VERSION .1

MAY 7, 2018

This is a DRAFT document and has not been approved by the PPDM Board of Directors.

It is provided for information purposes to interested stakeholders.

RULES PUBLICATION PROPOSAL

DRAFT CHARTER/TERMS OF REFERENCE

PRESENTED BY: THE PPDM ASSOCIATION

PROFESSIONAL PETROLEUM DATA MANAGEMENT
ASSOCIATION
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CONTENTS

Why PPDM?

A recognized professional discipline is created by a governed body of ethics-driven professionals who have an intentional and common purpose to develop, deploy and support a body of knowledge and professional development for the practice of data management as a professional discipline.

Helping industry discover and use relevant standards and best practices is a critical part of this program. These make industry more efficient through access to consistent and trusted data, and promote the emergence of a portable, skilled and prepared work force of professional data managers.

We hope you will support this PPDM project, which will both support high quality trusted data that enables strong processes, analytics and decision making to all of industry and provides a foundation for training and certifying data professionals who support key data processes.

Rules Publication Proposal

EXECUTIVE SUMMARY

Powerful and practical analytics and decision support software products abound in industry. Taking advantage of them depends on access to trusted, accessible and appropriate data. However, in most companies, this is difficult and time consuming. Executive frustration is growing as data continues to be the main barrier to taking advantage of technology.

__Instead of forever fixing data, we should focus on fixing our data – forever!__

Every company or organization in our industry is stuck with the same problem. Virtually every bit of data received must be reviewed and prepared for use in the many workflows and processes in the oil and gas industry. Whether or not they have a formal designation, data managers spend vast amounts of time and money working with data that usually arrives in digital (likely either not immediately usable or trusted) form.
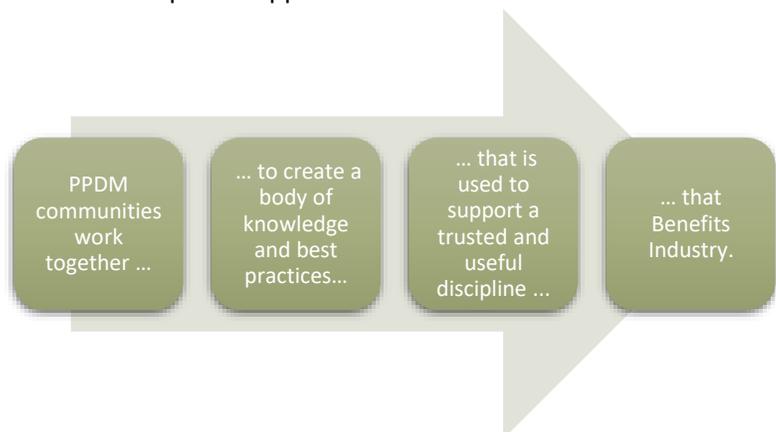
This is inefficient, wasteful and can present nearly intractable problems. Resolving these problems requires us to work cooperatively with each other, so that foundational variations in format, structure and dialect can be resolved.

The PPDM Association believes that the time has come to work together to resolve this problem for everyone. This proposal recommends the creation of a central library of data rules that can be accessed by all stakeholders at all stages of the life cycle of an asset to objectively test whether or not it "passes muster".

You are invited to participate in this project, help us treat data as a strategic business asset using measurable and specific criteria. Successful completion of this project and deployment in suitable technology will result in substantial savings to industry, significantly more trusted and appropriate data, and access to technology tools for analytics and decision support.

The Professional Petroleum Data Management (PPDM) Association is the global, not-for-profit society within the petroleum industry that provides leadership for the professionalization of petroleum data management through the development and dissemination of best practices and standards, education programs, certification programs and professional development opportunities.

PPDM represents and supports the needs of operating companies, regulators, software vendors, data vendors, consulting companies and data management professionals around the globe. Through the PPDM Association, petroleum data experts gather together worldwide in a collaborative, round table approach to engineer business driven, pragmatic data management standards that meet industry needs.

PPDM communities work together … … to create a body of knowledge and best practices… … that is used to support a trusted and useful discipline … … that Benefits Industry.

