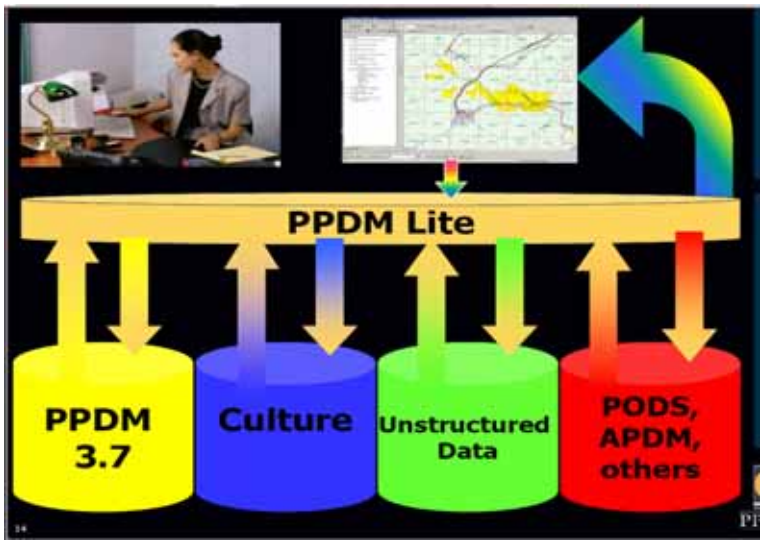
PPDM AGM and Fall Member Meeting
Calgary, November 2003



Spatial data via PPDM 'lite'[1]

About 80 registered for the 2003 Fall Member Meeting[2,3] of the Calgary-based Public Petroleum Data Model Association (PPDM). PPDM's core business is building and maintaining an upstream-specific data model, but this has been extended in recent years with various XML-based data exchange specifications and GIS-enabled versions of the data model. PPDM benefits from board-level support from ExxonMobil, Schlumberger, IHS Energy and the Canadian majors. Canadian E&P activity is booming with a record 20,000 wells drilled in 2003 and the ramping-up of Athabasca oil sands production. The PPDM acquisitions and disposals (A&D) project (an XML spec for describing assets for sale) is tailored to this fast moving marketplace. A topical reserves workgroup is leveraging the SPE reserves classification. PPDM spatial is moving into open source software with mySQL, PostgreSQL and PostGIS implementations. In mainstream (ESRI-based) GIS, an insightful paper by Lynx described the pitfalls of combining ESRI and Oracle spatial technologies. Elsewhere there was considerable debate as to the maturity and design of ESRI's Arc 8 Geodatabase. Woodside Energy presented its GeoDB – a PPDM-based corporate log data store. PPDM announced new work on a meta-model, taxonomy and well operations. Perhaps most significant is the rekindling of a POSC/PPDM 'friendship' – with PPDM's well header ML presented as a 'profile' of the POSC work[4].

Highlights

Spatial IV
A&D Data Exchange
PPDM – POSC collaboration
Lynx's spatial database
Woodside's well log data management

[1] Image courtesy PPDM Association.

[2] Resumes and papers are available on the PPDM website.

[3] This report was written in March 2004 and rolls in recent developments – notably on the PPDM Spatial project – as described at the ESRI 2004 PUG.

[4] At the PESGB data management conference some differences as to the scope of the PPDM profile emerged – for POSC the profile is 'Canadian' – for PPDM 'International'!

Contents

PPDM AGM **2**
Oil and gas industry today – Doug Uffen, Reflection Peak **2**
A&D XML Data Exchange – Geoff Zakaib, Know2Act Corp. **3**
XML Format for Depth-Registered Well Log Images - Zane Reynolds, IHS Energy, Harry Schultz, Oilware Inc. **3**
Rick Taylor A&D Project update **4**
PPDM Technical Update - Trudy Curtis, CEO/CIO PPDM Assoc. **4**
Clay Harter, Open Spirit Corp. **5**
Building a spatially enabled PPDM database – Chris Morgan and Gareth Williams, Lynx **5**
Units of Measure – John Heerema, Andromeda **5**
Geodetics – Claude Williamson, Chevron LGC **5**
Alberta e-tenure project – Audrey Murray, Alberta Govt. **5**
Well log data management – Robin Wilson, Woodside Energy Australia **6**
Data quality improvement – Paul Gregory, Intervera **7**
Yogi Schultz **7**
Oil and Gas Data Management – Wes Baird, Data Matters **7**
PPDM Spatial project – Trudy Curtis, PPDM Association **8**
Data Exchange – Rick Taylor **8**
New PPDM Work Groups – Trudy Curtis **9**
Data Management work group *9*
Taxonomy and metadata work group *9*
Well operations work group *9*
Royalties work group *9*
Summary – Neil McNaughton, Oil IT Journal **9**
Miscellany **10**
Data Matters – Reference Code Manager *10*
Auto-trol Technology – Geostation GIS and DMS *10*
Technology Watch Service **11**

