International Petroleum Data Standards
IPDS
Data Rules Program Strategy
2018

The Professional Petroleum Data Management (PPDM) Association
As the importance of analytics grows, data has come into its own. Industry realizes that data must be managed as a trusted corporate asset by trusted professionals. Working hand in hand, professionals, best practices and industry standards have never been more critical to industry than they are today. Professionally managed data makes us more efficient, lets us leverage data to find knowledge faster, and keeps our operations safer and more compliant.

Trudy Curtis, Chief Executive Officer

You can keep fixing your data…

…or fix it – forever!

Be part of the SOLUTION!
Research shows that data problems are a significant barrier to effective analytics in industry. Three of the key factors that impede how industry can trust and use data effectively are described in this paper. The Data Rules Project focuses on our need for data that is high quality and trusted. Below, we can see how the mechanisms for establishing trust have changed as data accessibility expands throughout industry.

Data Rules: Critical to Developing High Quality, Trusted Data!

Objective Criteria
(GLOBAL)

“This data has passed a rigorous set of specific tests to determine if it can be trusted.”

Agree collectively what to trust.

Discipline Knowledge
(DIVERSE)

“This method gives good results for rocks with a high maceral content.”

Domain expert based trust.

Subjective Opinion
(ME)

“I know Joe and trust his work. My data will work for ME.”

Many opinions about trust.

PPDM Rules Library:

An objective library developed by industry for industry

The PPDM Data Rules Library contains over 3,500 rules that describe how well-formed data should behave. Data rules allow you to objectively evaluate whether your data:

- **Is complete**: not missing critical information
- **Is conformant**: meets industry rules about what makes sense
- **Is compatible**: as a set the information represents what should happen in the real world

How much time and money could you save if you knew that incoming data met industry set expectations before it arrived?

Better data
Better decisions
The Professional Petroleum Data Management (PPDM) Association

The Benefits: Better Data, Better Data Management

Leverage global industry experts
Collectively the PPDM membership is able to develop and deploy data quality best practices faster and more reliably than any one company. Leverage work that has already been done.

Build Competency & Skill for DM professionals
The PPDM Rules Library organizes rules into high level concepts and principles that describe why “good” data should behave as it does. Rules can be about:

- Appropriate business behavior
- What is (or is not) physically possible
- What represents a legal, safety or efficiency risk
- Conformance to data governance policies or procedures

Concepts and Principles are embedded in training and education programs as foundational knowledge for data management professionals.

Verify data management competency
The PPDM Rules Library applies concepts and principles into specific cases. Skill verification procedures (exams) use these cases to verify that concepts and principles have been mastered.

Verify data quality and integrity
The PPDM Rules Library contains collections of atomic, testable, objective rules about data quality that can be set out as conditions for data that is received from other parties, data that is contained in tactical data stores (such as the data stores behind your software applications).

Embed auditable conditions for compliance to the Data Rules Library for each kind of data you send or receive with confidence that conformance to an objective standard is verifiable.

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**Concepts**

| Measured values have units of measure | Well construction events happen in proper sequence |

**Principles**

| Well depths must be in feet or meters | Wells are licensed before construction can begin |

**Data rules**

| The final MD of the well is in feet or meters | License date is before well spud date |

**Expressions**

| IF WELL.FINAL_DEPTH is NOT NULL, THEN WELL.FINAL_DEPTH_OUOM must be in (“FEET”, “METERS”) | WELL.LICENCE_DATE >= WELL.SPUD_DATE |
The PPDM Association
Data Rules Project

The PPDM Rules Library project is aimed at finding and fixing data problems as early in the life cycle as possible, and setting up mechanisms that prevent trusted, complete and appropriate data from attenuating as it moves among processes and stakeholders.

The PPDM Rules Library, launched a decade ago, is designed to help assess the quality, completeness and trustworthiness of data. The PPDM Rules Library already contains over 3,500 rules, thanks to the support of our members. To realize its full potential, industry must support the completion and organization of this library and encourage its adoption by all stakeholders through the life cycle.

Once embraced by industry, The PPDM Rules Library can be associated with both tactical and strategic data systems to ensure high quality data is maintained through end to end processes.

A complete, trusted and comprehensive rules library can become the data foundation in contracts, service agreements, data acquisitions, or divestitures as they reference and require adherence to an appropriate set of accessible, comprehensive, objective and testable rules from the PPDM Rules Library.

Understanding the PPDM Rules Library will be a key learning foundation for industry professionals, all of whom must understand the need for high quality data. Data rules are based on concepts and principles that become core knowledge for professional development of all industry staff, including (but not only) data management professionals.

Embedding the PPDM Rules Library into education, training and professional development systems will help a global network of data professionals who understand and can support data through the life cycle.

What PPDM Needs From You

1. **Donate your rules to PPDM**: Industry participation is in place already; other major operators have already agreed to contribute their data rules. Join in to help ensure that the library is comprehensive, validated and robust!
2. **Provide resources**: Consider making expert resources available for the development of useful and practical rule sets. Adequate industry resources will allow us to create these swiftly and effectively.
3. **Provide sponsorship**: Support project management, documentation, communication and publication resources to ensure that the program can start adding value soon. We ask every major operator participating in the project to donate $25,000.

