

Smi Data and Information Management London, February 2007

Around 80 attended the 9th annual SMi E&P Information and Data Management¹ conference in London. In his keynote address, **ExxonMobil** reported on a PricewaterhouseCoopers' study that found ongoing dissatisfaction with access to real time data. Comstock compared the large sums spent on ERP implementation with the less well endowed upstream data environment – where the 'dividend' of better management of the data asset is potentially much greater. Comstock also warned of the true cost of managing additional storage which is around ten times the cost of hardware. This is particularly important in the face of proliferating copies of the same data across the network. **Shell** reported on its 'smart' wells and fields that are contributing to 'operational excellence' at the expense of a degree of data 'overload'. **OMV** is embarking on 'ISIS' a significant IM project that is currently addressing data quality and standards before addressing the wider issues of data update and decision support. **BHP Billiton** is leveraging GoogleEarth in its EarthSearch portal on its 'multi dimensional' data assets in what is one of the first full scale deployments of Google's Enterprise Services for oil and gas.

A **Schlumberger** survey of clients found that the main production data management application is Microsoft Excel, also widely used in the context of business intelligence (**Knightsbridge**). The problem with Excel is that it is generally used with little or no back-end data management – with unmanaged data accumulating on users' C:\ Drives. **Landmark** presented a new approach to blending structured and unstructured data as a part of its new Information Management and Infrastructure (IM&I) service offering. **Troika's** presentation provided an update on SEG tape standards activity and also heralded the move of the European Petroleum Services Group's (EPSG) coordinate reference system (CRS) data resource to the Oil and Gas Producers Association (OGP). The definitive CRS dataset will soon be available as a web service. **Petrolink** described the localization of its well site data management package as Pemex' CADI system – variously presented as a decision support system for Pemex' operations and as a pre-processor for Pemex' @DITEP database. The **round table** discussion ranged widely from data management to knowledge management and the return on investment from such activity. Shell's Thierry Gregorius proffered an iconoclastic view on the ROI debate, on 'knowledge management' in general and on the automation of 'risk management'.

Highlights

[Landmark's IM&I offering](#)

[Petrolink's localization as Pemex' CADI](#)

[BHP Billion's experience with GoogleEarth for oil and gas](#)

[vMonitor in Nigeria](#)

[Round Table discussion](#)

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Technology Watch subscription information

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¹ <http://www.smi-online.co.uk>. Documentation from the conference can be acquired from http://www.smi-online.co.uk/event_media/overview.asp?is=5&ref=2465.

TW0702_1 Chairman's introduction – Najib Abusalbi, Schlumberger

The industry has seen rapid growth and technological progress. Oil prices are softening but remain high. We are seeing a migration of talent across world geography. All companies have set goals to achieve step changes in productivity in the context of heightened environment and emissions sensitivity and increased social responsibility. All of which should be seen as a business opportunity. With the 'acceleration of innovation', one can legitimately ask, 'if everyone is innovating, how do we differentiate our offer?' A meeting of the SPE R&D council was held last week to look into such issues. *(No answers available as yet).*

TW0702_2 Keynote Address – Steve Comstock, ExxonMobil.

Comstock polled the audience to ascertain that it was split roughly 50/50 between IT and the business. ExxonMobil (XOM) views data management as an IT/Business partnership. Multiple single point solutions must integrate an enterprise framework to enable data sharing. XOM's upstream company also has to integrate with its global IT. A PricewaterhouseCoopers (PwC) study² found that '62% of data is 'managed' in Excel spreadsheets by end users.' This means that there is no enterprise level control over data which may have reporting implications (Sarbanes Oxley). The PwC study also found that '63% of those surveyed were dissatisfied with access to real time data.'

XOM's view is that data is so important to the business that it should be 'elevated to the same level as reserves.' So in XOM's organization, global IT (GIT) has a say in infrastructure, applications, data architecture and support. Exxon's Common Computing System (CCS) comprises network, platform (Linux, Unix, the new Vista 'challenge'), applications and 'user experience'. The CCS 'has data at its core.' The idea is to avoid user interaction with the platform (operating system). Companies should beware of the impact of 'data management amateurs.' Without the proper processes and controls in place 'people could go to jail.' Comstock encourages the training of career DM professionals and the education of non DM professionals in proper data hygiene.

The Society of Petroleum Engineers has recognized IT as a critical part of the business and intends to formalize IT training. Today, at Texas A&M all you need to get an engineering degree is Fortran and Cobol. The result is that some people coming into oil companies 'don't know what they are doing.' All of which contributes to 'data entropy,' with the Excel spreadsheet as part of the vicious circle. Poor management can turn data into a 'tax' on the organization. On the other hand, good management delivers a data 'dividend,' allowing the business to leverage its data asset.

