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SAP in oil & gas

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Oilfield open source?

PetroVisor from Myr:conn Solutions promises 'open source-based' knowledge automation for the oilfield. A 'hybrid' data, knowledge and machine learning toolkit leverages Microsoft HDInsight.

First unveiled in 2012 (OITJ November 2012), Austria-headquartered Myr:conn's PetroVisor, an open source, rapid application development platform for the upstream, is now ready for prime time. CEO Michael Stundner is on a mission to 'democratize' the digital oilfield with the platform that lets users build their own digital oilfield solutions, 'instead of relying exclusively on proprietary vendor products.' PetroVisor integrates with clients' service-oriented architectures and thus is claimed to avoid software product silos.

Myr:conn's own work with the platform has been on 'SAX,' a.k.a. smart automated candidate selection, using Bayesian machine learning to identify fractures in a giant oilfield, integrating multi-discipline expert knowledge, data and deterministic models spanning the whole upstream workflow. Stundner observes, 'Cross-discipline workflow integration is probably the ultimate objective for the digital oilfield and is also the hardest to achieve.' SAX epitomizes Myr:conn's 'hybrid' approach that spans data, knowledge and model-driven problem solving.

Early adopter Kostro & Friedel has used the platform in its asset performance/portfolio screening solution, leveraging PetroVisor's data integration, workflow management and analytics.

Microsoft's HDInsight cloud service enables PetroVisor to manage 'big data' projects using open source software technologies such as Apache Hadoop, Spark and R. Trusted Analytics' internet of things to Hadoop interface also ran.

The PetroVisor development platform exposes various APIs and can consume business logic described in its own P# scripts or written in the R language.

Since PetroVisor builds on a Microsoft technology stack and embeds scada data access components from CSE Icon, some will query its 'open source' claim. We asked Stundner exactly what Myr:conn means by open source. '*We split our offerings into two camps: PetroVisor enterprise (paying customers) and PetroVisor open code (free). Enterprise is certified to run on specific hardware and software and is fully supported. The open code option provides the raw PetroVisor source code under a GNU GPL 3.0 license. The code will be available for download from our website and on GitHub at a later date. Users can propose code changes and add-ons to be included in the code base. A committee will decide if these are integrated into the next release. DLLs, P# and R scripts based on published methods and technologies will also be available for download.*'

Although this may not satisfy the open source purist, the approach is well aligned with Microsoft's own blurring of the proprietary/open source boundary.

More on open source in the upstream next month.

Highlights

SAP in oil and gas
Graph Connect
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Web GIS
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3D part printing
Safety first

NEXT IN OIL IT JOURNAL, PNEC E&P DATA MANAGEMENT, HOUSTON

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Getech buys Exprodat

London-listed potential field data provider acquires GIS consultant, developer of TeamGIS and Unconventional Analyst.

Oil and gas Esri/ArcGIS specialist Exprodat Consulting has been acquired by London-listed Getech Group plc. Exprodat joins Exploration Reservoir Consultants in the Getech stable, acquired in 2015. The unit will continue to trade as Exprodat. Exprodat's management stated that its customers will benefit from an access to a broader range of services and products targeting exploration and development.

Exprodat's suite of ArcGIS-based software includes TeamGIS and Unconventional Analyst, both featured in a seminal presentation from Total last year (OITJ 2015 N°1). The company also implements GIS technology and integrates petroleum data with key business systems for clients.

Potential field specialist Getech, a spin-out of the University of Leeds was founded in 1986 and today claims the world's largest commercially available library of gravity and magnetic data. The company floated on the AIM exchange in 2005 in an IPO that valued the company at some £11 million. Getech's stock dipped 7% on the announcement.

Bruce Rodney's Denver-based Exprodat Inc. unit, a data management consultancy and developer of the IQM data quality assessment tool, was not involved in the acquisition.

Enthusiasm, shouts, rapturous applause - and this software!

Neil McNaughton reports from Neo4J's 'Graph Connect' conference in London. The graph database trades the tables of the *relational* database for a graph of, err... *relations* and claims a mathematical pedigree going back to the 18th century. Whatever. Users (the Financial Times, Pivotal and Smurf manufacturer Schleich) are enthusiastic. In fact the audience went wild when Mar Cabra of the ICIJ presented the Panama papers as a big graph of data!

It has been a while since I saw real enthusiasm at a user conference. Most upstream software is pretty mature these days and what is not mature is usually massively oversold before anyone gets to grips with what (possibly imagined) problem it sets out to solve and how (if at all) it is going to solve it. But, at the 2016 EU Graph Connect conference in London that I attended earlier this year, there was real enthusiasm both for the novel technology and, especially, for what is being used for.

Graph Connect is a shop window for Neo4J's graph database technology. If you want to know what a graph database is I invite you to consult Wikipedia and if you think it sounds like something you heard of a long time ago, you could also visit the Talk page. For the party line though, you could try the O'Reilly book. If you are familiar with the semantic web and the RDF triple store, well there is a lot of overlap with the graph database. However, if you spend too much time trying to figure out exactly what something really is in IT, by the time you have got it, the technology will have moved on, so let's just get on with the conference.

Neo4J founder and CEO Emil Eifrem puts the graph database on a mathematical pedestal that goes back to Euler's 1736 paper on the Seven Bridges of Königsberg. This proved that walking across all the bridges without retracing one's steps was impossible. OK that is not perhaps the greatest marketing pitch but Euler's work did spark off the study of 'graphs,' i.e. the relationships between things. These boil down to three core abstractions, node, relationship and property. Eifrem positons the graph model as better suited to modeling many facets of the real world than the relational database. Neo4J's graph database is used by companies including Cisco, Wal-Mart and LinkedIn*.

Andreas Weber presented on the use of Neo4J in product data management at German toy manufacturer data **Schleich** (famous for its blue-skinned 'Smurfs'). The company operates worldwide and has to deal with many legal and regulatory environments covering its products and chemicals. Currently the information is scattered across different relational databases, SAP/ERP and many documents and spec sheets often with local context. Neo4J allows investigation across product, model, bill of materials, substance and DIN specs of components. Engineers' queries now involve finding the right path through the graph. Weber observed that the bottom-up graph approach is better than doing this with a metadata layer.

The graph talk got a bit closer to the oil and gas vertical with a presentation from James Weaver of **Pivotal**, whose Cloud Foundry underpins GE's Predix. Weaver presented his work on Pivotal's Concept Map a free online tool for 'navigating all the knowledge.' I played with the tool, pinning 'hydrocarbon' and 'methane' into the GUI and clicked on 'relationship' to reveal that these items are linked through the 'Armenian Soviet Encyclopedia' which is pretty weird. I'm not sure if the Concept Map is revolutionary or anecdotal but it is powered by Spring, runs on GrapheneDB, a hosted edition of Neo4J, and blends structured relationships in Wikidata with article text in Wikipedia.

