be included in a sports team.* What happens when a student already on a sports team (who presumably didn't have had any failing grade to begin with), now receives a failing grade in the current semester?

> Behavioral Business Rule: *A customer must be assigned to an agent if the customer has placed an order.* What happens when an agent currently assigned to a customer retires or leaves the company?

I call the events where a behavioral business rule can be violated *flash points*. Flash points are inevitable when you treat behavioral business rules as a first-class citizen.

Note that the various flash points for any given rule can occur in *different* process models, procedures, use cases, etc. – or at various points in random (unmodeled) business activity. Who or what is responsible for ensuring consistent results across all the flash points of each rule? Is it really any mystery why business processes often give such inconsistent results on things you'd think are basic? Or that data quality only seems to get worse and worse?

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[5] Reference: *Business Rule Concepts: Getting to the Point of Knowledge* (4th ed), by Ronald G. Ross 2013, p. 99-104.

Conclusion

In modeler-invoked evaluation of rules the burden of validating states of affairs for behavioral business rules is shouldered by modelers or coders. That's simply not smart. It's also a major factor in why business software remains so complex and brittle. The solution requires a paradigm shift – adding state-based evaluation as equal partner in rule platforms. For the record, it's not a question of one or the other – you need *both* for truly smart systems.

Author

Ron Ross

Ronald G. Ross is Co-Founder and Principal of Business Rule Solutions, LLC (www.BRSolutions.com). BRS provides workshops, consulting services, publications, and methodology supporting business analysis, business rules, business vocabulary, and rule management. His popular public seminars on business rules and business analysis, the first on business rules (starting in 1996) and the longest-running in the industry, are given through AttainingEdge (www.AttainingEdge.com).

At BRS, Mr. Ross co-develops Proteus®, its landmark business analysis and business rules methodology, which features numerous innovative techniques including the popular RuleSpeak® (available free through www.BRCommunity.com). These are the latest offerings in a 30-year career that has consistently featured creative, business-driven solutions.

Mr. Ross also serves as Executive Editor of www.BRCommunity.com and its flagship on-line publication, *Business Rules Journal*. He is a regular columnist for the *Journal's Commentary* section which also features John Zachman, Chris Date, Terry Halpin, and Roger Burlton. *BRCommunity.com*, hosted and sponsored by BRS, is a vertical community for professionals working with business rules and related areas. Mr. Ross was formerly Editor of the *Data Base Newsletter* from 1977 to 1998.

Mr. Ross is recognized internationally as the "father of business rules." He has served as Co-Chair of the annual Business Rules Forum Conference since 1997. He was a charter member of the Business Rules Group (BRG) in the 1980s, and an editor of

the two landmark BRG papers,"The Business Motivation Model: *Business Governance in a Volatile World"* (2000, revised 2005) and the "Business Rules Manifesto" (2003). He is also active in OMG standards development for business rules and business models.

Mr. Ross is the author of eight professional books. His newest are: *Business Rule Concepts* (2005), a second edition of his popular, easy-to-read 1998 handbook, and *Principles of the Business Rule Approach*, Addison-Wesley (2003), featuring the business rationale and opportunity for business rules. An earlier work, *The Business Rule Book* (1994, 1997), was the seminal work in the field.

Mr. Ross received his M.S. in information science from Illinois Institute of Technology, and his B.A. from Rice University.