Lifecycle data management spans exploration, drilling, production and financial/regulatory. Operations people may bow to SAP folks rather than back populate petrotechnical data stores ('our bill from SAP is huge!'). But in fact the reward from good management of surface/facility data is arguably higher than that from SAP and may be highest for subsurface data. Comstock sees plenty of opportunities for more industry emphasis on infrastructure and applications (search engine tools, data warehousing, content management systems.) Other DM opportunities exist in industry standards, master critical data, best practices (managing the golden data 'nuggets' rather than stuff that will never be used again) and integrating data within data realms and across domain interfaces. This will likely involve a shift in IT focus from operations to enterprise information. Partners are encouraged to develop a shared understanding of XOM's IT concepts. On the topic of outsourcing, Comstock warned against shifting high end data to a distant location.

Online geophysical data is growing in leaps and bounds, with terabytes online. Data storage hardware costs are a drop in the bucket compared with what it takes to manage and serve the data. It may cost around \$50,000 to add a TB, but it will cost around \$500,000/year to manage the same. The business always pushes for more disk space and it is important to make the business aware of the true cost of 'making the haystack bigger.' IT needs to measure and engage the business in such discussions. Measurement can be by standards use, metrics of data ownership, quality, usage and level of data redundancy. A recent North Sea audit found 250,000 copies on the LAN of the same business data! Comstock returned to the relative merits of technical and financial data management. XOM units spend \$10-30 million on SAP – 'you could do a lot with this in the upstream!' Industry still needs greater emphasis on the data management discipline, process and people. Data is the basis of an effective IT architecture

Q&A

How do you enforce standards adhesion in XOM?

We benefited from the Exxon – Mobil merger which made it easier to get a mandate. We offshore where applicable and have hired 10 people in Bangladesh.

² *Of financial data management – not oil and gas specific.*

On the subject of DM professionals, none of ours are from IT, most are geoscientists.

We still have a lot of embedded IT activity so we have tried to create a role model where DM is a career function. But everyone needs to rotate through IT. XOM has defined skill areas of DM, geoscience computing, engineering computing.

TW0702_3 Production data management – Donna Garbutt, Schlumberger Information Solutions

Garbutt's introductory poll established that about half the audience had experience of field work. A Schlumberger survey of customers' challenges had 500 respondents worldwide. It determined that the main production data management application is Excel. So efficiencies are there to be had by moving to a true production management system. The survey found that production performance problems generally resulted in delays of several days. Production equipment issues resulted in delays of minutes to hours. There is a break in data flow from the SCADA world to longer term business requirements. The survey polled users as to how much time they thought they would save by automating the workflow (up to 20 hours per week). The survey found that production monitoring, water injection, deliverability analysis, well test, production loss monitoring, surface water handling, artificial lift, sand, gas lift and zonal allocation³ were all 'priority problem workflows.'

Garbutt concluded with a brief description of a production optimization project in one of Devon Canada's mature gas assets performed with AspenTech. The 'traditional Canadian brownfield environment' leveraged Avocet to help investigate de-bottlenecking issues with compressor capacity. The economic viability of extra wells was studied as was the possibility of adding compressor capacity and stopping shipping overflow gas. In the event, the updated Petrel reservoir model identified leaching of gas from a neighboring field!

Q&A

Statoil – Much of our current R&D focuses on improved recovery and RT optimization. But the trouble is that SIS does not understand production accounting and advanced process control. We all need a better understanding of these domains.

No, in fact we are very active in these areas – particularly with ProdML and in the Statoil/ TietoEnator/SIS pilot.

What are your differentiators in this space?

Using tools like ProductionWatcher⁴ lets you anticipate issues of compression capacity or lack of pipe, spotting problems ahead of time. This bridges the gap between real time SCADA systems and model-centric approaches.

How do you assess the impact of change management and HR issues?

There is a missing business discipline centered on risk and uncertainty – training is required.

TW0702_4 Data overload from the smart field – Femi Adeyemi, Brunei Shell

Shell's Digital E&P Business includes smart, snake wells, real time data integration so that engineers can log on and 'work on valves and gauges thousands of miles away,' all a part of the 'Smart Field Value Loop' of 'measure, model, decide and execute.' Shell's 'Operational Excellence Model' was also mentioned briefly. Today Shell experiences data 'overload' and is working to sort wheat from the data 'chaff.' DM challenges include globally unique identifiers and taxonomies.

More time is spent on access/manipulate data rather than 'real surveillance' – analysis and interpretation and action. Security is problematic in the real time data environment. Shell deploys the 'latest internet technology firewall' to separate the distributed control system (DCS) from the internal 'office' domain. Shell is beginning to treat data like HSE. Data-driven models use real time data for 24/7 surveillance and optimization. This is very dependent on communications and the network configuration. Looking ahead, Adeyemi sees collaboration centers and automated workflows for production – taking the 'human approval' step out of the production optimization loop⁵.

Q&A

ONGC – Data Quality?

³ *That's just about everything !*

⁴ <http://www.slb.com/content/services/consulting/dcs/geoscience/productionwatcher.asp>.

⁵ Reference was made to the Petex Suite from Petroleum Experts – see <http://www.petex.com/leaflet.pdf>.