PPDM AGM

Doug Opfer (ExxonMobil and PPDM Board) welcomed new members – notably OpenSpirit Corp., FileNet, Neuralog and Seismic Micro Technology. Opfer said that the PPDM sample data has been a 'big plus' for ExxonMobil and expressed interest in Spatial IV, the personal Geodatabase and PPDM 'lite'. Jo Tischner has been taken on to market PPDM in Houston. PPDM's marketing effort includes attendances and presentations at PESGB, SMi, NAPE and the SEG. Paul Coward noted the ongoing presence of IHS Energy – Tim Hopkins of IHS has replaced Pete Stark on the PPDM board – as a 'passport to internationalization'. IHS Energy leverages the PPDM Data Model in its P2000 database. PPDM is still run on a shoestring. Total revenues for fiscal 2003 (ending July 2003) were $CDN 750k – one third coming from work group sponsorship.

Oil and gas industry today – Doug Uffen, Reflection Peak

2003 was notable for Russian production overtaking Saudi Arabia and of course the Iraq war – which created a 2mm bbl. shortfall and brought the world economy 'near to the economic danger zone'.

Demand is trending up – to a forecast 130 mm bbl. in 2025. Canada's oil sands hold an estimated 175 bn. bbl. recoverable reserves and current production of 900k bbl./day is set to double by 2010 – although 'Kyoto issues' hang over this energy-intensive production. West Canada gas wells currently average 25% decline per year! But 2003 will be a record year with 20,000 wells drilled. The 'Royalty Trusts' are a new feature of the Canadian oil industry – and are 'exporting capital' from the industry to shareholders. Moving over to e-commerce, Uffen argued for a 'simple consistent model' – SCM – standards are required to make this work. But locally acceptable standards are problematic in global e-commerce – the lack of taxonomies is an impediment to take up.

A&D XML Data Exchange – Geoff Zakaib, Know2Act Corp.

There is a need for a common 'vocabulary' for Oil & Gas. Metadata, taxonomic, schemas are all such common vocabularies. These need to be 'fit for purpose' standards, 'we don't want to create new standards bodies'. There is regulatory impetus coming from the Sarbanes – Oxley act. The issues are '80 % people challenges' and only 20% technical. In upstream A&D business an asset purchaser may need to visit 10-20 websites, viewing data in a wide variety of formats like html, pdf, Word etc. Such data cannot be input into spreadsheets to enable business processes. Often the quality of information is very good but locked to proprietary formats. Collaboration efforts abound – with eight industry bodies from AAPG to SPE and the W3C etc. There is a need to pull these groups together and to inform them of what we (PPDM) are doing. The PPDM A&D project has 12 company sponsors and is working on an 'extensible petroleum A&D language' XPADL. Zakaib asked if there should be a Petroleum A&D Association, possibly in association with PTAC. First PPDM A&D deliverable is an XML Schema for Initial Offering Memoranda of publicly available information. This will help brokers display info in a usable manner and will support one stop shopping – allowing for database query of A&D offerings. The PPDM A&D project takes a modular approach – starts with hi-level information and allows drill-down and out to SEC information. Economics, discount rate can be rolled in making the format applicable internationally. The project will link to other PPDM data exchanges. PPDM and POSC 'need to work together,' possibly with a MOU similar that signed between POSC and PIDX. Note that 'Adoption begins at home.'

Also ran :

EBXML 'becoming a standard'

XBRL: Business reporting language for accounting – see Hitachi systems. Currently online systems like SEDAR and EDGAR use pdf/Word

E&P catalogue ex Shell Expro - donated to POSC and 'usable by anybody'

POSC E&P business process model (also donated) includes A&D.