Be part of the solution!
What are Data Rules?

**Data Rules**
Test conformance to the real world (what is possible).

- A data rule is a statement that provides the opportunity to validate compliance to expected conditions or to identify and review exceptions.
- Data Rules are intended to ensure that a program operates on accurate and useful data providing higher user confidence in the quality of the data.
- Data rules apply to data and information, not workflows and processes. They provide a method to define specific tests, validations or constraints associated with data items.
- Data rules are atomic; they each check one thing.
- A Data Rule always resolves to either true or false.

**Business Rules**
Combine rules and processes to develop best practices.

- A Business rule is a statement that defines or constrains some aspect of the business. They describe the operations, definitions and constraints that apply to an organization and are put in place to help the organization achieve its goals.
- Business rules can apply to workflow, policies, procedures, regulatory compliance, computing systems, individual behavior or corporate behavior.
- Business rules are often groups of data rules that describe how to assert business structure or control or influence the behavior of the business.
- A business rule contains one or more data rules, and data rules are contained in more than one business rule.

**Metadata Rules**
Test conformance to rules about how data is managed.

- A metadata rule is a statement that provides the opportunity to validate the information about a data record in terms of compliance to expected conditions or to identify and review exceptions.
- Metadata is “data about data”. Metadata rules apply to the database row (record). For example, row created date must not be null; published date is greater than created date.
- Metadata rules help ensure that data management processes retain the business integrity of the data.
- A metadata rule has the same purpose and design as a data rule, but is aimed at the data record rather than at the real-world object.
Data Management’s Purpose: Prevent Attenuation

What must data managers achieve?

Data Management professionals develop and steward an environment where data remains available and accessible to all stakeholders and processes through the long and complex E&P life cycle without being lost or corrupted.

Who does the data manager support?

The Data Manager’s objectives must both support and supersede the individual needs of each stakeholder group or process, to ensure that data is stewarded for the future and for others in support of the corporate goal of data management.

Why is does it take so much effort to get data ready?

Even though data is received in digital form, data consumers face delays before they can use it in scientific and analytic software applications.

Data needs to be checked, corrected, formatted and integrated before it is useable for your needs. And even when it’s finally available, users may not trust it.

The cause? Data Attenuation!!
Data should be correct, complete, trusted and available to all who need it, through the life cycle of each asset.

But often, it isn’t.

We obscure data content with proprietary formats, dialects, methods. Data development is siloed and disjointed; the results often only show part of the picture to each user.

We don’t agree what “good” data looks like. Each user group prepares the data to be fit for their specific purpose. As we change data, we don’t record provenance, so we are not sure what has been changed, or why. We re-verify data again & again.

We chop data up into pieces, and don’t connect the pieces. The pieces don’t fit with each other; each is a bit different!

Proprietary corporate projects try to solve these problems internally. Is that practical? If most of your data comes from outside sources that are not in your direct control, can you expect to prevent problems on your own?

You can keep fixing your data forever, or you can fix your data – forever!

The PPDM Association works with its members to create standards & best practices as the foundation of a trusted and useful discipline.

Set agreed principles that describe what “good” data looks like, embed in standards and best practices.

Set agreed, measurable criteria that measure data’s conformance to expectations.

Teach data managers. Verify conformance of products and services.

The PPDM Rules Library enables systems to build data that is trusted and ready for action.

PPDM projects allow industry to collectively resolve data problems – forever!
PPDM industry developed products prevent data attenuation by enabling consistency, clarity, completeness & transparency.

This paper is focused on the **PPDM Rules Library**.
Communities who work together ...

... to create a Body of Knowledge ...

... that is used to support a trusted and useful discipline ...

... that benefits Industry.

The PPDM Association is a purposeful, intentional community of data management professionals. We aim to make data better!

International Petroleum Data Standards (IPDS) are the outcome of collective action by industry professionals; they are created by industry for industry.

Trust is built on transparency and consistency of practice. Usefulness is based on verifiable knowledge and skill of data management professionals.

Benefits are realized when trusted data and information can be reliably and swiftly accessed for analytics and decision making.

Data management professionals contribute to society and industry by providing reliable, safe, competitive, environmentally friendly and ever improving energy solutions through their profession.
Why PPDM?

Leverage your data
Analytics run at the speed of your data. In the hands of a professional data manager, PPDM standards let you leverage your data faster.

Gain efficiency
Search for oil instead of data. PPDM Standards help keep your data accessible for decision making. Professionals get the job done efficiently.

Drive excellence
PPDM Standards build the foundation. Data professionals take care of the data. Combined, they let you see what others cannot see, discover what is possible.

Build trust
Data professionals manage data so it’s available when you need it for decision making or emergency management.

Deploy technology
Wielded by data professionals, built on best practices and standards, your data is part of today’s digital transformation. Leverage advanced analytics, machine learning, artificial intelligence, the Industrial Internet of Things and automation.

Inspire peers
Industry leaders help you discover ways to improve your skills and find technologies to help you stay ahead of the competition.

Lead colleagues
Be the difference, be part of the data revolution!

Learn new skills
Discover emerging frontiers, learn how innovation keeps you competitive.