

Creating Standards for Seismic Data Exchange

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Summary

Success in today's business demands mechanisms that facilitate sharing information with partners, regulatory agencies and service companies. Ideally, these mechanisms should be standardized, simple, non-proprietary and reliable. Growth in Internet based technology, particularly the XML based family of technologies for web enabled data transfer, provides a toolkit that is well positioned to support these data exchanges.

The Oil and Gas Industry, in conjunction with the PPDM Association (an International not for profit standards body), is developing data exchange schema and methodologies to support key business transactions. The Data Exchange Project is designed to facilitate interoperability between businesses within the energy industry and the business community in general. Through this initiative, Industry and the PPDM Association provide standard, inexpensive and simple solutions to what previously has been a complex and expensive proposition.

Industry representatives establish priorities for development; current activities are focused on exchanging summary seismic data, asset information, work orders and company information. Deliverables from this project include publicly available data exchange standards that are based on open source and freely available technologies such as Extensible Markup Language (XML), JAVA, and Simple Object Access Protocol (SOAP).

Introduction

Data Exchange Standards have been available to the oil and gas industry for decades; they are widely used for storing and sharing data among companies or partners, applications and data stores and submissions to regulatory agencies. The SEG P1 and SEG Y formats used by the seismic industry are defacto standards for storing and distributing seismic location and trace data.

Regulatory agencies routinely define various ASCII standard formats in which electronic data submissions are to be made. Software vendors often define flat file formats in which data is to be imported into their application. In this way, ASCII standards have proliferated in the Oil and Gas Industry.

From their earliest days, ASCII standard formats have seen their share of successes and failures. Technically, these data files are compact, well defined and efficient for storage and transmission of data. On the other hand, errors or inconsistencies in using the defined format can result in catastrophic data errors on load or transmission. Every ASCII format in use today has fallen prey to these problems.

Self-defining formats (data files that contain both structural definitions and data content) create a new opportunity for sharing and transmitting data in a semantically accurate and consistent way. Extensible Markup Language (XML), an Internet based language based on existing standards, is such a format.

Industry interest in XML technology is substantial simply because the potential benefits for improving data exchanges are profound. Providing XML based data exchange structures will enable Industry to move one step closer to interoperability.

Successes

Since Fall 2001, the project team has generated several XML schema and supporting products. Nine transactions have been completed or identified and prioritized by the participating sponsors:

- Business associate information (company information)
- Descriptive seismic summaries
- Asset and products summaries
- Support services, such as service company work orders
- Interpretation project output
- Processing input and output
- Transactions and brokerage
- Seismic field plans
- Seismic Acquisition

Business Associates

BAML Version 2 allows information about companies, people and agencies to be distributed and shared. This transaction is implemented by companies that provide standard contact information to Industry or by large companies for data sharing between departments, applications or offices.

Seismic Summary

This schema allows high-level metadata about seismic data to be exchanged with other parties. Implementers of this schema will include seismic data brokers, service companies and E&P companies.

Asset Summary

Summary information about data, information and products will be enclosed in this schema. Details about specific types of assets are managed in discipline specific subordinate schema that can be contained in the asset summary schema.

Seismic Assets

The first of several discipline specific schema, the seismic asset schema will transmit details about what products are available for a seismic set. Much of the focus is on field data and pre or post processing trace data.

Industry Offerings

Agencies all over the world are creating XML schema in many domains. Many groups have emerged to develop offerings in particular business domains; some of these are proprietary and others are publicly available. Standards bodies such as the American Petroleum Institute (API, PIDX), the Society of Exploration Geophysicists (SEG, CSEG), the Association of Records Managers and Administrators (ARMA) may also develop schema for the Energy Industry. The Data Exchange Project team will adopt standards where satisfactory schema have been developed and implemented.

This project provides Industry with much more than just schema definitions. XML technology is new; naturally there are still barriers to implementing it at many companies. Having a schema definition is a long step away from being able to populate the schema and create an XML document, send it across the Internet and then have the recipient accept and process the document to load any necessary data into a target repository.

Deliverables from this standards project include sample implementations, database mappings and documentation that are designed to help implementers understand how each product is built, what it does and how to make it work for their business needs. Consequently, the output from this project is positioned for rapid and consistent take-up by Industry.

Following is a short list of the products that are created by members of the Data Exchange Project Team:

- Architectural principles that define how schema should be constructed and how various data issues should be addressed.
- Data exchange schemas (XML) to support the types of data exchange required by industry. These schema are published on the PPDM web site (www.ppdm.org) and referenced on other XML schema sites such as www.xml.org and www.Biztalk.org.
- Mechanisms to enforce certain types of business rules and ensure data quality.
- Mechanisms to load and unload the schema from a PPDM database or a recognized industry standard format. These products are published on the PPDM web site and made available to users of the PPDM data model.
- Mechanisms that use XML to support integration of ASCII data standards (such as SEG P1) and databases.
- Mechanisms to conduct actual data exchanges across the Internet.

Conclusion

Industry driven projects to develop standards is not only feasible – it is by far the most effective and desirable way to create standards that address business needs and that work for everyone. Collaborative efforts such as the PPDM Data Exchange project enable efforts to be shared and mutual benefits to be realized; as Industry acceptance increases, so does the value of the work.

To learn more about this project or to get involved, contact the PPDM Association at info@ppdm.org.

References

www.ppdm.org

www.w3c.org

www.xml.org

www.biztalk.org