XML for Depth-Registered Well Log Images - Zane Reynolds, IHS Energy, Harry Schultz, Oilware Inc.

The authors note a proliferation of software for handling depth registered logs from Geographix' X-Section, Geoplus Petra etc. There is a need for a standard exchange format to handle well log image, well header, tool sketch and manage different scales. Registration should capture any number of control points. Schultz described XSLT as 'wonderful to use – miserable to write' before plugging Oilware's EZTools product. EZTools was used to populate a PPDM database which proved easy to extend to raster formats. The well log and records management modules were used via a linking table. The attribute RM _ Physical_Item[5] stores the location of the TIFF image.

[5] How did a TIFF image become a 'physical item'?

A&D Project update – Rick Taylor, PPDM Association

Phase I - Scope Initial Offering Memorandum (IOM – see above) summary, create a schema and map to PPDM. This will not be a 'direct representation' of the PPDM Model. Demo to be built with Structured Vector Graphics (SVG) diagram in Internet Explorer. Plan to complete schema of XPADL[6] documents.

The problem is the multiplicity of representations of asset information as below.

Asset Holder			
Broker			
PDF	HTML	Excel	Word
Buyers browse and re-enter data to applications			

XPADL/IOM documents will remove the need to have multiple formats. XPADL schema is to be developed with PPDM architectural principles and a modular process leveraging BAML, SEISML and WellHeaderML. Location information will be GML[7]-based. Deliverables will include Schema Set for IOM mapping to PPDM, Reference Guide and documentation, a Sample Instance Guide and Java tools to load/unload ex PPDM to schema. V 0.1 a 'rough cut' is available on the PPDM website. The A&D language project is backed by ARC Energy Trust, Schlumberger, AJM Petroleum Consultants, Talisman and 6 others.

Q&A

What is the timing of Phase II?

Plan to start in the next few weeks – but the project is virtually out of funds; it's 'up to you'.

What do the brokers think?

They see the value – we should not bypass them.

PPDM Technical Update - Trudy Curtis, CEO/CIO PPDM Association

Curtis announced a new 'tweaked' data model, implementable in SQL Server or mySQL. Pat Schaefer (ExxonMobil) is now on the modeling committee. PPDM's next generation **Version 4.x** is under discussion with the options of an object oriented database, spatial data, or the W3C database recommendations. A PPDM globally unique identifier (GUID) is to be included all tables and every row will have a date time stamp and quality metrics. Other issues include units of measure and a Meta–model (a model of the PPDM data model itself). Well data is evolving to embrace test and production data. Sample data set is evolving. The PPDM model is being validated in discussions with other organizations including ARMA/ AIIM (record management), CAODC (well operations), CAPLA (land), EPSG (geodetic), IEEE (electronics/informatics) and PODS (pipeline).

The **Reserves** Work group is complete leverages reserves classes of the Society of Petroleum Engineers. **Well Log** has been tested with sample data from the POSC Practical Well Log Standard (PWLS) initiative – but it has not proved 'practical' to populate all PWLS data set to PPDM! **Land** is now complete, very detailed and complex.

Curtis notes the 'changing focus' of XML – originally used for data streaming, now for viewing, integrating and editing. XML is used in PPDM documentation and on the spatial project.

Q&A

Is the XML well directional survey being used?

It's too soon to say.

What progress has there been on PPDM compliance?

[6] XPADL – 'Extensible Petroleum Acquisition and Divestment Language'.

[7] Geography Markup Language.

We have defined and are promoting two levels of compliance: 'gold' table-level compliant with 'pure' PPDM in original form and 'silver' which allows for compliance through database views.

An Open Spirit server for PPDM? – Clay Harter, Open Spirit Corp.

PPDM has arguably been more successful than POSC – but even so the concept of a single data base has met with limited success. The alternatives are – to use a single vendor solution, a data transfer mechanism or an integration framework *à la* Open Spirit. Open Spirit Corp. is talking to[8] a number of customers about a PPDM data server for OS.

