WHAT IS A BUSINESS RULE?

From the Business Rules Group:

Business Rules from the Business Perspective
• ...a business rule is guidance that there is an obligation concerning conduct, action, practice, or procedure within a particular activity or sphere.

Two important characteristics of a business rule are:
• There ought to be an explicit motivation for it.
• It should have an enforcement regime stating what the consequences would be if the rule were broken.

Business Rules from the Information System Perspective
• ...a business rule is a statement that defines or constrains some aspect of the business. It is intended to assert business structure, or to control or influence the behavior of the business.

http://www.businessrulesgroup.org/defnbrg.shtml
BUSINESS RULES & DATA RULES – CONNECTED?

If business rules are about processes …
And processes involve people and technology …
And those interactions result in KID …

Then business rules are about data!

But they are not ALL about data

*Data rules are business rules*

*but*

*not all business rules are about data*

The Business Rules Group provides an excellent framework for us to work in!
INTEGRATED ARCHITECTURE

MDM
Ontologies
Meta Data
Taxonomies
Physical
Spatial/GIS

Policies, Practices & Procedures

Business Rules

Acquire Land Rights (leases, concessions)

Well Planning

Facility Management

Drilling and Completion

Well Management

Incident Management

Reserves Calculation

Production Tracking

Decommission / Relinquish

Seismic Exploration

Tech studies (geochem, paleo)

Interpretation

Form Partnerships

Identify Opportunity

Copyright of Association 2010
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to the Business Rules Group, three kinds of rules exist:

Definitions and Semantics (BRG = Structural Assertions):
• What is an XXX (where XXX is a key business object or term)?
  - Many of these topics are the focus of existing or planned PPDM workgroups (i.e. “What is a Well”).
• What are the minimum data requirements for definition of a data object
  - (i.e. what is the minimum set of information required for a well)?

Transformation and Derivation Rules (BRG = Derivation):
• How should the data be converted from a 14 digit API to a 12 digit API?
• How should well information from financial, drilling, land, G&G be reconciled?
• How does the origin or source of the data affect its trustworthiness?
• How should I map data from one system into another?
• What about granularity challenges in my reference data?

Quality Rules (BRG = Action Assertions) … more on next slide
• Is this data correct?
• Can I trust this data?
• Is this data complete?

DATA QUALITY RULES

• Simple
  - no completion date on an abandoned location
  - Lat/long should be accompanied by a CRS

• Interpretive
  - [Completion Date > Spud Date > License Date]

• Regional
  - [Completion Date – Spud Date] < 180 days in the US
  - Total depth < 9,000' for xxx formation in Wattenberg field

• Spatial
  - Tops picks < 10% variation within 0.5 mile radius

• Validation
  - Has the data been verified procedurally?

• Trustworthiness
  - Does the data conform to a standard set of quality rules?

• Consistency
  - Is the data internally consistent?
E&P LIFE CYCLE (DATA IS BUSINESS DRIVEN)

1. Identify Opportunity
2. Form Partnerships
3. Acquire Land Rights (leases, concessions)
4. Well Planning
5. Drilling and Completion
6. Facility Management
7. Incident Management
8. Well Management
9. Reserves Calculation
10. Production Tracking
11. Decommission / Relinquish
12. Seismic Exploration
13. Tech studies (geochem, paleo)
WHERE DATA BASED BUSINESS RULES HIDE

• In your user’s software applications
• In ETL tools
• In your data cleansing tools
• Explicit or inferred in data models
• Written in procedures, functions, internal code
• Written in views, security grants
• Embedded and inferred in data content
• In Word, PowerPoint, Excel documents …
• In diagrams and workflow models
• In people’s brains
### Professional Petroleum Data Management Association
#### Business Rules Workshop: 2

<table>
<thead>
<tr>
<th>Rule Source and description</th>
<th>Available to your company? (Do you know what they are?)</th>
<th>Who creates / owns the rule? (Vendor, local organization)</th>
<th>Any conflicts with other known rules?</th>
<th>Retention strategy?</th>
<th>Subject to variation or change?</th>
<th>Available to Others? In what form?</th>
</tr>
</thead>
<tbody>
<tr>
<td>In your user's software applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In ETL tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Mapping spreadsheets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In your data cleansing tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explicit or inferred in data models</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written in procedures, functions, internal code</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written in views, security grants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embedded and inferred in data content</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Word, PowerPoint, Excel documents ...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In diagrams and workflow models</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In people's brains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PARTS OF A BUSINESS RULE (BRG)

