Business Rules and Quality Standards

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The last few years have seen many E&P companies adopt methods and strategies that allow them to examine their data, measure its trustworthiness and completeness and then implement remedial actions. Several software vendors offer products that help companies implement these strategies. In addition, data and software vendors use a variety of data based rules to load data or integrate data from multiple sources for presentation to the user community.

The Business Rules Group (BRG) has worked with many industries world-wide to develop definitions, methodologies and best practices for the development and formulation of business rules (www.businessrulesgroup.org). The BRG has defined business rules from both the business and the IT side; in fact the group is very clear in their statements that business rules must be driven by business and harmonized by both groups.

Meaningful business rules exist for specific, articulated reasons, and are enforced in some way. Business rules that are enforced using technology components must be careful to develop enforcement mechanisms that do not alter these business rules (business rules are technology independent).

Several kinds of business rules exist. If we examine these rules, we will see that each is applicable to important facets of data management. Our premise is that the processes and definitions created by the BRG are applicable to data management, and will add value to the process of creating a standard set of data rules for our industry. In short, data rules are business rules, but not all business rules are (directly) about data.

1. Definitions of business terms. Without clarity about the terms we use and how they are defined, our progress in creating unified data management standards for our industry will have limited success. Core business terms such as “well” must be defined and adopted by industry. The PPDM Association “What is a Well” project is focused on this aspect of business rules.
2. Facts that relate terms to each other. We need to understand how the objects we deal with throughout the life cycle of asset management activities relate to each other. Many of these core relationships are contained in the PPDM 3.8 data model; this open standard model has been developed by industry experts and is the basis of many master data management strategies worldwide. Other expressions of business relationships must be defined and articulated.

3. Constraints and rules about what is permitted. These relationships refine rules about how data should behave. These rules are often expressed as data quality rules. For example, well logs should always be related to a wellbore.
4. Derivations. These rules define how the knowledge we have about one object may be used to calculate or infer other knowledge. These can exist as simply as rules that confine one kind of data value based on another data value (the deepest depth of a logged interval cannot be deeper than the deepest depth of the wellbore). At the highest level, they can be used to infer business intelligence.

Business rules generally consist of three parts, each of which helps to communicate the intent and function of the rule to an appropriate audience. We feel that using these components will add value to the creation of standard data quality rules:

1. The Policy. This is usually a general, enterprise-wide statement that helps to connect the business rule with business processes and the overall objectives for a business or an industry.
2. The Business Rule statement. This is usually a plain language statement of the business rule that is intended to be read by people. It should be understandable to business people, and should be atomic (can't be broken down). These statements are independent of people, processes and technology.
3. The Formal Rule statement. This captures the rule in a structured language that is useful for IT specialists and can be adapted to computer language. Semantics of Business Vocabulary and Business Rules (SBVR) is a good formal expression language (www.businessrulesgroup.org/sbvr.shtml). Pragmatically, these rule statements can be taken by any vendor and applied in their technology solution.

Following is an excerpt from the BRG website; these statements comprise the manifesto of the BRG. They are included in this paper explicitly as provided by the BRG (based on their licensing requirements) and were derived from www.businessrulesgroup.org/brmanifesto.htm. Each of these Articles is applicable to our industry as we develop a standard, common set of data based business rules.

Article 1.	***Primary Requirements, Not Secondary***
1.1.	Rules are a first-class citizen of the requirements world.
1.2.	Rules are essential for, and a discrete part of, business models and technology models.
Article 2.	***Separate From Processes, Not Contained In Them***

2.1. Rules are explicit constraints on behavior and/or provide support to behavior.

2.2. Rules are not process and not procedure. They should not be contained in either of these.

2.3. Rules apply *across* processes and procedures. There should be one cohesive body of rules, enforced consistently across all relevant areas of business activity.

Article 3. *Deliberate Knowledge, Not A By-Product*

3.1. Rules build on facts, and facts build on concepts as expressed by terms.

3.2. Terms express business concepts; facts make assertions about these concepts; rules constrain and support these facts.