Dan Murphy showed how the **Financial Times** has used Neo4J, along with Google's Go programming language to build a 'semantic linked data platform.' The project involved a shift away from a monolithic website, heavy on XML that was deemed unfit for the FT's nimble future. Following unsuccessful trials with HAL and an RDF triple store Murphy decide to Neo4J and Go (with the Neoism Go library). The system now works as advertised and links allows FT journos to track companies and individuals through to subsidiaries and other articles. For performance, the code needs a lot of tweaking, 'just like SQL.'

IBM was also in on the graph act. Ivan Portilla presented a curious combo of IBM Watson and Neo4J. The result, WayBlazer is a toolkit for developers of travel websites, notably the very naff 'Connie,' Hilton's robot concierge.

Axel Morgner from **Structr** observed that in many organizations, Excel is used as shadow IT solution. Various approaches have been tried to break the Excel stranglehold, MDM, ESB and middleware. But it is better to create a unified central system offering tight integration of all data sources and a unified data model. For systems you cannot replace, like SAP, their scope needs to be constrained, 'SAP is not the best place for all enterprise data.' SAP at Schleich is 'very slim in scope.' Structr's graph application development platform consumes RDF, ER, XML and Sparql to create a unified central data model.

And then there was Mar Cabra, an ebullient journalist from the **International consortium of investigative journalists**, with the IT background to the unravelling of the Panama papers. Neo4J, along with Linkurious and Talend were used to analyze the 2.6 terabyes of data that a Fonseca mole had kindly supplied. Over 500 western banks were found to be acting as intermediaries to Fonseca. Cabra pointedly observed that 'there are lots of banks here.' The bankers seemed unfazed. In fact the audience was in raptures with this potent blend of politics and geekiness. The rapture turned to delirium when Cabra announced that all of the Fonseca data would be made available to the public. Go see if you are on the list!

** To (perhaps) state the obvious, 'used by' does not mean that the technology is in exclusive or even widespread use at any of these companies.*

@neilmcn

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Oil IT Journal interview - Indy Chakrabarti, Paradigm

Paradigm Senior VP tells Oil IT Journal about working in the downturn and the revamped collaboration with Dassault Systèmes on linking geological and mechanical modeling. He also explains how data compression is helping the interpreter, with help from Hue CEO Diderich Buch.

How is Paradigm doing in the downturn?

Well it is no longer business as usual! But we are keeping busy as witnessed by our deals with GE, Dassault and Hue. With Dassault, we are targeting what we call 'reservoir-driven production risk management,' adding geomechanical modeling to our portfolio with Dassault's Abacus. This has been coupled with our Skua modeling flagship. Re-frac workflows are a current industry preoccupation and the Skua/Abacus combo lets you see fractures propagate in the vicinity of the well bore after an initial frac.

We didn't know that Skua could do fine grained well bore modeling.

It is first and foremost a reservoir-scale modeler but its grid refinement capability can be used to study fault reactivation as producing fluids lubricate fault planes in the vicinity of a well. Such phenomena can damage the well bore or open up zones of lost production.

Are there anchor clients or sponsors of this work?

The project has only just kicked off. We are in discussion with potential clients but this is our own development, not a consortium. Also this is not packaged software, rather a software and services bundle. We also couple the macro-scale reservoir model to Abaqus for full field geomechanics for well placement and drill planning.

Doesn't Geolog do geomechanics?

Yes, it always has had geomechanical functionality and we have built significantly in the last release with more work on image logs for fracture detection. A full workflow would be from Geolog to Skua for building the reservoir model and for data exchange with Abaqus.

Tell us more about the deal with Hue.

Data compression saves on disk space and raises interpreter productivity as less time is spent waiting for data while roaming through a seismic cube. But geophysicists don't want to sacrifice resolution. We have checked Hue's technology and determined that at 3-4x data compression there is no discernable loss in resolution at all, out to six decimal places. For quick-look or QC we can even go to 30-40x. Actually, conventional interpretation systems often use brute force compression that truncates 64 bit data to 32 or even 16 bits. Now that does affect resolution!

Which products use the compression?

All the Epos-based seismic products including Skua and Seis Earth.

It used to be thought that seismics was not compressible!*

There have been attempts over the years but most were too aggressive and lossy. Hue lets you do accurate work at 3-4x.

Things might be different with pre-stack data as imperceptible details may stack into signal…

That's what we are working on now, using Hue's technology on pre stack data.

~

Additional input from Hue CEO Diderich Buch.

Paradigm is the first of the big providers of seismic-oriented geoscience applications to adopt our technology. Today, storage and network performance lags behind acquisition and computation. There may be cases where lossless compression is needed but most seismic usage clearly does not. Minor losses due to compression don't affect phase, frequency or amplitude for imaging and quantitative interpretation. Several oil companies and seismic/software vendors have arrived at the same conclusion, and it's safe to assume that processing shops and oil companies will also adopt our technology. This saves on average 80% on disk space, maximizes interpreter productivity, optimizes your networks and makes sure your CPUs are continuously fed with data.

Our next target will be the national data repositories which currently only store stacks, not the gathers. NDRs could provide a significantly more valuable service if the gathers were available and more data was available live. Turn-around time for re-processing and interpretation would also improve significantly.

** OITJ December 1996.*

Web-GIS forces rethink of IT strategy

Exprodat MD blogs in praise of web GIS, sees writing on the wall for big internal IT departments.

Exprodat MD Gareth Smith, invigorated by attendance at the Esri business partner conference, has been blogging on all four cylinders in praise of web GIS, suggesting that the IT department is now 'optional!'

Smith observes that before the current 'deepest of downturns,' web GIS was only considered 'nice to have.' GIS developed piecemeal, first on the desktop in a single department, later on the server perhaps with a few web maps to broaden access. There was rarely a clearly defined strategic vision, in fact, 'cloud-based GIS was viewed with suspicion, or was simply a non-starter due to IT policies.' Just as the web GIS platform model was maturing, the oil and gas spending cuts hit.

Smith now foresees a complete reappraisal of IT strategy, 'the days of large onsite IT departments and infrastructure are numbered.' They are being replaced with cloud computing which has 'come a long way in the last few years in terms of price, performance and security.' Even before the downturn, consumer cloud services were ubiquitous. In industry though, the paradigm shift was hampered by 'in-house IT that was no longer an enabler, it was a handbrake.' Esri's release cycles were getting ahead of IT. Today it's even harder to see oil and gas companies keeping up with three month releases.