Building a spatially enabled PPDM database – Chris Morgan and Gareth Williams, Lynx

Lynx want to 'embrace' the ESRI Geodatabase. Lynx's first spatial project was custom-built for Pelican (now DONG Norge) to access Norwegian data from NPD, internal data stores. And weekly PetroBank downloads. ArcView was not really designed for this sort of multi-table database unlike PPDM. ArcView is also a 'formidable' tool for end user. Lynx has now tested and evaluated each phase of PPDM spatial. The dataset implemented by Lynx only comprises a fraction of the full PPDM model. After analyzing the ArcSDE simple feature database and the ESRI Geodatabase, Lynx went for Oracle Spatial. This was because of the advantage of a published geo-format – accessible through standard SQL. The downside of this choice was that ArcSDE is still required making for complex deployment. There were issues with SDE/SDO interaction – especially with different project systems. Wells and 2D seismic were implemented in Oracle Spatial. Seismic lines with shotpoint values were implemented as 'measures'. An ArcView client accesses well and seismic data in Oracle Spatial – the rest of the GIS data is accessed in flat SDE layers. ArcScene also used to view deviated well paths in 3D. Lynx is now looking to an ArcIMS web interface. Lynx hopes to 'punch above its weight' with this European implementation of PPDM and to persuade others to take up the PPDM model.

Units of Measure – John Heerema, Andromeda

The PPDM 3.7 Units of Measure project was a 'low budget' attempt to build a UOM infrastructure for PPDM. Appears to be more of a fact finding mission – with analysis of SI, US Customary, British Imperial UOM systems. Industry implementations by IEEE, API and POSC add a level of complexity. Much was made of the fact that POSC's temperature formula 'does not work'.

Geodetics – Claude Williamson, Chevron LGC

Key geodetic attributes were 'misplaced' in the PPDM data model – this is being fixed by modifying around 10 tables. Geodetic data will be populated using the EPSG V 6.2 standards – by mapping EPSG to PPDM. Java code to populate model has been developed by Jaeyoung Suh for PPDM.

Q&A

A flag should indicate what geodetic transformations should be used.

Major changes (for the data model) are in prospect as N. America migrates from NAD 27 to NAD 83.

Yes this should have been done years ago. The cost will be 'dramatic.' We have a problem!

Alberta e-tenure project – Audrey Murray, Alberta Govt.

The Alberta Government, which owns 80% of all mining rights, currently receives 14,000 paper title transfers per year. The Government uses PPDM in its LSAS titles management system (titles). The e-tenure business case was approved in March 2003. A pilot will be rolled out in March 2004. Online bidding is to start in 2005.

[8] Open Spirit is in discussions with major Canadians and International Petrodata Ltd. re a PPDM server.

Well log data management – Robin Wilson, Woodside Energy

Work on Woodside's 'Geo DB' also known as 'epiDB' started in 1997. This is a 'single source' corporate database for exploration and geoscience data (see last year's PPDM presentation). In the planning phase, data was categorized as to its importance – from 'at risk of loss' down to 'nice to have'. The well log data system started mid 2002. At the time PPDM 3.7 was in Alpha so Woodside went with V 3.6. (a mistake!) Software development is not core business to Woodside and needs a strong business case. Prior to the epiDB project Woodside data suffered from:

- duplicate data, locations
- currency – which data is current?
- data loss because of poor data management
- bottleneck in data flows
- connectivity
- poor access

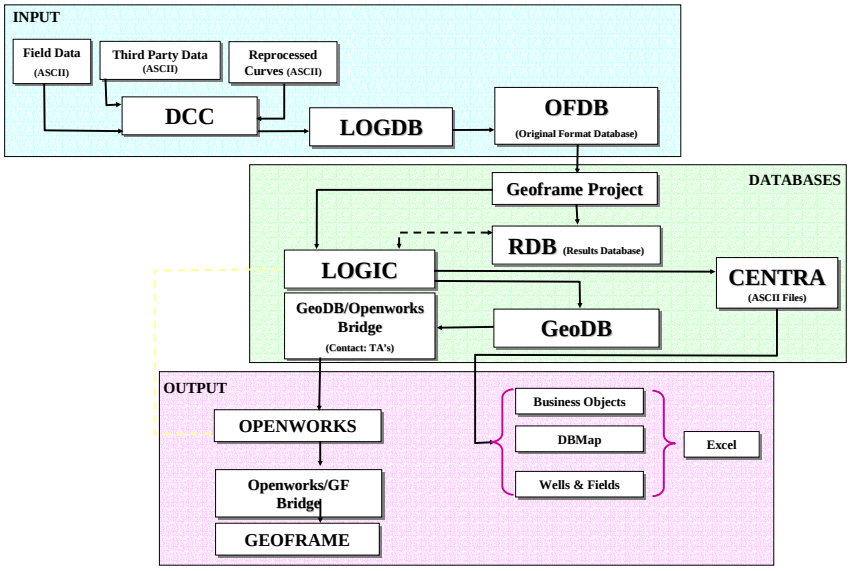


Figure 1 Initial workflow - significant data replication[9].