Business rules are atomic
- They cannot be broken down into more detailed business rules

They consist of these parts
- The policy
  - general statement of direction for an enterprise
- The business rule statement
  - business rule in plain language
- The formal rule statement
  - expression of the rule in a formal grammar,
  - the definition of the grammar that is used (SQL, BRML)

Don’t forget that rules must be enforced.
- They are not just suggestions!
WHAT DATA RULES DO

Help us standardize how data is defined
- Common sets of terms and definitions that are based on the business, and that meet the needs of data managers, IT and business!

Govern how data is created and managed
- Well logs can’t be created until a well exists

Enforce important policies that should be supported
- Well logs must always be associated with the appropriate Wellbore

Support best practice recommendations
- The What is a Well component terms and definitions should be applied corporately

Allow us to verify data quality / trustworthiness
- The deepest depth of a logged interval cannot be deeper than the deepest depth of a Wellbore
- If data contains Latitude and Longitude, the CRS must also be populated
- A well’s spud date may not be before the drilling permit date.
PPDM & INDUSTRY PROPOSALS FOR BUSINESS RULES

Definitions of Business Terms

- What is a ???
  - What is a Well is underway
  - What is a Well Status is starting
  - What is a Facility is planned

- What are the minimum data requirements for definition of a data object?

Relationships and Constraints

- Industry standard data model (PPDM 3.8)

Best practice recommendations

- How should volumes be rolled up from a 14 digit API to a 12 digit API?

Data quality and trustworthiness

- Simple – no completion date on an abandoned location
- Interpretive – [Completion Date – Spud Date] < 180
- Regional – Total depth < 9,000’ for xxx formation in Wattenberg field
- Spatial – Tops picks < 10% variation within 0.5 mile radius
PPDM PROJECT:
RULES FOR DATA QUALITY AND TRUSTWORTHINESS

Definitions
• What is a data rule?
• What is a ???

Methodology and process
• How rules are collected and validated

Sample rule set
• Enough to be a good starting set

Web site
• Receive and validate new rules
• Publication to industry and members
• Searchable, retrievable

Communication strategy

Training and education materials

Maintenance and growth

BRG Structure
• Policy statement
  - Why the rule exists
• Narrative language, expressed in readable form.
  - Conditions of applicability (regional)
• Formal language expression
  - May be SBVR, based on PPDM 3.8 … (not decided)

This is a member funded project

Let us know if you would like to participate
WHERE TO END UP?

More global or regional rules
- But fewer overall, as we will consolidate and integrate!

Fewer individual or divisional rules

Implementation independent
- Everyone uses the same core set of rules
- Criteria for selecting a vendor

More standard rules
Fewer local rules
THE BUSINESS RULES MANIFESTO

AUTHOR: The Business Rules Group

http://www.businessrulesgroup.org/brmanifesto.htm

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.

Data rules are important; they must be **central**

to every data management strategy
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.

Data rules apply to the industry; they are not different for every company.

Data rules should not change when you move between software applications.

We need consistent, reliable data rules.
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.

Data rules need to be expressed, documented and shared.

Data rules connect business and IT.

Industry (we) must take ownership of our rules.
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.

Data rules are not transient, but they can change with the business.

Data rules are not vendor specific.

Data rules are not vague – they are very specific.
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.

Data rules require oversight by the business.

Data rules can’t contradict each other.

Everyone needs to apply data rules consistently.
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.

Data rules and applications should be independent.

Data rules can evolve as the business evolves.
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.

Data rules reflect a complex business.

How many of your rules are embedded in your ETL tool? Do you know what they are? Do your users know?

Global and regional variations may be inevitable, but these can be described and defined.
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.

Data rules are about the business!

As we create and consolidate rules, the overall number should go down, but they will be expressed better.
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.

Data rules are by the business, for the business, and about the business.

Data Managers must discover how to support the business in defining and describing rules.
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.

Data rules should be a measurable asset.

Data rules are hardware, software, vendor independent.

Data rules are practical and pragmatic, and evolve to suit the business.
Our Industry needs a standard, open set of business rules

The PPDM Association is working with industry to create these

• Some initiatives are underway now
• Others are planned

We welcome your participation and input!

• Our members drive and fund projects
• Many standards will be made publicly available