The message from the conference was clear, cloud-based web GIS should be at the core of your strategy, either with ArcGIS Online hosted by Esri, as an on-premise portal or in a roll-your-own deployment on Amazon.

Blueback Seismic Data Management

'Open' data management system has hooks to Spotfire and PowerBI.

Cegal has announced Blueback Seismic Data Management, a corporate information management solution for seismic data. The stand-alone solution promises 'full life cycle' management of seismic data and includes functionality for scanning, de-duplicating and cataloging data on disk, performing quality control and data preparation and workstation loading of 'increasingly complex' seismic data sets. Blueback SDM runs on Windows through a web based user interface. The solution integrates with GIS systems to provide map and table based views of seismic assets.

The 'open and easy to use' data model provided in the Blueback SDM database can be accessed directly with third party tools like Tibco/Spotfire, Microsoft Power BI and Excel to produce custom reporting and dashboards. Spatial information can be accessed directly from ESRI ArcGIS for integration into GIS workflows and external maps. Cegal is also working on plug-ins for Schlumberger's Petrel and Studio.

Startups target oil country big data

CGG spins-out Agile Data Decisions. Ex-Schlumberger CEO-backs Kayrros' ML for energy markets.

CGG has spun-out the machine learning-based upstream data QC technology unveiled at last years' ECIM conference (OITJ 2015 N°8) into startup, **Agile Data Decisions**. AgileDD is to further develop and commercialize the iQC 'big data' application for upstream database population. Under the hood is a combination of MapReduce, decision trees, latent semantic analysis and clustering. The technology is delivered via a service model with customers 'only paying for the extracted information.' The system works across structured and unstructured information and provides an audit trail of data provenance.

CGG is to be AgileDD's first customer and reseller. The startup is also looking for new investors with an initial $0.5 million target. A Safe* mechanism is offered to early investors whereby they receive a bonus upon shares creation.

~

As the Financial Times revealed, ex-Schlumberger CEO Andrew Gould is backing another oil country big data-cum-machine learning startup **Kayrros**. The company is to offer 'disruptive analytics for energy markets' promising 'unseen transparency' (*sic*) to traders. Kayrros blends satellite imagery, social news with large scale financial and technical data. Kayrros' has assembled an illustrious team for whom its $1.2 million seed funding must be chump change!

* *Simple agreement for equity*.

Fugro, Ikon team on drilling geohazard prediction

Site survey expertise combines with seismically-derived geopressure analysis.

Fugro Geoconsulting and Ikon Science are teaming on a wellsite geohazard prediction service that combines Fugro's expertise in site survey with Ikon's seismically-derived geopressure analysis. Geohazards such as shallow gas pockets are a danger to drillers around the world. While they can be identified from seismic amplitude data, their evaluation is frequently compromised by a lack of log data.

The new service leverages Ikon's quantitative geopressure analytics alongside integrated workflows from Fugro's geoscientists, including reconciliation of petrophysically-interpreted logs with seismic amplitudes and pressure interpretation. These are used to produce a 'continuous unbroken set of pressure profiles from the sea bed to total depth.' The combined approach to pre-drilling wellsite analysis is claimed to provide a more complete and accurate evaluation of pore pressure in the shallow section. Feedback of Ikon's findings to Fugro will allow refinement and enhancement of the geohazard interpretation and aid in the identification of shallow faults that could cause dangerous overpressured sands.

Total claims top spot for Pangea supercomputer

Upgrade hikes compute bandwidth to whopping 6.7 petaflops and N° 1 industry slot in Top500.

A recent upgrade to Total's 'Pangea' Pau, France-based supercomputer supplied by SGI (OITJ April 2015) sees its compute power rise from 2.3 to 6.7 petaflops. Storage capacity has also been increased, to 26 petabytes. According to the latest TOP500 chart of supercomputers world-wide, Pangea is now the fastest computer in the industry and ranks among the top 10 most powerful computers, public or private, worldwide in the TOP500 ranking*.

Arnaud Breuillac, president of Total Exploration & Production said, 'We tripled Pangea's computing power in just two years. In the era of big data, state-of-the-art, data-intensive computing brings us a competitive advantage. This power will help us to improve our performance and to reduce our costs.'

The system is principally used to support 'next-generation' seismic algorithms developed by Total's researchers, used to image complex regions and to produce numerical simulations of fields, including 4D, time lapse seismics. Pangea requires 4.5 MW of power, and is used to heat Total's offices in winter.

** The TOP500 list does not claim exhaustiveness. At last year's Digital Energy event in Houston, Schlumberger reported an aggregate 26 petaflops of compute capacity in Houston.*

Software, hardware short takes

CGG, Paradigm, BIW, AspenTech, Dynamic Graphics, Exprodat, LMKR, Landmark, Simpleinfoapps, Braeden, Barco, PVI, EnergyIQ, SkyBitz, Petrosys, Quorum, Atos, Aveva, NOV.

The 9.5 release of **CGG**'s VelPro 9.5 offers enhanced integration with the Geo-Software portfolio.

Paradigm has added support for Skua-GoCad to its app exchange program. Customers can create custom workflows, submit and download apps for free.

ITT's **BIW Connector Systems** unit has accounted a seven-pin electrical wellhead outlet for downhole monitoring of conventional and steam flood wells.

AspenTech's AspenOne V9 includes DMC3 Builder, an integrated platform with a new ribbon interface used to build, deploy and maintain all flavors of AspenTech's APC controllers.

Dynamic Graphics' CoViz 4D 8.0 'breaks new ground' in the visualization and analysis of very large cellular grids.

A new release (V233) of **Exprodat**'s Exploration Analyst extension to Esri ArcGIS enhances common risk segment mapping, pool size analysis and estimating yet-to-find resources.

The 2016.1 release of **LMKR**'s Gverse WebSteering, an add-on for its GeoGraphix flagship, supports on-the-fly data exchange with Landmark's SmartStrat.

Landmark has released the Engineer's Desktop 5000.14, a 'major upgrade' of the well construction suite. The new EDT adds a CasingWear module and updates WellCat, StressCheck, Compass, OpenWells and WellPlan. A new 'output-driven-input' methodology simplifies use.

Startup **Simpleinfoapps** has announced the 'community edition' of its Oil and Gas Data Manager, a free implementation of the PPDM association's data model.