We use the Information Quality Metrics (IQM) tool from Exprodat⁶. This builds queries that look into subsurface databases to check how many wells there are, their names to identify problems. IQM gives a quality score well header data. Its also does asset data ‘traffic lights’ beautifully. Suddenly people start asking questions about data quality improvement.

TW0702_5 Slow but steady growth in oil and gas e-commerce – Bill Le Sage, OFS Portal

Commercial data – field ticket, invoice, SEC reporting. Upstream oil and gas spent \$265 billion in 2006. Regarding e-commerce in oil and gas, Le Sage believes that ‘we are at the end of the beginning.’ It has all proved to be a lot harder than anyone thought, although now, PIDX standards have really taken off. In the supply chain, catalogs are ‘data.’ These include sheets of previously negotiated prices. These are rarely used for sourcing except for easily catalogable products. Now, almost all business transactions are PIDX standard XML documents which provide transactional (spend) information. The next growth field is business process standards.

Business to business (B2B) transactions are mostly between large companies and most of the spend is on services. Today the focus is on electronic invoicing, procurement and payment (eIPP) and on spend transparency. For some, e-invoice is a great improvement and some suppliers are ecstatic because they are now paid on contract. Because of the high proportion of service contracts, the real value is in complex products and services. One supplier catalogs 800 types of drill bits. SAP ERP can’t handle ‘non explicit’ purchases which may be a couple of lines of text. This is a different mindset. OFS is now working with SAP to streamline workflow. Near term big wins will accrue from spend analysis and reduced invoice processing costs, leveraging the UN SPSC codes⁷.

Q&A

Compliance with trading partners?

OFSP was established with the aim of making contractual relationship. We found that PIDX was the de facto standard.

What of embargoed countries –how do you address regulatory interference/supervision?

PIDX has a global process work group to focus on country specifics. Some countries need a ‘wet ink’ signature. Mexico is now driven by transparency requirements.

TW0702_6 Structured and unstructured data management – David Holmes, Landmark IM&I⁸

Corporate IT likes unstructured stuff – email, documents etc. but they will ‘manage’ it for you even though they don’t understand GeoFrame etc. The trend has been to tie stuff together with web portals. But this means that users have to leave their application environment. In other words, portals as sticking plaster. Little has been achieved regarding managing structured data and standards. Landmark has been researching this over the last 18 months and has found that ...

- In context integration is critical – Landmark’s 3D Drill View offers ‘info boxes’ attached to well bores that expose critical information elements regarding drilling difficulties etc. This is achieved through Decision Space middleware.
- Web technology must add value. ‘I don’t want to knock it, WITS/PRODML it’s great stuff, but you do have to exercise caution otherwise you’ll just get another web portal.’
- Security is critical. It is surprising that customers have tolerated the situation of multiple identity management offerings of today’s vendors. We should rather leverage a corporate identity management model.
- Rich search is important. Has anyone tried the Google Appliance? This works great on file servers etc. But it point at OpenWorks or GeoFrame and you’ll find that it doesn’t understand entitlements. So anyone with access to Google can suck out the whole database!
- Structured and unstructured are of equal value.

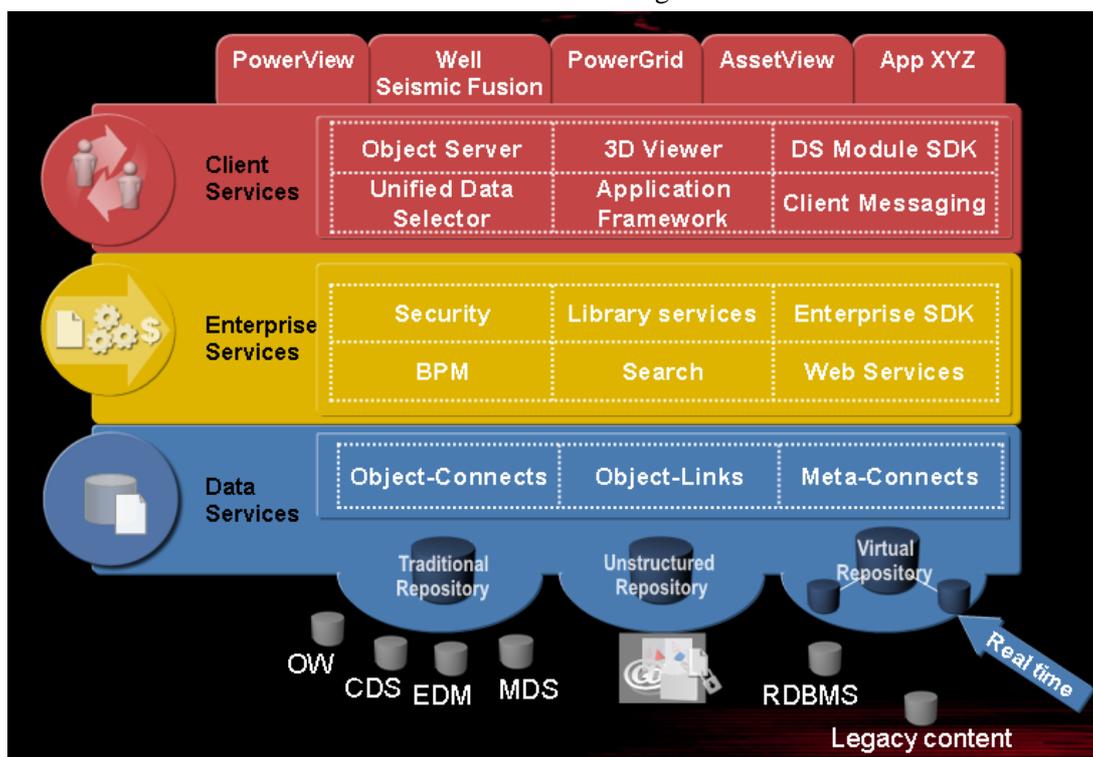
Often unstructured is that way because it’s easier. For instance in the context of hiring a new staff member, you have the job title, salary, position in an email. But these elements are in reality, structured data. Also, in an ideal world, we would like to track offers made. Landmark’s research concluded that vendors need to create ‘hooks’ to allow such integration of structured and unstructured data. But this cuts across vendor boundaries and vendors need to adopt a ‘truly open approach’ and provide interfaces to their data stores, middleware and applications.