PROJECT BACKGROUND

Technology has made today's analytics and decision-making tools appealing, affordable and beneficial. Nevertheless, many companies struggle to achieve the benefits that these tools promise. Studies at global and industry levels all tell the same story – our ability to leverage technology depends on access to high quality, consistent, trusted data. Without a strong data foundation, analytics tools may give results that are misleading or simply wrong.

Expenditures in technology development have outstripped data development for decades, with data commonly treated as a tactical appendage of software design. The result is that even large companies continue to struggle with data systems that are siloed or locked into proprietary software data stores. Even though data that input into technical systems is received in digital form, considerable effort must be expended to prepare and structure data into a form suitable for each individual data store. Through the life cycle, the same set of data is received (digitally), reviewed, quality controlled and formatted for load into system after system.

This redundant work wastes time, diverts talented resources from more important functions, delays critical decision making and increases the time and cost of finding and producing hydrocarbons. Today's economy does not allow these inefficiencies to continue. Data professionals, scientists and decision makers should be able to focus on productive work, rather than reworking the same data again and again.

Virtually all the data that passes through the hands of each industry stakeholder is structured and developed according to the specifications of another party. Data comes from your field service company, data vendor, regulator, or vendor software; each data source conforms to the specifications of the organization who created or last controlled the data.

Data management strategies of even the largest companies cannot alter the resulting consequences. Data managers spend vast amounts of time finding, structuring, verifying, preparing and loading data for use in system after system – always conforming the data to the specifications of each process or system. Clear benefits can be obtained if we can solve the foundational problems that result in these differences between systems.

PROJECT PURPOSE

The project is aimed at 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. PPDM will work with members to develop a comprehensive set of specific, industry agreed rules against which data can be objectively tested at each stage gate. Once in place, this will provide the framework for contractual expectations about data between stakeholders, and within the many tactical and technical systems used by industry.

Embedding these expectations 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. PPDM has relationships with several schools now and will work with other parties as feasible to ensure that this common framework becomes the foundation of excellence in data management.

INITIATIVES IN THIS PROPOSAL

In collaboration with its members, the Professional Petroleum Data Management Association has identified several key areas that will benefit from a common foundation of data standards and best practices. This proposal focuses on two of these:

1. **A Common Foundation for Trust**: Trusted data grounds analysis, interpretation and decision making. Unfortunately, trust is degraded as data is moved between stakeholders, processes and systems, mainly because of the physical and contextual data attenuation that occurs in tactical, process-centric systems.

   Data attenuation, and the loss of trust that comes with it, can be resolved if industry creates and deploys a set of agreed conditions that define "good" data. These conditions can be developed as objective tests that assess data as it flows among industry systems through the life cycle. This proposal recommends a mechanism to develop and deploy a comprehensive and open system of data rules that is created by industry for the benefit of all stakeholders.

   Once complete, we will have developed industry accepted rule collections that are appropriate to business functions.

   - Content: The content of the PPDM Rules library will be expanded to cover the topics more important to industry today. We expect the rules library to grow from about 3,500 to over 10,000 rules.
   - Collections: Key subject areas will be selected by sponsors – we will work with industry experts to ensure that the rules collection in each subject can be used to designate data as trusted, complete and fit for purpose. Over the course of a year, we hope to cover at least 5 – 10 subjects, provided we have sufficient industry participation to make swift progress.

   The PPDM Rules Library, developed several years ago, is designed to help assess the quality, completeness and trustworthiness of data. To realize its potential, industry must support the completion and organization of this library and encourage its adoption by all stakeholders through the life cycle. Once complete, these rules 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 foundation to build contracts, service agreements, data acquisitions, or divestitures when they reference and require adherence to an accessible, comprehensive, objective and testable rules library.

2. **Professional Development**: Understanding these rules will quickly become a keystone for the development of industry professionals, all of whom must understand the need for high quality data. Data rules are based on concepts and principles that become the foundation for professional development of all industry staff, including (but not only) data management professionals.