3.3. Rules must be explicit. No rule is ever assumed about any concept or fact.

3.4. Rules are basic to what the business knows about itself -- that is, to basic business knowledge.

3.5. Rules need to be nurtured, protected, and managed.

Article 4. *Declarative, Not Procedural*

4.1. Rules should be expressed declaratively in natural-language sentences for the business audience.

4.2. If something cannot be expressed, then it is not a rule.

4.3. A set of statements is declarative only if the set has no implicit sequencing.

4.4. Any statements of rules that require constructs other than terms and facts imply assumptions about a system implementation.

4.5. A rule is distinct from any enforcement defined for it. A rule and its enforcement are separate concerns.

4.6. Rules should be defined independently of responsibility for the *who*, *where*, *when*, or *how* of their enforcement.

4.7. Exceptions to rules are expressed by other rules.

Article 5. *Well-Formed Expression, Not Ad Hoc*

5.1. Business rules should be expressed in such a way that they can be validated for correctness by business people.

5.2. Business rules should be expressed in such a way that they can be verified against each other for consistency.

5.3. Formal logics, such as predicate logic, are fundamental to well-formed expression of rules in business terms, as well as to the technologies that implement business rules.

Article 6. *Rule-Based Architecture, Not Indirect Implementation*

6.1. A business rules application is intentionally built to accommodate continuous change in business rules. The platform on which the application runs should support such continuous change.

6.2. Executing rules directly -- for example in a rules engine -- is a better implementation strategy than transcribing the rules into some procedural form.

6.3. A business rule system must always be able to explain the reasoning by which it arrives at conclusions or takes action.

6.4. Rules are based on truth values. How a rule's truth value is determined or maintained is hidden from users.

6.5. The relationship between events and rules is generally many-to-many.

Article 7. *Rule-Guided Processes, Not Exception-Based Programming*

7.1. Rules define the boundary between acceptable and unacceptable business activity.

7.2. Rules often require special or selective handling of detected violations. Such rule violation activity is activity like any other activity.

7.3. To ensure maximum consistency and reusability, the handling of unacceptable business activity should be separable from the handling of acceptable business activity.

Article 8. *For the Sake of the Business, Not Technology*

8.1. Rules are about business practice and guidance; therefore, rules are motivated by business goals and objectives and are shaped by various influences.

8.2. Rules always cost the business something.

8.3. The cost of rule enforcement must be balanced against business risks, and against business opportunities that might otherwise be lost.

8.4. 'More rules' is not better. Usually fewer 'good rules' is better.

8.5. An effective system can be based on a small number of rules. Additional, more discriminating rules can be subsequently added, so that over time the system becomes smarter.

Article 9. *Of, By, and For Business People, Not IT People*

9.1. Rules should arise from knowledgeable business people.

9.2. Business people should have tools available to help them formulate, validate, and manage rules.

9.3. Business people should have tools available to help them verify business rules against each other for consistency.

Article 10. *Managing Business Logic, Not Hardware/Software Platforms*

10.1. Business rules are a vital business asset.

10.2. In the long run, rules are more important to the business than hardware/software platforms.

10.3. Business rules should be organized and stored in such a way that they can be readily redeployed to new hardware/software platforms.

10.4. Rules, and the ability to change them effectively, are fundamental to improving business adaptability.

AUTHOR: The Business Rules Group
http://www.businessrulesgroup.org/brmanifesto.htm

Today, most of the rules that are used by software vendors are proprietary; often the rules used by various vendors are ambiguous, or thought to introduce errors into the resulting dataset. Our industry members would like to bring components of these rules into the hands of industry experts, and to encourage the adoption of a common, standard set of core rules.

Members of the PPDM Association are collaborating to develop a common set of data based rules that can be implemented through a vendor or internally. In addition, members are working to create a common set of quality definitions that will aid companies in communicating the level of completeness and trustworthiness of their data in a consistent and repeatable fashion.

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Trudy has nearly thirty years of experience in the Oil and Gas industry. Ms Curtis has worked internationally in technical and strategic projects to develop corporate knowledge and information management architectures and integrated technical environments. Trudy is currently serving as CIO and CEO for the PPDM Association. Trudy received a BSc. from the University of Calgary in 1978.

About PPDM
The Professional Petroleum Data Management Association (PPDM) is a not-for-profit organization that develops and maintains standards for the Resource Industry. With over 100 member companies comprised of petroleum businesses, government agencies, data vendors, software vendors and service firms, the Association provides a roundtable process to bring experts together to build useful, business-driven standards.