⁶ See <http://www.exprodat.com/content/main.asp?pid=49>.

⁷ See <http://www.unspsc.org/>.

⁸ *Information Management & Infrastructure*.

Vendors ‘are naughty in this respect.’ Why haven’t oils done anything about this? Today, vendors compete as to who is ‘openest’ of them all. Oils need to call vendors (that includes us) to account and build best of breed solutions through openness. Horizontal commodity technology exists to solve the integration challenge but needs to be customized. Tools like Livelink and Documentum also need customizing.



DecisionSpace Environment

Landmark’s offering in the unstructured/structured data management environment is provided by its Information Management and Infrastructure (IM&I) unit and the DecisionSpace (DS) ‘open’ integration platform. DS defines a service layer, making client services available from published SDK⁹s. DS adds ‘enterprise services’ for security, search (that is ‘contextually aware’ of the upstream) and ‘standards-based’ identity management. Data services provide access to OpenWorks and third party data sources¹⁰.

Q&A

Comstock – if blue boxes are not portals what are they?

Java APIs provide common interfaces to data stores.

Oil IT – Did you check out the W3C’s ‘semantic web’ technologies¹¹, RDF and SKOS in your research – these address structured information embedded in emails and such?

No.

Is this ‘son of’ OpenSpirit?

⁹ Software development kit.

¹⁰ In view of the strategic nature of this re-positioning of DecisionPoint, we asked David Holmes to describe the new functionality in his own terms. ‘We have over the last year been focused on bringing clarity and definition to the DecisionSpace environment. We are now defining DecisionSpace as **the** environment for multi-disciplinary integration and optimization. A key differentiator in our strategy is to provide open and extensible connectivity to Landmark, proprietary and third party applications and data stores, thereby preserving our customers’ current investments and providing flexibility for future investments (this includes support for OpenSpirit). In addition, DecisionSpace provides the enabling technology for the Digital Asset. The research that we have carried out examined issues surrounding the integration of structured and unstructured data is a component of our DecisionSpace strategy. Specifically this includes the development of tools and software that support the integration of structured and unstructured data (i.e. Microsoft Exchange, Microsoft Sharepoint, INSITE, EMC’s Documentum, file systems, etc.). This connectivity will overtime become a key component of DecisionSpace and will provide a framework for Landmark and other vendors to seamlessly integrate structured and unstructured data.

¹¹ <http://www.w3.org/2001/sw/>.

Not exactly. OS has important role to play in platform integration. This is Landmark's own open integration environment. Say we work together on mutual data integration we can leverage an object connection to OS. By encouraging cooperation between vendors the world will be a better place than in the old days of winner takes all. Landmark is also committed to supporting OS.

Paul Haines (Knightsbridge/HP) – I was at the Gartner conference yesterday. There was talk of multiple (up to 32) tags required to tie unstructured data to structured. This is too many for most users. What does Landmark do?

Yes. Google says 'metadata is dead.' But that argument is fundamentally flawed. Google search is not intelligent enough. On the other hand, users will not supply 32 metadata tags! The status quo is not good enough. You need to generate as much metadata as you can on the fly – this gives a big head start and gets users on board, making metadata capture systems effective. We are not after a 100% solution right away.

Diz (Repsol YPF) – This is the kind of solution we are looking for but it appears to be too data centric. The way forward is to think of context and process at the same time.

A fair point.

Paul Maton – What does Schlumberger have to say in the context of vendor openness?

Abusalbi – We have been 'competing on openness.' We held an 'open fest' last year with presentations from Paradigm and Landmark with hugs and pictures and now there is an expectation of openness.

ProdML/WitsML is a good example of the spirit of cooperation.