All in all 'a dog's breakfast' according to Wilson. In a cost cutting drive a 'hard' decision was made between OpenWorks and GeoFrame. In the end, Woodside being a Landmark shop, it was GeoFrame that was 'let go'. Only final QC'd log data is merged into a single file in the corporate database. LAS V2 is the format of choice for all scalar data. LAS data is loaded to PPDM database with a web-based loading tool. LAS files are saved to CDB as binary large objects (BLOB). Curve values for 38 standard curves are loaded into Oracle tables. This is 'not as crazy as you might think'. LAS V 3 not supported by LOGIC (Shell Petrophysical system) so uses DLIS for Vector data – this proved 'very time consuming and hard to use'.

[9] Image courtesy and © Woodside Energy Ltd..

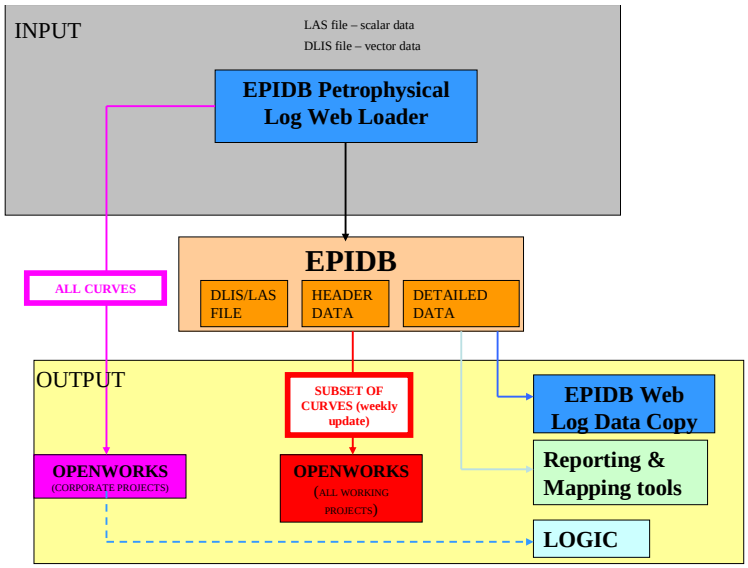


Figure 2 New workflow - minimal data replication[10].

Woodside uses Business Objects reporting tool, ESRI Arc GIS mapping and Petrosys dB Map. ArcGIS was even used to display a log! The PPDM auditing fields were dropped which gave 'several orders of magnitude' improvement in performance.

Data quality improvement – Paul Gregory, Intervera

An exhortation to improve data quality. Some interesting 'factoids' – in 2001[11], 33% of companies' technology implementation projects were delayed or scrapped due to data migration and quality problems'. Basically an infomercial for Intervera's solutions to data cleanup. Business risks of poor data quality include non-compliance with well abandonment regulations, inability to respond to public complaints and incorrect environment and regulatory reporting. Gregory's presentation got a strong endorsement from Gary Demofsky of the Alberta Energy and Utilities Board (AEUB) who emphasized the importance of good data reporting which will impact future permit applications. There is a lot of concern and interest in the reporting of land data.

Business process improvement – Yogi Schultz, Corvelle Consultants

Exploding data volumes threaten to overwhelm business process improvements. 'We have achieved major gains in productivity – time spent looking for data is down by 50%'. But set against such improvement is a growth in data volumes estimated at 36% per year. IDC reported that 180 PetaBytes were shipped in 2nd quarter 2003. Workflows beget their own data – which is kept, not managed. The solution - Gigabit switched Ethernet, redundant routing, sub-nets, load balancing. Database performance optimization through smart disks with look-ahead cache, SAN/NAS etc. On the software front, application portfolio rationalization is the way to go – it's hard today to keep both GeoFrame and OpenWorks – and harder still to 'add the complexity' of OpenSpirit. Enterprise Application Integration (EAI) 'should be explored and exploited to reduce redundancy and improve integration'. A multi-tier application architecture is the goal. Companies should 'favor PPDM': a single vendor solution 'isn't going to work – there will always be innovative new applications'.