   The PPDM professional development program strives to help industry understand what good data looks like, the kinds of data problems that may happen, and the consequences to the business when bad data reflects an error in a business process, or an error in data systems. It further helps set out courses of action for various kinds of data problem. More information can be found in the appendix.

   Upon project launch, we will work with schools and other professional development programs to help them embed the rules as appropriate. PPDM will also embed the rules into its existing data management training classes and work with members to encourage the development of a wide array of materials that encompass the concepts within the rules library.

The PPDM Association develops data management training classes and is working with educational and training organizations to encourage the creation of strong and consistent framework for data management professionals. This, in turn, will help a global supply of well-trained data professionals who have a strong understanding of the requirements and principles of data in the oil and gas industry. A prepared and portable professional resource pool helps industry launch and deploy new projects quickly.

PROJECT PROPOSAL SUMMARY

The PPDM Association has been working with industry towards the creation of an open, industry standard family of data rules. **While the organic growth of the rules library is moving forward, progress is not meeting the needs of industry in a timely way.** Achieving the benefits outlined above requires swift and decisive action. Your help is critical to setting the necessary systems in place.

WHAT WE ARE ASKING FOR

Virtually every major oil and gas operator has developed an internal family of rules that are used to test whether data is correct, complete, conforms to expectations, and appropriate for its purpose.

1. **Donate your rules to PPDM**: We ask that you donate your data rules to the PPDM Association, so they can be integrated with other sets and organized into useful collections for deployment in data assessment. These collections will mainly conform to data types (such as directional surveys, well logs, seismic headers etc.) and key processes (acquisition, interpretation etc.).
2. **Provide resources**: We ask that you consider making expert resources available for the development and approval of these rule sets. Adequate industry resources will allow us to create these swiftly and effectively. We believe that with adequate resources, each collection can be prepared for review in only a few weeks of elapsed time (a few days from each SME). Without adequate resources, this program will lag behind schedule – an outcome not aligned with industry needs and expectations.
3. **Provide funding**: Funding to support necessary project management, documentation, communication and publication resources is needed to ensure that the program can be completed quickly, and start adding value to contributors and industry soon. We ask every major operator participating in the project to donate $25,000; with at least 5-6 participants we should have sufficient funds to run the project for about a year, and provide a useful frame of reference for the next steps.

WHAT WE WILL DO WITH THE RULES THAT YOU DONATE

As we collect rules created by key operators and other stakeholders, we will be able to develop a comprehensive resource that will benefit all stakeholders. With this PPDM will:

1. **Collect**: Assemble and organize industry contributions into logical collections, often by "data type" such as digital well logs or seismic navigation.
2. **Review**: Form agile work groups consisting of subject matter experts to assess, condition, compile and approve a final rule collection for each logical set. Each logical rule collection will be supported by an appropriate group of industry-provided SME.
3. **Prepare**: Final rule sets will be classified, organized and otherwise prepared for publication in the rules library.
4. **Publish**: Publish the rules in the growing open rules library, which exists today and contains over 3,000 rules. You can access the library at rules.PPDM.org. PPDM intends to make the rules library an open industry resource.

5. **Deploy**: Review and make recommendations about technologies that may be able to deploy the rule sets in a business setting. Currently, blockchain technology is of interest to many members.

HOW WE WILL SUPPORT DATA PROFESSIONALS

Industry safety awareness programs have resulted in substantial HSE and productivity improvements throughout industry. Similarly, training or education programs about what makes data "good", and the role that everyone has in developing and supporting the data asset will strengthen programs for data preparedness.

1. **Professional Development**: The concepts and principles that underly data rules will be made available to education or training programs. These will support the emergence of a strong baseline of competency and knowledge for data professionals – indeed, all industry professionals!
2. **Competency and Capability**: Mechanisms for evaluating the knowledge and skills of data professionals can be assessed through specific cases taught as concepts or principles.

SCOPE

This project will focus first on the most critical rule collections that are needed to achieve the main goals. The priority order will be established by industry sponsors. Additional collections may be recommended once this is complete.