Casey (BHP Billiton) – IHS Energy and other vendors sell data but attributes are missing. What are your plans regarding the data providers?

We provide IM services to one of world's largest seismic acquisition companies. Data we deliver will end up in one of our interpretation systems so we are keen to populate headers. But the real forum for these issues is the standards bodies. Industry needs to call data vendors to account.

[TW0702_7 The ISIS data management project¹² – Achim Kamelger, OMV](#)

With the ISIS project, OMV intends to deliver a high quality information service with knowledge management 'embedded in the business.' Today data quality, standards and policies are being implemented as a first step – a move away from 'C:\ drive data management.' In general update mechanisms are poorly supported by vendors. It is easy to generate multiple versions of the same or almost the same data. Too much time is still spent looking for data. OMV has now created a global IS organization headed by Alan Smith (on secondment from Paras).

Kamelger's concluding slide punned 'Carpe DM!'

Q&A

BP – how do you share knowledge?

Communities of Practice (COP).

Comstock – Have you managed to identify and disseminate best practices during the Petrom or other acquisitions?

ISIS was a joint effort with Petrom. One lesson learned was that putting internet into Romania can be problematical.

[TW0702_8 Upstream standards today – Jerry Hubbard, Energistics \(formerly POSC\)](#)

Hubbard unsurprisingly stressed the importance of standards. Companies need a 'freely available, universally applicable set of data exchange standards.' This will be even more important as streaming data comes into play, as data flows look more 'like a 48" pipeline.' Standards help companies manage multiple vendors and 'dis-integrated' applications. Energistics' role is to pilot and share standards development on behalf of the industry. Energistics needs to do a better job of standards deployment. Companies spend to develop standards but fail to follow up with adoption. Hubbard proposes to do this by looking at the 'intersection points' between geotechnical standards and ERP, HSE, etc... Today's standards are North American/North Sea centric. But NOC¹³s have 65% of the world's reserves and would benefit from a globalization of standards – we need to be inclusive. So Energistics is to educate, communicate and build the business case. Hubbard concluded with an enthusiastic presentation of the merits of ProdML.

Q&A

¹² Apparently joint effort with Accenture.

¹³ National Oil Companies.

Haines – Apart from the ‘Energistics’ name what else is new?

Like I said, a new focus on deployment, globalization and the Advisory Council.

Comstock¹⁴ – What of your relationship with other standards bodies and the standards ‘clearing house’ concept?

We have a reciprocal relationship with PIDX and a clear division of roles. If you want a data model, PPDM is the answer.

Roger Abel (Shell) – What is the business model?

We did the Global Well ID project in association with IHS energy. The Advisory Council arbitrates on what should be followed and funded. We only do standards that are market driven.

This can be a long drawn out process?

Yes it is slow sometimes.

Raphaelle Henri-Bailly (Total) – There is a need for sharing information regarding data quality – there is no momentum here as yet.

Yes. The well GUI project is in this space although some aspects are commercial to IHS energy.

Hydro – we are totally dependent on standards. Sorry Landmark, Schlumberger, the times are gone when you can do everything. There will always be niche applications that depend on standards. Until there is something better, I say go for WITSML/PRODML.

TW0702_9 SEG data formats update – Jill Lewis, Troika International

SEG-Y Rev 1 got little support from workstation application vendors and technology moves on. Today the SEG standards committee is studying high capacity 3592 tape which allows more than one line per tape. IBM is keen to promote SEG D 2.1 which allows this and has funded Rund Hagelund to write the new D 2.1 spec. The UKOOA Positional Standards are now moving to the UK-based International Association of Oil & Gas producers (OGP)¹⁵. Turning to data management, Lewis asked ‘Who still has data on Exabytes?’ A few raised their hands. Lewis remarked that this media was designed to last a year – so ‘get them copied quick.’ Another issue is that we still record seismic on one tape and navigation on another – and this is 2007! Contractors are against any change to SEG D. So Lewis advocated change without a re-write of the spec – for instance bringing in navigation, adding a ‘depth’ field and other ‘clever thinking’ to work around this in a SEG D 3.0 revision. Lewis advocates ‘proactive’ data management and her company, Troika is working with Kestrel on a ‘savvy’ approach to a tape library ‘refresh on the fly.’

Q&A

What about XML for seismic data?

The SEG has no real policy on XML – we are waiting for something to turn up!

Abel (Shell) – The EPSG data set on the OGP site is to be available as a web service ‘real soon now.’

Total uses Petrovision, what is Epicentre’s role in this space?

Epicentre is a POSC standard and is not under the SEG.

Maton – I’m not sure about the status of Petrovision, but the EPSG has seen a lot of ongoing development and has been taken on board by WITSML.

TW0702_10 Chairman’s address – Alan Smith, Paras

Smith explained that he is still with Paras but is currently Head of E&P IS at OMV – an ‘interim management post.’ Smith noted that there were some younger attendees in the audience – an encouraging sign in the light of the ‘big crew change.’ Smith’s straw poll asked, ‘What do people think is the biggest issue – people, process or technology?’ a majority went for people, with which Smith concurred saying, ‘We need more people, who are less resistant to change. The issues with process are less severe. Standards are good too.’