Braeden Engineering and Consulting has rolled-out its new DCS-1200 digital charting system to replace the conventional paper chart recorders used in oil and gas and other industries.

Barco's new solid-state laser-phosphor projector, the F90 offers 13,000 lumens and 4K UHD resolution for applications in simulation domes.

Pegasus Vertex has released CleanMax+, a version of its wellbore cleanup package tuned to deepwater operations.

EnergyIQ's new event management platform IQExchange (formerly ActiveExchange) provides access to real-time events across the well lifecycle, optimizing asset management.

SkyBitz has announced the Galaxy GTP4050, a two-way global satellite communication and IECEx/ATEX Zone 0 certified tracking device.

Petrosys V17.7 enhances mapping workflows with better usability, performance, automation, direct data access and more third-party connectivity.

Quorum has announced Microsoft Excel and Outlook add-ins for users of its myQuorum 'persona-based' pipeline management system.

Atos has announced a big data-ready appliance, the Data lake and analytics factory from its **Bullion** unit.

Aveva's Engage engineering decision support tool now runs on the Microsoft Surface Hub, offering UHD visualization of 3D facility models.

National Oilwell Varco wellbore technologies has launched a power sections mobile application, available from the Apple App Store and on Google Play. The app generates standard and custom spec sheets for NOV's downhole motors.

Pole Avenia's Big data in geosciences conference

Total's HPC-based ParaView. IFPen/Teradata, MapReduce in seismic inversion. CGG's open source big geodata analytics. Ikats time series toolkit. Krakatoa deep learning for North Sea drillers.

Pole Avenia is geoscience-focused R&D incubator based in Pau, France. Speaking at a its conference on big data in geosciences*, Bruno Conche presented **Total**'s large scale data visualization engine, ParaView. PV has been implemented on Total's Pangea supercomputer (page 4) and leverages spatial domain decomposition and parallel rendering on the server. The technique applies to visualization of both large seismic data cubes, giga-scale reservoir models and point cloud data.

Total is experimenting with compression technology from Hue (page 3), and on technology options from Nvidia (Index) and Intel (OSPray). 'Google Map-like' multi-scale gigagrid visualization has been co-developed with INT and Norway's CMR Institute. NoMachine's free remote desktop is also being used for desktop cloud visualization. A new paradigm is evolving of in-situ data viewing of data during processing, enabling QC and interaction without waiting for the final result. Here PV performs real time coprocessing inside the simulator.

IFPen researcher Hery Rakotoarisoa outlined work carried out in collaboration with Teradata on the application of MapReduce to seismic inversion. A Teradata Aster virtual machine demonstrated that MapReduce enables an in-database approach to the inversion of large seismic cubes.

CGG's Guillaume Poulain also reported on the use of MapReduce in big geodata that benefits from its implicit parallelism. The open source Hadoop ecosystem is fault tolerant and capable of processing very large data volumes. MapReduce represents the 'democratization of distributed calculation.'

Researchers from **LIG**, the Grenoble based IT research establishment, presented Ikats, an 'innovative toolkit for analyzing time series.' The system has been used to analyze a terabyte or so, nine months of flight data from four Airbus aircraft. R and Python code running on a single PC and using a subset of the data enabled Pearson correlation of multiple flight parameters.

Antoine Veillard introduced **Krakatoa**, his deep learning system for oil. Krakatoa has been used to investigate borehole quality and to 'de-silo' drilling and wireline data in a North Sea dataset, establishing machine learning-derived relationships between bad borehole caliper measurements and drilling parameters.

** Read the presentations here (mostly in French).*

SAP in Oil & Gas 2016, The Hague

SAP on 'powering the digital transformation.' SAP's *social* network for energy. Accenture on OT/IT integration. SAP customer advisory council. SAP's *digital* energy network. Shell's next generation WRFM. Bluefin on Culzean. Exxon's Hana trials. BP's Hana data 'puddles.' Utopia MDM for Shell.

The EU SAP in Oil and Gas conference*, held in The Hague earlier this year kicked off with a magnificent entertainment from Steve Barnett, **The Silent Conductor** who, without saying a word, had the 1000 attendees playing a plastic pipe symphony in under 10 minutes. Great stuff. **SAP**'s Peter Maier, in his keynote, 'Powering the Digital Energy Transformation,' observed that the oil market will be living with price uncertainty for a while. Meanwhile the digital transformation, driven by big data, real time, internet of things, is happening now. Industry boundaries are blurring as oil and gas blends into automotive, chemicals, utilities and even retail. SAP is positioned at the digital core of the shift with S4/Hana, and with its role in collaboration networks such as Concur, Ariba and Fieldglass.

In the IoT context, SAP's collaboration with OSIsoft got a plug. As did the 3000 startups working on Hana cloud solutions. One example is automated billing around a machine breakdown, a process that has been 're-imagined' such that the machine talks to the cloud and orders spare parts and rustles-up maintenance personnel. 'This is not science fiction, it is already supported by SAP.' There ensued a demo of SAP's asset intelligence network, a 'Facebook for assets.' This monitors, say, a pump room, holds the spare parts lists from the OEM, and checks pump flow and power use. Predictive analytics are run to anticipate failure. Such intelligence can be used to track machine health, to benchmark equipment and to manage inventory.

Engen's Peter de Plooy endorsed the digital transformation meme as key to reducing costs. Digital is driving competitiveness and those that are not on board will not survive. It is no longer 'business as usual,' there is disruption and oil and gas will not be exempt. We need strategies to harness the power of analytics. Hana is valuable to us in a real time context. **SAP**'s Maher Chebbo elaborated on the social network for energy theme mentioning an ongoing project for a pan-EU 'iTune-like' platform for power distribution companies offering packaged, app-like services that are quick to deploy.

Mark Woolley (**Accenture**) described OSIsoft PI and SAP Hana integration. Oil and gas is used to big data from scada systems but what is new is the expansion of its usage footprint from operations to the information technology space. This OT/IT convergence is plugging the historical gap between the field and the enterprise. In the field a wide variety of acquisition systems are deployed, operating at different sampling rates and formats. Here data management is problematic, but largely solved with PI.