IN SCOPE

- Data rule sets in human readable English form.
- Machine readable forms (such as SQL statements) may be developed if sponsor companies wish to do so, and sufficient funding and resources are available.
- A mechanism for evaluating a system, process or data store for compliance to the rules will be discussed. Recommendations for developing such a mechanism may be developed at the discretion of the participants.

OUT OF SCOPE

- Work flows and specific business processes are out of scope, as these are typically proprietary
- Training support materials and classes will be developed as a separate initiative and will not be funded by this project.
- Technology specific deployments will typically be completed by interested companies.

DELIVERABLES

KEY DELIVERABLES	PRIORITY / ORDER	SPECIFIC RECOMMENDATIONS
Data rules library		The data rules library will be published at rules.PPDM.org. Ultimately, the library will be publicly available, but access may be restricted to sponsor companies for an initial review and evaluation period.

Classification system		The rules classification system, already partly in place, will be expanded as needed to make rules discoverable and retrievable.
Recommendation for compliance		The working group will evaluate options for a compliance mechanism and make a recommendation for additional development
Rules Hierarchy		For professional development purposes, the rules will be organized by concepts and principles, and become part of the knowledge library at the PPDM Association.
Machine readable rules (SQL etc)		This will be developed if the sponsors wish it and provide sufficient funding and resources to accomplish the work.

FUNDING MECHANISMS

Project Launch: The committee will be launched with sufficient industry funding as per the preliminary budget contained within this document.

Project Sustainment: A business plan will be developed outlining methods for the necessary ongoing funds to be acquired. We note that this may include advertising or corporate sponsorship; the advantages and disadvantages of these approaches must be considered and approved.

ASSUMPTIONS

1. **Committed, paid resources position projects for success**: PPDM staff will support logistical and organizational requirements, will ensure that the committee is well formed and adheres to appropriate Policies (including Code of Ethics and applicable Anti-trust law)

2. **Industry participation is essential for success**: Work will be done by a combination of paid and volunteer resources, coordinated by the PPDM Association. Volunteer participants will be available to serve a one-year term, renewable if mutually desired.

3. **IP contribution rights protect industry**: The necessary IP contribution rights will be supported, as it is recognized that contributors may not all be PPDM members. This may be partly addressed through appropriate licensing arrangements (such as the Public GNU).

   o   Grant of right given by contributors

   o   Grant of right to use given to users of the website.

4. **Existing materials can be leveraged**: It is expected that companies and organizations will donate existing work to the program.

5. **Industry support will build through early success**: Identifying and developing appropriate avenues to support the ongoing development and maintenance of this site is critical to long term success.

6. **Legal obligations must be fulfilled**: PPDM Policies and guidelines must be followed by all participants, although membership will not be required for participation.

RISKS & CONSTRAINTS

1. **Vendor Neutrality Policy**: Neutral optics are essential to success and is a PPDM requirement; the team may restrict funding options that suggest undue corporate influence, and thus reduce options for obtaining industry sponsorship of the site. This needs to be addressed early in the project.
2. **Delays may impact delivery**: Economic conditions may result in some program delivery delays, both for funding and resource gaps. Committed funding for the first year is a pre-requisite to launching this project.
3. **Long-term planning is essential**: We recognize that making the information complete and filling content gaps will take time and require trust building to encourage participation. Industry patience as the first phases are built out is needed, so expectations management is critical.
4. **Trusted content builds momentum**: Editorial and content governance will be essential to ensure that content is appropriately oriented. Mechanisms for receiving and integrating industry contributions are needed, although it is recognized that a ramp-up time may be needed before companies feel prepared to share information and ideas.

BUDGET HIGHLIGHTS

PPDM project budgets do not include infrastructure costs, such as office space, communications etc.