TW0702_11 Pemex’ CADI operational database – Nick Baker, Petrolink

Petrolink has been working on Pemex’ Pozza Rica Altimara (PRA) asset (offshore Veracruz) for the last 6 months. Pemex has 3.6 mm bopd production and is the 5th oil company in the world with 140,000 employees. Baker referred to Pemex’ @ditep project saying it was great, once data is loaded, but that there were problems with

¹⁴ who is on the Energistics board.

¹⁵ <http://info.ogp.org.uk/geodesy/>

remote data access and data quality. Pemex is therefore looking to enhance data QC. Problems stem from missing data, data ownership and multiple data sources (email, faxes, ...) and locations (on Windows File Server, on contractor CD and so on). Management wanted printable pdf summaries of current data. Petrolink was chosen to provide data QC and preparation for loading to @ditep. Petrolink has been rebranded and localized as 'CADI' – the 'collection center for digital information'¹⁶. Petrolink has been translated into Spanish by local consultants with industry experience. Security (SSL 2) leverages existing communications (this proved difficult with older band limited microwave systems). All data types are entered for full reporting, metadata is added in a controlled workflow and the results served all to stakeholders. Intranet and extranet access is available for home/travel and entitled third party access.

CADI runs on a Windows 2003 Server with Lotus Domino Server. QC and data load is done by Pemex personnel – promoting the idea of team data ownership. A folder structure lets managers go in and look at workflows for instance for rig scheduling, and see available executive reports, flight details, production reports, sales to refining, drilling and workovers. Online help and chat has been found to be very useful. Intranet and extranet servers synchronize with each other. Some within Pemex asked, 'Why do we need an outside contractor for this?' Baker's answer is that existing solutions didn't work. Another question was, 'We have @ditep, why do we need CADI?' In fact the complementary nature 'was soon apparent.' Problems of 'turf wars' (departments wanting to preserve their control over data flows) used to be an issue, but now 'they see the benefits.' Petrolink/CADI is run as a full service, not just a website/application. Pemex pays a monthly fee – visit www.cadilink.com/eng/index.htm.

Q&A

How many people?

Eight.

Has CADI been extended to other Pemex assets?

Yes to other assets in the region. The system will now be extended to whole Norte region.

Steve Hawtin (SIS) – How do you categorize data?

Make sure well names have a correct UWI. Ancillary data (DLIS), side wall core reports, rfts all need accurate categorizing (naming). Everything is centralized and loaded to @ditep.

How do you update your categories?

Operations groups decide on categories – geologists are responsible for geology, safety for HSE etc.

Shell – this is a big project – how did you prioritize what got done?

This was client-driven. Asset managers wanted reports, then we went to HSE, then well data with geological operations, then drilling and contracts.

Biznet Solutions – How do you acquire real time data?

We are talking about this currently. We already have a WITSML aggregator. We are participating in trials of data delivery to OpenWorks – but Pemex is also talking to other vendors.

Authentication?

There is no fancy authentication, although things may go that way. This is a mature asset – most data is not confidential.

TW0702_12 Monitoring Shell Nigeria's production - Hatem Nasr¹⁷, vMonitor

There is 'no reliable continuous production data from most of Shell Nigeria's wells,' mirroring the situation worldwide where over 95% of oil and gas production is from non monitored wells. For most fields, engineers touch the pipe to see if a well is shut in! Despite all the hype about smart wells, data from WellDynamics¹⁸ smart wells is collected by a recording truck! Today, Nigeria is in the forefront of a migration to data monitoring.

Process control specialists like Honeywell, Emerson and Invensys 'tend to focus on the downstream.' The large oil service companies, which in reality have little or no experience of process monitoring, have brought in 'big iron' control systems. Remote data acquisition is often through third party fiber optic cable – a 'very expensive solution.' For Nasr, all this is overkill – the best answer is wireless. Shell has a vast array of production monitoring tools in the office – Shell Prod Universe, FieldWare and Matrikon OPC, OSI PI Soft and vMonitor TotalAccess. And there is a lot of data at the well. The problem is in the middle.

¹⁶ Centro de Acoilo Digital de Información.

¹⁷ Nasr presented a rather similar paper at last year's [SMi conference](#).

¹⁸ Both WellDynamics and vMonitor are Shell-supported companies.

Most economic benefits come from avoiding production deferment – you don't need a neural net to do this. HSE studies show that 80% of fatalities in oil and gas are on trips to well. Nigeria is particularly sensitive in this context - operations in the Warri Swamp are challenging. Vegetation and wireless don't mix, solar panels get pinched. So vMonitor has developed small long range transmitters and data acquisition units. These capture data from pipelines, wellheads and gathering stations. Our RTU is now the size of a cigarette packet and the radio is the size of a PCMCIA card. The next step is to do control. This means that the unit can't go to sleep (as is currently the case) and will require power to be kept on in a low power mode. Next generation radios the size of a match book transmit 'a few miles'. There is now wireless on 1500 SPDC wells and this is to extend to all SPDC assets. vMonitor is currently tendering on the Algerian Hassi Messaoud supergiant.