But there remains a big barrier, the 'air gap,' between OT and the enterprise applications for maintenance, finances and trading. The gap is effectively plugged with the SAP Hana to IoT connector for OSIsoft. Wooley outlined a deployment for a global US operator with worldwide operations with diverse assets and a 'massive' airgap between the field and back office. The operator wanted to better leverage its hardware/software skills and its Hana investment. Current operational data was inconsistent, duplicated, unreliable and un-timely (it took two days to get data into the office) limiting forecasting capabilities. The solution saw PI deployed as a consolidator for data from Cygnet, Honeywell and Kepware field systems with the PI connector for SAP removing the integration problems. Rapid configuration across data assets was enabled with the PI Asset Framework and Hana smart data access. Data can now be visualized in SAP Business Objects Lumira and SharePoint Web Parts. The operator now has a better understanding of deferment, now mitigated by standardized workflows and management by exception. A Hadoop data lake has also been deployed to store legacy data. Microsoft's Revolution-R analytics also ran. Specific use cases include beam pump optimization, that now spans technical field performance and financial considerations like, is it worth shutting in to fix? The project, a 'leap of faith' for the customer took 25 weeks from inception to roll out.

Glen Endress (**ConocoPhillips**) introduced the SAP oil and gas global advisory council which he also chairs. The GAC partnership between SAP and industry is a 'great opportunity to find out what partners and suppliers are doing to weather the storm.' The GAC, run inside SAP's JAM social media, is also where SAP learns about the industry and finds out what to provide. Some 20 plus companies meet twice yearly and initiate sponsor communities and workstreams. The GAC's deliberations to date have informed the 2016 SAP Value Map.

SAP is aiming high with its Digital energy network as explained by Ken Evans. The DEN builds on digital trends of hyper connectivity, supercomputing and the cloud and represents 'huge opportunities for business processes and business models.' The DEN spans oilfields, assets, logistics, workforce and projects, going beyond oil and gas to embrace 'diversity,' for example offshore wind. A short demo revealed a nifty map interface showing tank levels, who has what and where, and allowing for wheeling and dealing by traders.

Janette Beinart described **Shell**'s long term commitment to SAP including its downstream transformation to a single SAP instance. SAP is now a key part of Shell's digital ecosystem. Likewise Amazon web services is important in Shell's drive to be nimble. SAP has people embedded in Shell working on innovation, value extraction and on running better. Shell now co-innovates with SAP, notably on its wells reservoir and facilities management system (Wrfm), now deployed in Qatar and Norway. Shell also has a well data warehouse running on Hana. Shell had made a big investment in Hana and is looking to extract more value from this in the low oil price environment.

Shell's current IT landscape is 'complex,' Shell's own code is very expensive to maintain and the company is look for alternatives. Today 80% of the effort goes into data and systems. Shell is determined to get more from its existing data resource and is working on a next generation edition of the Wrfm toolkit based on Hana. Also in development is a global production dashboard that exposes all Shell's worldwide assets. Downstream, digital supports large scale turn arounds. One project in Qatar saw 5,000 new workers on site, again with Hana in the picture. Also of note is Shell's 'EA4U,' enterprise architecture for un-conventionals, a massive data warehouse.

Samantha Hollingsworth described **Bluefin**

Solutions' work on Maersk Oil's North Sea Culzean development. Here SAP (formerly Business Objects) business planning and consolidation BPC application has proved a good fit with capex projects. The BPC/Excel interface has encouraged take up by engineers and the tool offers tight integration with the SAP ECC stack adding 'powerful analytics and process-led workflows.' Bluefin Solutions adds a template to manage capex projects that mitigates 'pain points' in the standard SAP cost management solution. The Bluefin template builds on SAP ERP plus Primavera. On Culzean, a solution was conceived and delivered in three months. The project's agile (non waterfall) development was a challenge to IT but has proved successful. The system has retained the Excel-based interface but loses Excel 'data management.' In the Q&A, Hollingsworth revealed that the template was retrofitted into Maersk's existing (non Hana) SAP.

Moving to a next generation financials suite in a company as large as **ExxonMobil** is a major, long term proposition. Dave Drever outlined the first steps currently underway on the path to ExxonMobil's 'systems of the future.' Exxon is not exclusively SAP, it does use other financial tools but has currently two SAP instances and is looking to add Hana, co-innovating with SAP on a universal journal concept. Exxon plans to rebuild its ERP on Hana and is figuring how to deploy S4/Hana in a non-disruptive manner. Early results with the Hana database are promising with better analytics, a 10 day close, simplified data structures and a single source of truth. Some 30 processes running on the ECC6 showed a 10-20x speedup on the Hana testbed. The Fiori GUI is being trialed on mobile devices. Otherwise Exxon is waiting for IS-Oil to be completely Hana-compatible before adopting.

Drever's division is fine tuning the change management required for the real migration and is working on a roadmap for switching on the (interesting) new functionality. Exxon is striking a balance between co-innovating with SAP on functions that it requires and looking at how it does things, with a view to tweaking some processes to fit the software. Following a 2015 proof of concept, Exxon has set up a global team for further evaluation with interviews and stakeholder discussion. Not all feedback has been positive! There are two more proofs of concept underway, one to figure out the medium term benefits of S4/Hana and another to run on the upstream and test joint venture functionality. Exxon is also evaluating the possible replacement of other non SAP tools currently in use.

Richard Evans described the problems of performing analytics across **BP**'s multiple downstream SAP instances. In general, there is one instance per business unit, but some units have several. Head office analysts want to analyze across the entire estate and ask ad-hoc questions. BP leadership has demanded a group-wide focus on data and monitoring operations. Quarterly cycles are no good and cutting and pasting into Excel leads to mismatches and missing data. A new approach was adopted in 2015 with input from BP's global process community and from SAP. This involved a relatively straightforward solution, SLT plug-ins to existing SAP instances, connecting them to a cloud hosted, non mission-critical Hana environment. The solution provides near real time replication and self service tools for users to 'evolve thinking.' Not so much a data lake as targeted data 'puddles.'

Again, an agile/scrum development delivered first results in eight weeks. An agile service line means that new datasets can be pulled in as required. Evans was not at liberty to divulge what sort of queries BP is running, but the expected benefits are in the 'tens of millions.' Now, if a new query comes in, a data puddle is extracted. Once the query is answered, the puddle dries up. This allows BP to keep a handle on the size of its Hana environment. Folks may say 'It would be nice to have a year of data.' Evans says, 'No, if you want last year's number, write it down!'

From the IT perspective, the cloud infrastructure was built on AWS in hours not days or weeks. AWS was cheap ($100 for the first couple of weeks) and performant, with 1.5 billion records extracted in the initial load. Early on the pipework to AWS was not wide enough but even so, no records were dropped and there is no observable impact on operational ERPs. BP now has an established analytics platform that experts can call on *sans* local rules or regional fudges. 'Hana has reduced the effort and complexity in gathering data and will allow analytics to be carried out on a single source of the truth.'