Requirement	Resource	Cost (year 1)
Logistics and program management support	PPDM staff members	$ 50,000
Content management	PPDM staff to coordinate writers and working groups	$ 50,000
Web development	PPDM staff web developer	$ 15,000
Communication	PPDM staff and committee members	$ 10,000
Web hosting	Third party	$ 2,000
Legal	Third party	$ 10,000
TOTAL		$137,000

ROLES AND RESPONSIBLITIES

Role	Who	Functions
Management and logistics	PPDM staff	- Project management - Infrastructure - Scheduling and delivery - Financial controls - Legal and Audit obligations
Rules Committee	PPDM staff, industry volunteers	- Content guidelines - Content oversight - Website Graphic User Interface (GUI) design
Rule developers	PPDM staff, industry volunteers	- Rules and related content preparation
Contributors	Industry stakeholders	- Source material donation - Graphics or illustrations - Seconded staff resources
Webmaster	PPDM staff	- Website development - Website functionality - Security and access management

IMPLEMENTATION APPROACH

This project will be managed with an iterative and incremental method to review the opportunities that are most valuable to industry. This will be highly interactive and require participation from input from both operator and vendor subject matter experts.

HIGH LEVEL TIMELINE/ SCHEDULE

- Contingent on the scope of the charter, this committee is projected to launch in 2018.
- This work is expected to span many years, with the first part of the work completed within 1 year, depending on the number of standards to be included.
- Delivery speed is essential, with rule families being published for review every few weeks, once the initial rule set has been compiled and prepared.

RELATED PPDM INITIATIVES

Although all PPDM projects are inter-related, these projects are not included in the scope of this project proposal. They are provided to illustrate the comprehensive approach that the PPDM Association has undertaken to resolve data related challenges for the oil and gas industry.

1. **Common Vocabularies:** As industry has evolved, independent vocabularies have emerged. Unfortunately, while technology advanced, our vocabularies often failed to keep pace with change. Many of our vocabularies are out of date or have devolved into local corporate or regional dialects.

   The PPDM Association is developing tools, such as What Is A Well, Well Status and Classification, and What is a Completion, to help resolve this problem.   This proposal will be completed in conjunction with ongoing projects in this area, and work by affiliated standards organizations.

2. **Business-Oriented Data Stores**: Data attenuation often results when data is loaded into a technical or tactical piece of software. As data is passed from tactical system to tactical system, data attenuation swiftly becomes irreversible. Effective data management processes manage data in a business-oriented data store, and pass data to tactical systems as needed. This allows the business-oriented master to steward critical data for reuse or integration into other systems. Industry standards such as the PPDM Data Model are designed to support this need.

   Managing data strategically using an industry standard such as the PPDM Data Model helps ensure that data is stored in the context of the business, rather than a software solution. This proposal recommends that data rules should be associated with key business data objects through their life cycle, and continually used to assess the quality and effectiveness of strategic and tactical systems.

3. **Professional Development**: Data professionals benefit from objective clarity about what makes data "good", and what the consequences of data failure or attenuation are. Understanding the consequence to the business, appropriate remedial courses of action, and suitable resolutions is the foundation of effective data management.

   High quality professional development programs, coupled with appropriate evaluation mechanisms (such as the CPDA certification) help our industry develop a workforce that is portable, global and ready to work. The PPDM Association, in alignment with partner organizations, is working toward establishing this workforce.
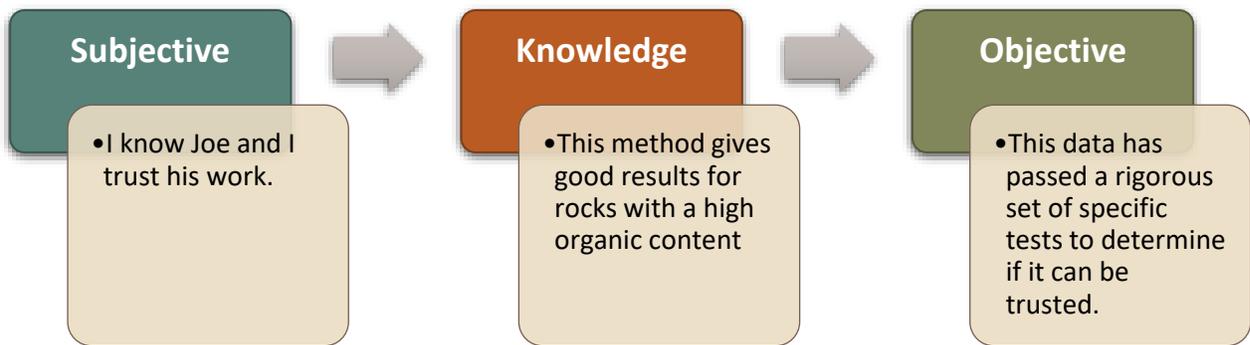
APPENDIX: MORE ABOUT DATA RULES