Oil and Gas Data Management – Wes Baird, Data Matters

Most oils in Calgary have a PPDM implementation either at the centre of the corporation database – or as the core of other in-house developments. But once deployed, the model tends to drift away from the 'norm'. There is a need for a 'read-only' PPDM model to support 'plug and play' applications. But for

[10] Image courtesy and © 2003 Woodside Energy Ltd.

[11] PricewaterhouseCoopers Global Data Management Survey.

Baird, data and applications are the tip of the iceberg – there are many 'hidden' issues. PPDM is currently an 'all or nothing' schema which is a potential security problem. This should be fixed with a more modular approach supporting application role management. Baird advocates the deployment of an 'amalgamation database' – a PPDM-based, vendor neutral corporate store for high-level data.

PPDM Spatial project – Trudy Curtis, PPDM Association

Curtis traced the history of PPDM's 'spatial' projects. Spatial I (1999) was a generic process for spatial enablement (using an intersection table linking a business table to a mapping tool). Spatial II (2002) was an SDE-specific development – followed in 2003 by Spatial III – built around ESRI's Geodatabase. Successful deployment of various flavors of Spatial come from Woodside Energy, Yukon Territorial Govt (1 ½ days to spatialize PPDM II) and Nexen – involved in Spatial III and IV. Spatial IV involves the creation of a 'simplified, denormalized' data model aimed at spatial data as used in the upstream. The data model is referred to as PPDM Lite or PSDM (Petroleum Spatial Data Model). A 'thematic' data model will be published on www.esri.com. Three implementations are planned – ESRI 8.3, Oracle 9i and an open source PostgreSQL/PostGIS implementation on Suse Linux[12].

Q&A

> *Gary Demofsky (Alberta Energy and Utilities Board) expressed reservations with the linkage of the PPDM data model with a second Geodatabase. A related issue is the poor implementation of table joins in the Geodatabase. The Geodatabase is 'wrong' – it has not been designed for relational queries, is basically a silo. Workarounds are possible with Oracle SDO – but push/pull triggers are non-trivial parts of the equation.*

Data Exchange – Rick Taylor, PPDM Association

The business associate 'ML' (BAML) was a direct dump of a part of the PPDM model. Subsequently the XML-data modeling approach has evolved to align with work done in POSC and API/PIDX. In 2003 POSC's Well Header ML template was extended to a PPDM 'profile'. In 2004 directional survey will be rolled into the XML data exchange program. Significantly, POSC and PPDM are sharing standards, collaborating on modular technology. The 'new level of cooperation' is a two way street. Taylor described his relationship with POSC's John Bobbit as excellent – Bobbit is 'very responsive, a joy to work with'. But Taylor warned that module replacement could prove a double edged sword for standardization. There is a need for profile area hierarchization and recommendations on minimal conformance for profiling. See the PPDM website for a sample well package, mapping to the PPDM Reference Guide. Work in progress on Tech Docs XMI[13] – an XML-based version of UML – download & create model. Data Exchange projects are being implemented by Nexen (well header), EnCana (Seismics and well header and directional survey). Others including the US Minerals Management Service and Petrosys have also expressed interest in the technology. Taylor concluded with a neat demo of the use of XML deviation data, an XSL stylesheet and Scalable Vector Graphics (SVG) to plot a 3D well trajectory. This can be viewed and rotated in a browser with the SVG plug-in. Tayor emphasized the need for POSC and PPDM to cooperate to leverage three years of schema development – and to 'help industry understand the role of the schema'. Allan Doniger (POSC) returned the compliment with an endorsement of PPDM/POSC collaboration.

[12] This information added subsequent to the 2004 ESRI PUG.

[13] XML Metadata Interchange (XMI) 'enables interchange of metadata between modeling tools (based on the OMG-UML) and metadata repositories'.