Back to **Shell** to hear Frank Udo on the thorny topic of equipment information handover from engineering to operations. Shell needed to reduce the time spend finding, validating and updating some 800,000 work orders for plant modifications per year, an $8bn value. Handover requires an integral view of asset information, for instance, for a pump, work orders, drawings and more. The idea, as often presented, is to key in a part number and retrieve the information, yet in the real world, such functionality has proved elusive! Shell has embarked on a strategic drive to data centric engineering solutions with a portal for operations. Udo digressed to say that his plumber already has this kind of information on his tablet! To bring its engineers up to the speed of Udo's plumber, Shell is has done a deal with enterprise master data management specialist Utopia.

Mike Jordan outlined **Utopia**'s MDM solution for SAP. The challenge stems from multiple systems of record in asset intensive industries. Plant maintenance, engineering, GIS, ECM, EAM need to be in sync with as-built reality. Systems then need constant fixes and updates across handover, through turnarounds and the whole asset lifecycle. Some information is data centric, some document centric. A pump has manifestations in maintenance, in P&ID diagrams and in engineering systems. Jordan gave a plug for SAP's free value engineering services in developing a business case. Utopia builds on SAP MDG for EAM, OpenText xECM, SAP Visual Enterprise and more 3rd party stuff. Raw data is moved into a staging area where it is filtered, cleansed and loaded to the MRO operating environment, built with the same tools as above. Now if a P&ID changes, this is propagated across the system of systems. The solution is work in progress and is due for release in Q3 2016.

On the topic of standards for engineering data exchange, a field where Shell has made an enormous effort in the past, it appears that the standards ardor has cooled. Data-centric standards make handover complicated. The current approach is to 'standardize' on a number of engineering tools. If a contractor can't provide data in a particular format, then a standard tool is mandated. There is a balance to be found, and having hundreds of design systems is to be avoided. But today, handover is just not working! Utopia's SAP EAM Workbench was championed by Shell and will likely figure in the SAP price list at a future date.

The SAP in oil and gas conference was co-hosted with TA Cook. Visit the conference home page.

Folks, facts, orgs ...

Arkadin, Barco, BDO Consulting, Bell Geospace, Baker Hughes, Cheniere Energy, Energy Industries Council, Chevron, Energistics, Energy Navigator, Expro, Honeywell, Katalyst, Ikon Science, Industry Technology Facilitator, Locus Technologies, NETL, Neuralog, NIST, OGSC, IOGP, Petrofac, Regatta Solutions, Ryder Scott, Siemens.

NTT telecoms unit **Arkadin** has appointed Jean-Pierre Dacher as CTO. He hails from Murex.

In anticipation of CEO Eric Van Zele's retirement later this year, the **Barco** board has named Jan De Witte CEO-designate. De Witte was formerly with GE.

BDO Consulting has appointed energy industry veteran Bob Broxson as MD of its dispute advisory practice in Houston.

Gravity gradiometry specialist **Bell Geospace** has appointed Richard Alan Morgan as senior geoscientist. Morgan hails from Chevron.

Baker Hughes has named Belgacem Chariag as president of its reorganized global operations unit. Art Soucy is president, products and technology. Derek Mathieson is chief commercial officer of a new commercial strategy organization. Richard Williams is senior advisor to the executive leadership team.

Cheniere Energy has appointed Jack Fusco as president and CEO. He was previously with Calpine.

The UK-based **Energy Industries Council** has appointed Stuart Broadley as its new CEO. He hails from Hoerbiger.

Chevron Energy Technology Company CIO Ray Smelley has been appointed to the **Energistics** board of directors.

Rod Sidle is now industry advisor for reserves management at **Energy Navigator**. Sidle was previously with Shell, Occidental and Sheridan Production Co. EN has also appointed Bill Agee as VP US Operations and Lynn Babec and Kerry Befus as senior account managers.

Expro has hired Mike Jardon as CEO. He succeeds Charles Woodburn.

Andrew Hird has been named VP and general manager of **Honeywell**'s new digital transformation unit. Hird is a 12 year Honeywell veteran.

Guy Holmes heads-up **Katalyst**'s new iGlass datacenter in Perth, Australia.

Ikon Science has appointed Julio Gomez to VP global sales. CTO Denis Saussus has been appointed to the Ikon board. David Flett is now president of middle east and central Asia.

The Industry Technology Facilitator has appointed Richard Luff to its board as a non-executive director. He hails from Worley Parson.

Sarah Wright is now director, customer success at environmental information management software provider **Locus Technologies**.

Chunshan Song, director of Penn State's energy institute is director of the US NETL University coalition for fossil energy research. Sydni Credle is project officer and Madhava Syamlal is technical director. The new coalition has some $40 million startup funding.

Helga Stein Sheller is regional sales manager at **Neuralog**. She hails from Paradigm.

The **US National Institute of Standards and Technology** has appointed Chris Boyer as chair of its information security and privacy advisory board.

The **Chinese Geological Survey** has established the Oil and Gas Survey Center, a nonprofit organization that focuses on basic research on nationwide oil and gas resources assessment, and improving oil and gas exploration technology.

Olaf Martins has been seconded from ExxonMobil to act as the new global engagement manager at the **IOGP**.

Andrea Abt and George Pierson have joined **Petrofac** as non-executive directors. Abt hails from Siemens, Pierson from Parsons Brinckerhoff.

Logan Allen is now oil and gas practice principal with **Regatta Solutions**.

Amara Okafor has joined **Ryder Scott** as a senior PE. She hails from Marathon.

Clarissa Haller is head of communications at **Siemens**.

Done deals

Civica, IPL, CMG, Intergraph, HostSure, Legacy Measurement, Wedge, Mitsui, OSIsoft, Neos, CGG, Oracle, Textura, Reliance, Edge, FMC, Vela, Tecplot, Wood Group, Enterprise Engineering.

Civica has acquired data management boutique **IPL**, sometime data strategy advisors to BP and Statoil inter alia. Both are UK based.

CMG has received approval from the Toronto stock exchange for the purchase and cancellation of up to 10% of its public share capital.

Hexagon unit **Intergraph** has acquired Ireland-based cloud services provider **HostSure**, adding to its SmartPlant cloud offering.

White Deer Energy private equity unit **Legacy Measurement Solutions** has acquired Tyler, Texas-based **Wedge Energy Services**.

Mitsui has taken an equity stake in PI System developer **OSIsoft**. Mitsui will support PI System expansion through its global network of affiliates and is planning new internet of things solutions and digital transformation initiatives leveraging PI.

