Collaboration with the OSDU Forum

... that benefits Industry through data that is accessible, trusted, and ready to use.

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

... to create International Petroleum Data Standards (IPDS)...

Communities work together...

The Professional Petroleum Data Management Association

PPDM is the not for profit, global society that enables the development of professional data managers, engages them in community, and endorses a collective body of knowledge for data management across the oil and gas industry.

www.PPDM.org

9/15/2020
Disclaimer

This paper was prepared by the PPDM Association and has not been formally endorsed by the OSDU Forum.

This paper was written to explain the work of the PPDM Association and how the work done by PPDM Members can potentially support the development of the OSDU Platform.

In each section you will find a brief statement explaining how that product family is recognized in the OSDU Forum agreement (2020). As time goes on, we expect this status information to progress.

Please contact the PPDM Association for updates.
The PPDM Association - OSDU Forum Collaboration

Executive Summary

For thirty years, the mandate of the PPDM Association™ has been the development of the data management professionals, along with the standards and best practices that ensure petroleum data continues to evolve as a trusted and relevant asset both for its members and industry as a whole.

The global reach of the PPDM Association covers 133 countries, and includes a network that exceeds 16,000 individuals. The PPDM Association’s reach is substantial.

✓ **Community building** through physical and virtual events, publications and volunteer engagement.
✓ **Certification** for Petroleum Data Analysts (CPDA™).
✓ **Training** programs for classroom and online delivery.
✓ Semantic standards such as “What is a Well” and “What is a Completion” continue to help industry communicate clearly about critical best practices.
✓ Standard vocabularies such as “Well Status and Classification” provide contact points for process and systems integration.
✓ The PPDM Association **Rules Library** ensures that industry has a baseline expectation for data quality and trust.
✓ The vast storehouse of knowledge behind the **PPDM Association Data Model** remains relevant and is being translated into open data object definitions that will continue to be essential as technology progresses.

The **Open Group Open Subsurface Data Universe™ (OSDU)** data platform will revolutionize industry’s ability to deliver new subsurface capabilities through the creation of an open, standards-based ecosystem that drives innovation and accelerates the deployment of emerging digital solutions for better decision making. Industry participation in The Open Group OSDU™ Forum and support for the OSDU project is unprecedented.

The PPDM Association uses industry-driven, effective and efficient processes to develop and deliver products and services that have provided a trusted and integral foundation for data management in the petroleum industry since 1990. PPDM Association members, many of whom are also engaged in the OSDU Forum, are determined to see the value of their contributed industry expertise leveraged for the benefit of the OSDU Project.

The **OSDU Forum** will develop API’s and technology standards to support its objective. The **OSDU Forum** also has a stated intention to deploy new and existing best in class industry standards, rather than develop them. The OSDU Forum has openly recognized the tremendous value that PPDM Association standards and best practices bring to the creation of an open architecture that will support multidisciplinary subsurface collaboration in a platform fully integrated at the data level.

The OSDU Forum intends to fully leverage PPDM Association value and is actively encouraging ongoing work to develop additional standards and best practices. PPDM Association members are continuing to develop these to serve as a backbone for interoperability. Many of the key organizations driving the OSDU Forum continue to participate in PPDM Association Projects, recognizing that both must move forward for continued success.
About The PPDM Association

The Data Ecosystem

Data ecosystems can be complex. Technical systems, each with its own data stores, formats, procedures and logic must attempt to interact successfully, even when fundamental differences in structure, content and vocabulary make this difficult.

The OSDU Data Platform intends to resolve some of these barriers by implementing a common technical data container structure, based on JSON, and developing a standard technological framework. The resulting environment will enable stakeholders to function within an open, competitive marketplace of products and services.

Successful adoption of this environment will also depend on how well other elements of the data ecosystem converge. The PPDM Association is dedicated to working with industry and the OSDU Forum to ensure that this emerges for the mutual benefit of all stakeholders.

Data Ecosystem

Data Contents
Data is at the center of the ecosystem. Our industry’s processes and technology are focused on using it. Ensuring that the data is convergent in content, quality and completeness is essential. PPDM Association reference lists and semantic disambiguations are an essential component of an interoperable data ecosystem.