1. THE BASIS OF TRUST

Essentially, industry relies on a set of technical experiments (seismic, logs, chemistry) for the foundational information upon which interpretations are made. These interpretations become the basis for decision making and analytics.
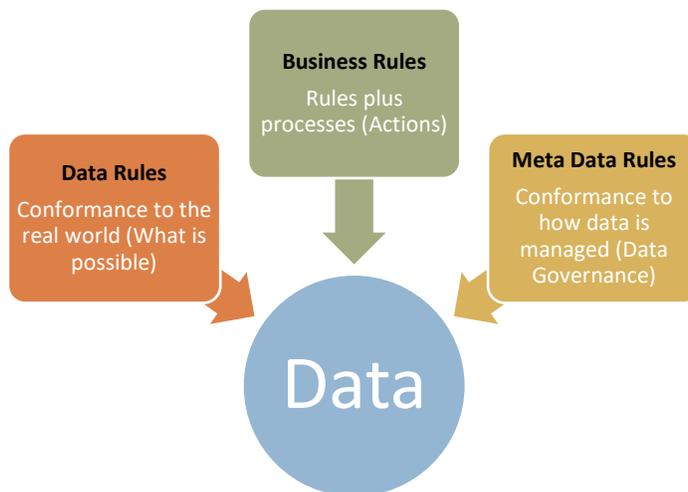
Historically, trust has been based on local knowledge about who created data and how it was made. Scientists are trained to understand how effective different kinds of experiments are in evaluating the properties of rocks and other materials.

As industry globalizes, and discipline based siloes are erased, this knowledge must be encapsulated in increasingly specific, measurable and objective criteria.

Subjective	Knowledge	Objective
•I know Joe and I trust his work.	•This method gives good results for rocks with a high organic content	•This data has passed a rigorous set of specific tests to determine if it can be trusted.

2. INTRODUCTION TO RULES

Here are some simple definitions upon which the PPDM Rules Library is based:

Business Rules
Rules plus processes (Actions)

Data Rules
Conformance to the real world (What is possible)

Meta Data Rules
Conformance to how data is managed (Data Governance)
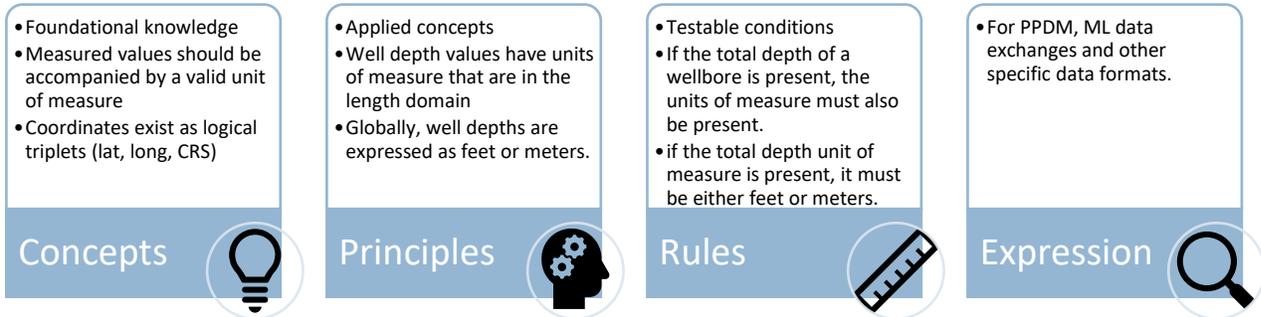
Data