Neos has acquired **CGG**'s multi-physics business, its Italian geophysics unit and data libraries for an undisclosed sum.

Oracle has bought **Textura**, adding its construction contracts and payment management to the Oracle engineering and construction industry cloud

Reliance Oilfield Services, with help from Dallas-based private equity firm **Edge Natural Resources**, is to acquire **FMC Technologies**' North American wireline assets.

Constellation Software unit Toronto-based **Vela Software** has acquired **Tecplot**, provider of visual data analysis software for engineers and scientists in the aerospace and oil and gas verticals.

Wood Group has acquired the business and assets of **Enterprise Engineering Services**' Aberdeen fabrication and manufacturing business from the receiver. The deal adds to Wood Group's asset integrity management capabilities.

Safety first

IOGP safety reports. MiX' Journey Management. Energy Institute process safety. Rand on regulation. Seagull e-learning for explosive atmosphere workers. Halliburton's Dash subsea safety system.

The 2015 reports on worldwide oil and gas safety performance from the **International association of oil and gas producers** show fatal accidents increased 41%, up from 45 in 2014 to 54 in 2015. Download this and other reports from the IOGP.

MiX Telematics has released an 'ELD-ready' solution for the US oil and gas industry. The new 'electronic logging devices' mandate from the Federal motor carrier safety administration requires commercial drivers to track their record of duty electronically, using compliant devices. Paper logbooks are out. MiX Fleet Manager can be deployed alongside MiX Journey Management, a new solution for oil and gas fleet operators.

The **Energy Institute** (EI) has released five new publications relating to process safety management. The guidelines, free downloads from the EI, build on the EI's process safety management framework and provide guidance on management of change, emergency preparedness, device management and incident investigation.

A **Rand Corp**. economic analysis of draft Californian regulations targeting refinery worker and public safety in nearby communities has found, 'substantial economic and social benefit in preventing costly refinery incidents.' The update came in the wake of the August 2012 Chevron facility incident in Richmond, California.

Seagull Oil & Gas has announced 'cost efficient and comprehensive' e-learning training packages for offshore personnel working in explosive atmospheres. Building on IEC standards, the series covers basic understanding, installation inspection and maintenance.

Halliburton has announced the release of its Dash 3" subsea safety system, a complete solution for electrohydraulic control of Halliburton's subsea safety tree. Dash integrates with Halliburton's RezConnect solution, minimizing well test risks and reducing rig time.

Cadenas Part Solutions for AW-Lake's valve catalog

Flow meter manufacturer's customers configure their own 3D PDF product sheets.

Cadenas part solutions, a provider of 3D part catalog management and sales configuration solutions has developed a bespoke, online catalog of configurable 3D CAD models for flow meter manufacturer AW-Lake. CPS' parts libraries allow design teams to find, reuse, and control standard and bespoke equipment parts. For manufacturers, CPS develops 3D catalogs with digital CAD download technology such that components are 'designed in' to products.

AW-Lake customers can now configure their own products, 'simplifying and expediting' the selection process and freeing-up internal engineering resources. The system also delivers dynamically generated part numbers and 3D PDF data sheets of configured products. CPS president Rob Zesch said, 'Dynamically configured part numbers and 3D PDF data sheets make it easier for procurement agents to select and order, or re-order, the right part.'

MOL's machine learning in the cloud

PI System, SAP, lab data 'refined' with Cortana intelligence suite.

Speaking at the 2016 OSIsoft users conference, Tibor Komróczki showed how MOL is using the PI System in predictive refinery maintenance. MOL is aiming for 'no unplanned downtime' by integrating data from PI AF, PI EF and SAP PM via a new 'integrator for business analytics.'

Use cases include pressure swing absorbers, chillers and heat exchangers. Data from the refinery's Lims, PI Server, Opralog's E-logbook and the refinery's 'Nice,' information center are analyzed with a Python ML toolkit running in the Azure cloud. The system is also used to optimize feedstock mixtures and to estimate diesel sulfur content. Lab data is compared with refinery performance and scored with predictive models. Microsoft's cloud-based ML offering is now known as the Cortana Intelligence Suite.

Datum360 engineering data management for Maersk

Hosted tag and document management for Culzean development.

Maersk Oil has awarded a four-year contract to information management specialist Datum360 to implement a hosted engineering data management solution for its North Sea Culzean development. Datum's PIM360 will be deployed to design, create and maintain a tagging and numbering system tied to engineering documents that will track progress on the work. Datum360 CEO Steve Wilson said, 'Up to 60% of engineering time can be spent moving and organizing data. Our off the shelf solution is operational within days and can cost a tenth of competing solutions.' Datum360 is also advising Maersk on data control processes, software and training staff on engineering information systems.

See also our report on Bluefin's contribution to Culzean data management, on page 7 (SAP in oil and gas).

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Sales, deployments, partnerships …

BMT, Aker Solutions, ABB, Omnix, Aveva, SNC-Lavalin, CGI, Cortex, OFS Portal, DNV GL, Envecon, WG Consulting, IFS, GE, Oracle, Halliburton, IBM, LandWorks, US Land Grid, LMKR, FracGeo, Nvidia, OpenLink, P2, Quorum, Excellium, Virtalis, IFS, Wood Group, Yokogawa.

BMT Asia Pacific has been appointed owner's engineer and lead design consultant by Endeavor Energy, for the development of the LNG storage and regasification facility at the Songon gas to power project, Côte d'Ivoire.

Aker Solutions and **ABB** are to 'combined their strengths' in subsea, power and automation, integrating Aker's subsea capabilities with ABB's automation system expertise to enhance how production equipment on the seafloor is powered and controlled remotely.

Omnix International is to offer **Aveva**'s engineering software solutions to customers in the Saudi Arabia, Kuwait and Qatar region.

Engineer SNC-Lavalin has signed a 12 year, $500 million IT outsourcing agreement with **CGI** covering technology management and application requirements. SNC retains responsibility for strategy, cybersecurity and core application development.

Cortex Business Solutions is extending its 15-year partnership with **OFS Portal** as an approved network of e-invoicing solutions providers.

Statoil has awarded **DNV GL**'s oil and gas unit a master service agreement for studies of safety, platform technology, structural reanalysis and pipeline technology. Hull and structural inspection services, the control of complex lifting equipment and software and maintenance and IT service delivery are also in the deal.

Envecon has joined the **IFS** partner network as global services and channel partner for the North American, Middle Eastern, sub-Saharan African and European markets. **WG Consulting** has also joined the IFS network.