Object Contents and Definitions
Clear definitions of how a well-formed data object should be structured, including what it should contain and how it must behave to support interoperability without data attenuation. Details about how the PPDM Association is developing data object definitions are provided in other documents.

Container Structure
Traditionally, data object definitions have been structured according to the technical requirements of a technology specific container. The PPDM Association’s flagship standard is embedded in a relational database container. The knowledge embedded in these containers is extracted by members.

Communication Protocols
Data transfers introduce high risk that data will be attenuated. PPDM Association members work to ensure that this risk is mitigated though transparent rules that can be applied at the source and target to ensure that data integrity is maintained.

Competency and Capability
People provide the connections between technology and processes. Well trained, certified data professionals ensure that each element of the data ecosystem is well maintained and managed.
About The PPDM Association

Build the Body of Knowledge

PPDM Association IPDS (International Petroleum Data Standards and Best Practices) programs are focused on solving key data requirements that support improvements to operating efficiency and productivity, clear communication, better regulatory relations, technology adoption and digitalization. PPDM IPDS products support the core of a recognized professional discipline. The professional discipline is predicated on the existence and consistent use of these materials as appropriate.

IPDS: International Petroleum Data Standards and Best Practices

PPDM Association Subject Matter Experts (SME) in the community of practice identify or create a family of best practices and standards that support and sustain a reliable foundation of practice. Consistent, professionally conducted data practices support the need for data and information as portable, long-lived strategic assets in the petroleum industry.

✓ **Best practices**: This is foundational knowledge for a data manager in the practice of their profession. “What is a Well”, “What is a Completion”, “Well Status and Classification” and the “Business Rules Library” are good examples of foundational knowledge elements.

✓ **Standard Specifications**: Technical specifications, usually defined formats for data containers, are used by data managers to ensure that data is interoperable, accessible and available to all stakeholders. The PPDM Data Model is an example of a Standard Specification.

The PPDM Association has defined six critical IPDS Zones that are critical to the development of trusted data systems. First, and most critical, is the development of certified data professionals. The remaining five IPDS Zones are the focus of PPDM Association technical work groups and committees. These are described elsewhere in this document.

Data Professionals have an objective to create an environment where trusted data remains available and accessible to all stakeholders through the E&P life cycle without being lost or corrupted.

The Data Manager’s objectives must both support and supersede the individual needs of each stakeholder group or process, to ensure that trusted and appropriate data is stewarded for all stakeholders in the support of corporate and industry goals.
OSDU Will Leverage PPDM to Support Professionals

Competence & Capability

Trained, certified professionals provide the backbone of data services to support thousands of critical business processes.

The PPDM Association’s professional development programs provide a critical foundation for our global data professionals and are supported by three key member committees.

- The PPDM Certification Committee (PDMCC) manages the Certification Exam bank and administers the CPDA™ credential program.
- The PPDM Education Committee (PEAC) is tasked with supporting the emergence of learning programs.
- The PPDM Professional Development Committee (PDC) develops job descriptions, compensation frameworks and other reference materials that support our data disciplines.

A successful OSDU strategy will leverage the knowledge and skill verification already embedded in the PPDM Association’s Certified Petroleum Data Analyst (CPDA™) credential.

PPDM in OSDU STATUS: Under Discussion

The PPDM Association believes that successful implementation and adoption of the OSDU framework will depend on the skills and knowledge of the data professionals who are responsible for the contents in the OSDU framework. The PPDM Association proposes a solution to ensure that these and future programs are positioned to meet the needs of those who work in the OSDU environment.

The PPDM Association has proposed OSDU professional development materials be harmonized with existing materials in place at the PPDM Association to support the emergence of OSDU centric roles.

Proposal Summary

1. **Competency and Capability Framework** required for users of the Platform. The framework will be harmonized with the current PPDM Competency Framework for data professionals.

2. **Standardized learning objectives** for Accredited OSDU training programs. These will be maintained for the Open Group to be used as part of the training accreditation process.

3. **Online learning programs** for business and technical users of the Platform. Two accredited learning programs are planned.