New PPDM Work Groups – Trudy Curtis

Data management work group

The data management work group sets out to 'make PPDM work better'. According to Curtis, this is in part driven by Sarbanes - Oxley requirements for record retention, disclosure and privacy legislation. The project will leverage the PPDM meta model.

Taxonomy and metadata work group

The taxonomy/metadata project plans to leverage Shell-Flare-KID[14] derived management strategies – rolling in the W3C, Dublin Core, Web Ontology Language (OWL). The plan is to support taxonomoy and metadata in PPDM using W3C standards and the existing POSC catalogue. Curtis observed that taxonomy has been used by records management professionals for years.

Well operations work group

Existing PPDM work supports operations but is less appropriate for data retention and re-use. The work group will extend the model to Well Tour reporting with compliance reporting and record retention. The intent is not to support real time – this is handled by WITSML.

Royalties work group

Also ran…

Summary – Neil McNaughton, Oil IT Journal

Neil McNaughton commented on the presence of IHS Energy on the PPDM board[15] – a 'passport to internationalization' according to Paul Coward. Another significant endorsement – again from a board member – came from ExxonMobil's Doug Opfner, who described the sample data set as 'a big plus for ExxonMobil'. Doug Uffen's call for a 'simple consistent model' found later echoes in the PPDM 'lite' initiative. Although Uffen's other plea – for a 'plug and play' implementation – did not get so much support. Inspired by the many XML-focused presentations, McNaughton suggested that through the XML schema, the programming community can and should achieve validation. From validation, it is only a small step to a measurable form of compliance – the holy grail of the standards organization. Lynx's talk and other comments underscored the tradeoff between GIS deployment and database integration – robust decoupled solutions to this problem are another 'holy grail'. The subset of the PPDM model – PPDM Lite may be relevant here. Woodside's case history was particularly illuminating – showing how decoupling data management from applications gave flexibility in choice of software solutions. Yogi Schultz' remarks on the undesirability of a monolithic data store should be a wake-up call to designers of the burgeoning PPDM data model – with 10,000 tables and still counting. McNaughton opined that there might be a need for a PPDM 'lite' which was not spatially enabled – in the interest of decoupling and offering easily deployed basic model functionality. The renewed dialog with POSC is very encouraging – and should benefit both organizations in the eyes of industry. McNaughton concluded by congratulating Trudy Curtis on her appointment – and the PPDM association on its massive program and enthusiastic execution.

[14] Knowledge Information Data.

[15] For current board members visit the PPDM website.

Miscellany

Data Matters – Reference Code Manager

Reference Code Manager freeware changes primary key values to new values. Also Content Viewer – data content discovery from an Oracle schema and Application Role Manager – for managing a PPDM installation. More from www.datamatters.com.

Auto-trol Technology – Geostation GIS and DMS

Geostation GIS – E&P interactive mapping package.

Konfig CM – a 'configuration management' system – data, document and PDM workflow solution.

Technology Watch Service

This report was produced as part of The Data Room's Technology Watch Reporting Service. For more information on this subscription-based service please visit the above link or contact

The Data Room
7 Rue des Verrières
92310 Sevres
France

Email info@oilit.com
Tel +331 4623 9596
Fax +331 4623 0652

2003 Technology Watch Program		
Date	**Conference**	**Location**
10-11/02	**SMi Data and Information Management**	**London**
11-12/02	**EU SCADA Conference**	**London**
10-12/03	**ESRI Petroleum User Group**	**Houston**
12-14/05	**AAPG Annual Conference & Exhibition**	**Salt Lake City**
12-13/05	**Lifecycle Process Management**	**London**
20-21/05	**IQPC Oil & Gas Knowledge Management**	**London**
22/05	**POSC Member Meeting**	**London**
28-30/05	**PNEC Data Integration Conference**	**Houston**
10-11/06	**Landmark European Forum**	**Aberdeen**
29/09-1/10	**Schlumberger information solutions Forum**	**Miami**
6-8/10	**SPE ACTE**	**Denver**
20-22/10	**AspenTech European user conference**	**Paris**
27-29/10	**SEG Conference and Exhibition**	**Dallas**
3-5/11	**PPDM AGM** 🗎	**Calgary**
8-9/12	**PESGB Data Management**👥	**London**

🗎 Summarizer 👥 Session Chairman

In BOLD – have been reported as The Data Room Technology Watch program. Others in note form – information available on request.