Q&A

How come your stuff works in the jungle?

By minimizing the power to the RTU and devote this to the radio, multi hopping signals from well to well.

(Shell) Can RTUs interface to any DCS?

Yes. They communicate through a gateway/concentrator and into the DCS.

What's reliability like in the heat of the jungle?

Actually Nigeria is not as hot as Oman where it can reach 60°. Wireless helps with reliability.

Abel (Shell) – With 1500 wells you will get a huge amount of data. Is Shell Nigeria capable of handling all this?

Actually there is not a huge amount of data. A wellhead provides 6 parameters every 10 minutes. PI (the data historian) will handle this. A single well log equates to 6 months of monitoring data. They have the DM backbone to manage this.

Battery life?

The new generation of batteries can go for 2 years with dual battery packs depending on the frequency of data acquisition. 1 year to 18 months for regular battery packs.

TW0702_13 [EarthSearch environment embeds Google Earth – Katya Casey, BHP Billiton](#)

Casey traced the history of integration from one database per application (1995) to 'constellations' of applications from Schlumberger and Landmark. Even today, 'it is still hard to move stuff around.' By 2010 (maybe) we will have services from 'fit for purpose' databases. But to get there we need to tell vendors what we want and cooperate with each other. Casey confessed to being puzzled by Pemex' @ditep – as 'there is always something missing from a huge database.' Other large scale solutions like Oracle Spatial are all very well but sometimes you need to draw a quick map. BHPB are enthusiasts for Documentum. This has been used to store Eclipse models¹⁹! SAP is likewise used as a data 'hold all.' But there is still poor integration of legacy data with new solutions and a divergence between data acquisition speed and our ability to analyze it especially in the context of growing data volumes and the declining size of the workforce.

Vendors like to claim they are 'integrated.' But this can mean different things such as visual integration through a 3D canvas. For others the Portal is the answer or perhaps GIS-based integration of sparse data – which Casey described as the 'best thing that ever happened to us.' BHP Billiton's 'EarthSearch' Portal leverages Google Earth Enterprise and SOA-based middleware to query multiple vendor data stores in what Casey described as 'multi dimensional integration.' A BHPB steering committee met monthly and got involvement from new ventures, exploration, appraisal and 'execution' (planning, forecasting). BHP is a big company and has 'everything there is' from Documentum, to search etc. This project targeted the coordination of portal searches across all projects.

The solution leverages a taxonomy-driven E&P metadata layer which embeds business rules for critical information. An integrated environment uses middleware for interoperability across the whole software portfolio. BHPB is an OpenSpirit shop and is working with vendors to extend the middleware. Notwithstanding the support for OS, Casey gave a big plug for Petrosys as an alternative interoperability supplier – although BHPB 'may stay with OS.' BHPB is also trying to keep abreast of Landmark R5000 and a maturing Seabed.

BHPB's integration formula defines workflows, search tools, taxonomy and the application communication layer. Building blocks include BHP's PetroSearch (an in-house Verity-based development), GoogleEarth, ArcSDE and BHPB's taxonomy (mapped to POSC and PPDM). The choice of GoogleEarth (GE) raised some eyebrows – but 'GE works and ArcExplorer does not!' The result, BHPB's 'EarthSearch' combines PetroSearch with GE. GE knows about producing formation and more geo-related information. PetroSearch adds well information retrieved

¹⁹ A deprecated practice.

through the GWI. Why GE? It is simple to use. For more fancy mapping, go to the GIS. GE lets you blend web services stuff together. GE sits at top level (alongside SAP) and enterprise search. EarthSearch works now in Houston and is extending to London and Perth. Next BHPB plans ‘cross over’ controlled vocabularies between geotechnical and other sources.

Q&A

How hard was it to develop and deploy your taxonomy?

Not hard.

What kind of costs and support did you get from Google Earth Enterprise?

BHPB was a groundbreaking first client of GE Enterprise Service for Oil and gas²⁰. Google proved very reactive, the software demonstrates good scalability but does not come not cheap!

OS as middleware?

BHP worked with OS on a pilot. The OS/GE integration was based on this work.

TW0702_14 On SOA and upstream business intelligence – John Miller, Knightsbridge

Knightsbridge, recently acquired by HP, offers integration services leveraging tools from Cognos, Business Objects and Microsoft Excel, described as ‘the most commonly used tool for business intelligence²¹ (BI).’ Examples of upstream BI include well performance, production optimization and supply chain analysis. Modern BI leverages a services-oriented architecture (SOA) of loosely coupled composite services. SOA builds atop a BI-based data architecture embedding ‘data ownership, UIDs, metadata, master data, timeliness and completeness.’ BI data services leverage extract, transform and load²² (ETL) technology. Portals call up data via ETL. Data warehouses, operational data stores (ODS) and data marts can also be exposed as ‘integrated data services.’ As an example, a SOA-driven well review process would spot a production ‘event,’ such as a flow meter that has stopped. The real time interface sends an event to the BI system. This compares the event with historical production data to determine the course of action that needs to be taken and to prioritize well interventions. The system ‘answer lots of other questions like what happens if we don’t fix a problem.’