4. **Exam banks** for certifications administered by the Open Group. Two new certifications are currently planned. The program will leverage existing PPDM CPDA™ certification.

Competency framework

<table>
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<th>Competency</th>
<th>Prioritization</th>
<th>Complexity</th>
<th>Knowledge</th>
<th>Frequency</th>
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<td>High</td>
<td>Advanced</td>
<td>As Needed</td>
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</tbody>
</table>

E & P Data Knowledge (In scope)

- PPDM Framework is in place for data professionals
- CPDA™ Certification
- OSDU Data Platform knowledge Must be developed
- OSUD Data Platform business users
- OSUD Data Platform technical users

Technology specific knowledge
- Data and programming languages (JSON)
- Hardware, Cloud technology

OSDU Data Platform knowledge
- In scope
- Out of scope
Building data trust is essential, but it must be earned through:
- Transparency
- Consistency and verifiable process integrity
- Disciplined thinking

User trust is supported by:
- Standard rules about data behavior and contents
- Metadata that tracks the provenance and other details that users value when deciding whether data can be trusted

The PPDM Association Rules Library contains rules that are used to validate data. Members of the PPDM Association have been building an open library of data rules for over ten years. The library’s goal is to reduce data attenuation and increase both data fidelity and trust by all stakeholders. This library will provide the nucleus of industry-agreed data rules that can be leveraged by anyone, including the OSDU Forum.

A data rule is a statement that provides the opportunity to validate compliance to expected conditions or to identify and review exceptions. It always resolves to either true or false.

Data Rules ensure that a program operates on accurate and useful data by 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.

Data rules are structured to support the needs of data systems and data professionals.

- **Concepts**, such as the requirements of measured values to be associated with units of measure, can be taught.
- **Principles** about data behavior can be embedded as general rules about how well-formed data behaves.
- **Data rules** that validate specific data elements are developed in technology neutral form.
- **Expressions** are developed using appropriate technical language to verify conformance to data rules in specific data sets.

The OSDU Forum will leverage the PPDM Association Rules Library to increase data fidelity. Leaders of the OSDU Forum have clarified that the OSDU Data Platform will rely on the library’s availability, growth and maintenance going forward. The OSDU Forum has also verified that they will submit changes to the library back to the PPDM Association in support of these goals.
Analytics processes require access to information from many sources. From cradle to grave, data systems should consider how assets can be integrated for analytics and decision-making.

Some assets, such as wells, facilities and seismic data have struggled with useful identification and version management practices in the past. Ambiguity about which data object an identifier is associated with can result in difficulty integrating and harmonizing data systems, or in properly associating business objects with data.

Clear and unambiguous identification of assets, such as wells and facilities are supported by:

- Clarity about which object is identified
- Integration that allows technical systems to work in harmony with each other
- Transparency
- Stability

The most appropriate PPDM Association Best Practice in this space for the OSDU Data Platform is the “PPDM Global Well Identification Best Practice” (shown below). Release 3 of the OSDU will not explicitly embed these principles, as methods of well identifications are expected to be implementation-based.

The PPDM Association has made all three well identification standards and best practises available to the OSDU community to provide implementors with guidance on well identification best practises.

OSDU Data Platform and implementors May Adopt Asset Identification Best Practices as Appropriate

PPDM in OSDU Status: Under Discussion

Clear Asset Identification

Industry asset identification practices are converging to ensure that data and assets are clearly interwoven.
OSDU Will Continue to Leverage the Knowledge Contained in the PPDM Data Model

Compatible Data Structures
Data container structures must prevent data attenuation. Ensuring semantic and process continuity and completeness is essential.

Tactical software systems are designed to support the needs for specific functions, but don’t support the corporate need for vendor-neutral integration and harmonization. Moving data between systems is often difficult, slow and error prone.

The PPDM Data Model contains a vast repository of industry developed knowledge about petroleum data systems. Covering over 60 subject areas, the PPDM Data Model represents untold years of deep, global industry experience. Many operating companies use the PPDM Data Model in their master data strategies. As technology begins to move beyond the traditional relational container technology, industry is determined to leverage the business knowledge contained by the model.