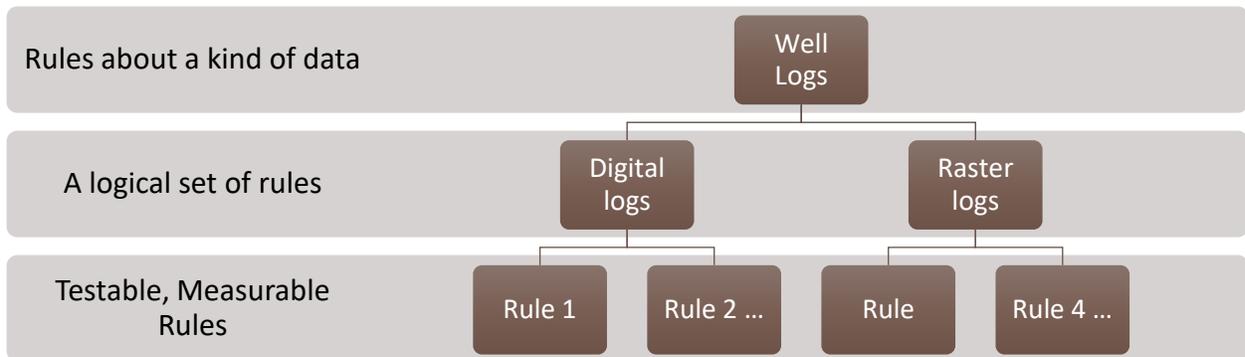| Data Rules	A data rule is a statement that provides the opportunity to validate compliance to expected conditions or to identify and review exceptions.
	Data rules are atomic; they each check one thing.
	A Data Rule always resolves to either true or false.
	Data Rules are intended to ensure that a 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.
Business Rules	A Business rule is a statement that defines or constrains some aspect of the business. Business rules 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 in an organization.
	Conformance to a business rule must be measured by determining whether the necessary processes have been applied to data and information.
	Business rules is a grouping of data rules by describing how to assert business structure or control or influence the behavior of the business.
	A business rule will contain one or more data rules, and data rules will be contained in more than one business rule.
Meta Data Rules	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.
	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.
	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.

3. RULE DIMENSIONS

Rules can be arranged into logical sets that progress from general concepts that describe an expected data governance condition to specific, testable scripts and procedures.

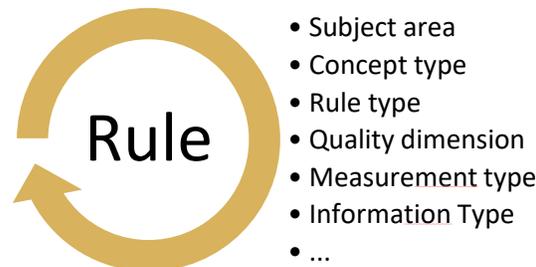|			
• Foundational knowledge • Measured values should be accompanied by a valid unit of measure • Coordinates exist as logical triplets (lat, long, CRS)	• Applied concepts • Well depth values have units of measure that are in the length domain • Globally, well depths are expressed as feet or meters.	• Testable conditions • If the total depth of a wellbore is present, the units of measure must also be present. • if the total depth unit of measure is present, it must be either feet or meters.	• For PPDM, ML data exchanges and other specific data formats.
Concepts	**Principles**	**Rules**	**Expression**

4. CREATING COLLECTIONS OF RULES

The PPDM Association Rules Publication project will group wells into logical collections, often based on data types.

Rules about a kind of data	Well Logs
A logical set of rules	Digital logs Raster logs
Testable, Measurable Rules	Rule 1 Rule 2 … Rule Rule 4 …

5. RULES CLASSIFICATION

Rules will be classified using the concepts of faceted taxonomies. This will help users search the library and find the rule collections most useful to them.

Rule

• Subject area
• Concept type
• Rule type
• Quality dimension
• Measurement type
• Information Type
• …

6. DATA RULES AND PROFESSIONAL DEVELOPMENT

The rules library is the key mechanism for collectively defining what "good" looks like, and for developing the knowledge base on which the professional discipline is grounded.

Concepts: Used to set learning objectives and core competencies

Principles: The basis for teaching and learning how data behaves

Data rules: Test whether principles have been mastered

Expression: Test detailed technical knowledge for using rules