Q&A

BP – This sounds like another ‘silver bullet.’ What’s different with SOA?

A good question! SOA is a concept. It asks IT to retool applications as steps in the workflow. But yes, it is to a large extent ‘aspirational.’ We need to play an active role in data standards and business process modeling. We also need tools that connect applications and share attributes.

TW0702_15 Round table – David Rose²³, Wally Jacobowicz²⁴, Thierry Gregorius²⁵, Augustin Diz²⁶

Rose Aupec provides economic services to oils in particular a yearly IT benchmarking study of ERP, technical computing. Data for 2005 showed total IT spend as \$2.3bn for ‘a good sample of large oils.’ Spend per desktop is now \$20,000/ year. IT costs per bbl come in at 21-26 cents. Cost cutting is moving IT spend from opcost to

²⁰ Monday, October 02, 2006 <http://googleenterprise.blogspot.com/> **Energizing Google Earth** Posted by Noah Doyle, Enterprise Product Manager. ... A growing number of companies and government agencies have been using Google Earth's Enterprise solutions to layer their data onto the globe. Energy companies have been particularly enthusiastic in adopting Google Earth Enterprise. With huge amounts of exploration imagery and the need to manage oil rigs, pipelines, equipment etc. all over the world, the energy industry is a natural fit for Google Earth Enterprise. That is why we are pleased to announce that [Spatial Energy](#) has joined the Google Enterprise Professional program as a Google Earth Specialist. Spatial Energy has extensive experience providing imagery solutions to the oil and gas industry, so we are excited to work with them to extend the reach of Google Earth to more oil and gas companies.

²¹ The term business intelligence comes from the data mining community and in the broadest sense refers to extracting information from in house data sources. It can be considered as an alternative to the use of industry specific tools for, for example, production data reporting. In another sense, business intelligence reflects the arrival on the E&P scene of consultants like HP offering services in the space previously occupied by Schlumberger and Landmark.

²² ETL is a fancy way of describing data transfer protocols from one data environment to another.

²³ Aupec.

²⁴ Hampton Data Services.

²⁵ Shell.

²⁶ Repsol YPF.

investment. Overall, these metrics provide a ‘crude²⁷ effectiveness measure for senior management.’ Rose hopes to be able to quote similar numbers for data management in the future.

Jacobowicz described trends in DM as ‘rebalancing’ from application focus to people and process and data cleansing. The big central repository ‘went out a while ago.’ Companies don’t want to lock into a single vendor. Multi-vendor best of breed solutions can be built around a metadata environment/layer, with cleaning of data and tagging of information.

Gregorius has spent nine years with Shell as geodesist, GIS and DM specialist. Gregorius recalled his interview with Shell where a huge pile of information, 80% of it useless, had to be analyzed in an hour and a proposal formulated. These are the skills you need and the process is unlikely ever to be completely automated. Gregorius is also skeptical of ROI discussions. If a Monte Carlo simulation does not give the results you want, just fiddle the parameters – ‘take your shoe size and divide by the age of your hamster!’ Our industry will always be running behind new technologies like Google Earth. Information is chaos and always will be. Explorers like uncertainty engineers don’t – there will always be tension between creative and engineering types. Invest in staff, skill them to be more all rounders. ‘Most return on investment (ROI) calculations are a load of rubbish but if this is what rocks your boat, that’s OK.’

Diz Knowledge Management ties information flows across technical and decision making. We will soon have information flow maps. We are visual people – we need to capture ‘patterns’ and look to our psychological side.

Discussion

Alan Smith (Paras) – It is normal that IT costs should rise because of increasing automation. But the reduction in staff means that lifting costs will go down overall.

Casey – IT and cost reduction are all very well but they do not address improving field performance etc. We need to combat the negativity of IM ‘wasting money’.

ONGC – KM needs data mining tools to reduce dry holes – if not why bother?

Gregorius – Your eyes, mouth, the plane and telephone are the best KM tools.

Anon – A negative effect of Google is the fact that as youngsters are ‘geographically aware,’ they think they don’t have to learn anything any more!

Gregorius – They need exposure to field work asap!

Hydro – Operational exposure is very important. There is no tool for experience transfer. A Hydro well was saved from a blow out by a driller who sensed that something was wrong and closed the shear rams – even though this went against book. In fact the meters were installed wrongly.

Shell – Google overloads us with information but the new generation is used to overload and can handle multiple scenarios and solutions.

Shell – Applications may hinder knowledge capture.

Diz – You need to motivate operators on data entry by explaining that the data may be very useful years later.

Casey – We need to take data vendors to task collectively – in this kind of forum maybe?

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²⁷ No pun intended !