Many OSDU participants and team leads are also PPDM members who have been involved with PPDM programs in the past. These skilled individuals are able to leverage the work of the PPDM Association to speed delivery and improve team productivity and confidence.

PPDM in OSDU Status: Agreed
The OSDU Data Platform is leveraging the knowledge contained in the PPDM Data Model as teams incorporate the terms, definitions and relationship rules it contains. Typically, this is done by incorporating PPDM contents by reference.

The PPDM Data Model is member developed and contains nearly 2,700 tables covering over 60 subject areas. In its entirety, it covers many key upstream subject areas. Extracting this vast body of knowledge into container neutral form is a priority for the PPDM Association.
Understanding the meaning behind industry terminology can be challenging, even within the walls of a single company. Achieving industry convergence on critical vocabularies can be even more difficult.

**Governance**
A reference list contains an atomic, controlled, well defined vocabulary.

- The contents of reference lists should be managed as part of a data governance program.
- Where possible, industry standard lists should be used.
- Reference lists should include useful (non-circular) definitions.
- Reference lists may contain hierarchies, which should be explicitly contained in the lists of values.
- Selection of an appropriate value should be clear and unambiguous, ensuring that one value is valid.

**Functions**
Reference lists are used in data systems to:

- Ensure that authorized terms are accurate, appropriate, well defined and used consistently.
- Support data governance controls to improve interoperability, operational efficiency and communication effectiveness between functions and organizational groups.
- Support interoperability between systems, operators, vendors, regulators and service industry.
- Ensure that data retrieval is efficient and unambiguous.
- Support alternate terms, spellings or codes used in various systems. However, this provision must support the functions of the reference lists without interfering or introducing ambiguity.

**Semantic Clarity**

Understanding and converging on critical vocabularies is a foundation for interoperability.

**PPDM in OSDU Status:** *Agreed*

The OSDU Data Platform is leveraging the contents of PPDM reference lists as available on the PPDM website. Typically, this is done by incorporating PPDM contents by reference. As values are altered by the OSDU Data Platform working groups, they will be submitted back to the PPDM Association for consideration in the industry list of values.

**PPDM Reference Lists**

PPDM reference lists are developed to:

- Disambiguate between disparate uses of overly simplistic legacy vocabularies. “What is a Well”, “What is a Completion”, “Well Status and Classification” are good examples.
- Compile lists of useful values for industry use. Workgroups who developed various portions of the PPDM data model developed reference lists to help implementors of the model move to better convergence in content. PPDM currently has over 100 such lists and continues to add useful lists.
- Access to PPDM reference lists is available to all with a guest account.
Technological advances for analytics, machine learning, edge computing, decision support, operational awareness and fiscal prudence have enabled us to deploy business data to many processes in different ways.

As data professionals know, it is during the movement of data from one functional area to another that the highest risk of data attenuation exists. As the PPDM Association continues to extract and build on the knowledge contributed by industry experts, we will be able to better understand how data objects are formed, how they relate to each other and what their behavior should be over time and across stakeholders.

Members of the PPDM Association will integrate and harmonize existing member-developed material in order to define data objects at the same time as new materials are developed. The outcome will be powerful, technology neutral descriptions that can be leveraged throughout industry.
Summary

Work Schedule Summary

The most recent agreement with the OSDU Forum summarizes the information conveyed in this paper into four key areas:

✓ Reference Lists
✓ Data Trust
✓ Professional Development, Competence and Capability
✓ Data Objects

Throughout the process, the OSDU Forum has recognized and supported the work that members of the PPDM Association have done since 1990. Our mutual goal is to fully leverage value that has already been created, and further accelerate industry its adoption through incorporation into the Open Subsurface Data Universe Platform.

Access to PPDM Association International Petroleum Data Standards and Best Practices

Ongoing work to develop and maintain the products described in this document are mainly funded by corporate membership fees. Those who are members encourage the PPDM Association to keep as much work as possible publicly available at no charge.

PPDM Association core products can be downloaded from www.PPDM.org by:

✓ Creating a Guest account
✓ Becoming an individual member of the PPDM Association for a small fee
✓ Becoming a corporate member of the PPDM Association to support ongoing development and maintenance of these standards