GE and **Oracle** have announced a strategic partnership to build a platform to 'digitally connect' industrial assets across the world. The platform combines GE's industrial internet 'Predix' offering with Oracle's cloud-based applications for ERP and supply chain management. The deal is touted as enabling the convergence of operational and information technologies.

GE Oil & Gas has signed a partnership agreement with the Iraqi Ministry of Oil for the provision of advanced equipment, technology upgrades, knowledge transfer, skills development and local employment.

Halliburton has ported its reservoir simulation software to the **IBM** cloud, leveraging its high performance computing and GPU technology.

GIS software house **LandWorks** is now a reseller of **US Land Grid**'s high resolution vector data.

LMKR has signed a global software reseller agreement with **FracGeo**.

Statoil has adopted **Nvidia**'s Grid 3D virtual desktop for its Petrel, DecisionSpace and RMS users in Norway and around the world.

Superior Plus Energy Services has selected **OpenLink**'s trading and risk solution its US refined fuels business.

Indigo Minerals has selected **P2**'s production solutions for its field data capture, hydrocarbon accounting and reporting.

Whiptail Midstream has deployed **Quorum**'s TIPS gas gathering software and its Crude Transportation package.

Excellium is to offer **Virtalis**' virtual reality systems and software to users of its Acumen Mobile software in the Middle East, Africa and Australia.

Wood Group has been awarded an 'evergreen' master services agreement by Statoil for life cycle engineering work on its offshore and onshore facilities.

India's Gas Transmission Company td. has awarded **Yokogawa** a contract for the revamp, modernization and expansion of its scada systems.

Standards stuff

Norway's regulations e-guide transfers to ECIM. OPC and W3C work on IoT interoperability. W3C's semantic sensor network ontology. SEG publishes SEG-D, Rev. 3.1 field-tape standard.

The **Norwegian Oil and Gas Association** has transferred management of its 'Guide to resource regulations, good governance' to the **EPIM** organization. The Guide, an electronic tool for good governance in the petroleum sector, is designed to help companies' understanding of the law and regulations, contracts and licensing. EPIM is working to integrate the system with its with its portfolio of services including the License2Share data trading service.

The **OPC Foundation** and **W3C** are to cooperate on internet of things (IoT) interoperability. A memorandum of understanding was signed at the recent Hannover Fair by OPC president Tom Burke and Dave Raggett, W3C lead for the 'web of things.' The collaboration will provide the infrastructure for the German Industrie 4.0 reference architecture for the 'smart factory.' The agreement focuses on a common framework for semantic interoperability and secure services across platforms and 'seamless interoperability in the IoT.'

The **W3C** has published a working draft of its semantic sensor network ontology (SSN) OWL-2 DL for describing sensors and measurements of the physical world. The modular architecture is said to support the 'judicious use of just enough ontology' for applications including satellite imagery, scientific and industrial monitoring and the IoT. SSN underpins IBM's 'Foundational ontologies for smarter industries' (OITJ 2015 N°1).

The **SEG** has adopted and published its SEG-D Rev. 3.1 field-tape standard. This revision recognizes significant developments in acquisition and computer technologies and brings the standard into line with current and envisioned industry techniques and practices. It also resolves longstanding ambiguities and corrects both typographic and factual errors in previous SEG-D standards. The revision adds support for coordinate reference system definition in OGP P1/11 format.

WIB-NL Annual Seminar, The Hague

Netherlands process automation users meet. Royal DSM, 'put the basics before big data.' Shell on the meter parameter 'explosion,' on inconsistent naming and avoiding 'unexpected behavior.'

The 2016 annual seminar of the Netherlands-based WIB process automation users' association was held earlier this year in The Hague. In a keynote address, Alex van Delft (**Royal DSM**) and Rene Rademakers (**Sabic**) warned that while 'big data,' 'internet of things,' 'Industrie 4.0' and other buzzwords make the headlines, there is also room for a focus on 'the basics.' Without the basics, neither big data, analytics, advanced control or remote operations will work.

Basic control loops need to be properly designed and tuned with the right sensors, the right actuators all functioning in the correct locations. Van Delft believes that a change in culture, from 'hobbyist to professional' is required to achieve sustainable results.

Surveys conducted among the WIB members have shown that a) 77% of controllers are not properly tuned, b) that 50% of control loops perform poorly due to control valve problems and c) trial and error is the most popular (but least effective) tuning method. Matters are complicated by the fact that new sensors may have hundreds parameters to set.

The 'explosion' of meter setting parameters was also addressed by **Shell**'s Peter Mooi. Setup with a handheld configurator is practically impossible and requires a proper instrument asset management system. For smart instruments, knowledge of all device parameters is required to enable proactive maintenance and to avoid unexpected behavior. Matters are complicated by the fact that there is little consistency between vendors in parameter naming. Nor even between device revisions of one vendor. On the plus side there is 'slow adaption' of the Namur NE107 standard for self-monitoring and diagnosis of field devices. Shell deploys a template methodology to achieve consistent parameter settings.

Read the WIB presentations here.

P2 Forecast promises probabilistic production profiles

New solution embeds 'BZ' physics-based analytics machine from BetaZi.

P2 Energy Solutions has announced P2 Forecast, a probabilistic production forecasting system for oil and gas. P2 Forecast is powered by BetaZi whose 'BZ Machine' is used to generate a million different decline curves from monthly production volumes. Privately held BetaZi's oil and gas production forecasting solutions uses 'physics-based predictive analytics,' developed by modeling over 400,000 production profiles. The company has been providing forecasts to producers and financiers since 2012.

P2 Forecast provides automated, machine-generated forecasts. P2 claims that blind tests of the technology have shown projections to be 'much more accurate' than those done by hand. The system generates fast and unbiased forecasts of a range of future production possibilities, from p1 to p99, for every well in which a company has interest.

University of California professor Jamie Rector, who co-chairs the joint SPE/SEG committee on multidisciplinary assessment of unconventional resource development said, 'Production engineers are trained to understand how wells operate, not for the fine details of curve fitting, differential equations, statistics and machine learning. P2 Forecast overcomes this common challenge and brings production forecasting and decline analysis into the modern world.'

BetaZi powered Merrick's PM4Cast package before its acquisition by P2 in 2014. Last year (OITJ 2015 N° 2), RPS' 'Reality Check' service was announced as also leveraging BetaZi's deal screening engine.

IO's 'integrated asset approach' methodology for BP

Two consulting engagements apply 'systems thinking' to capex reduction.

IO oil and gas consulting reports delivery of two studies for BP using its 'systems thinking' approach to reduce capital cost and improve project scheduling. IOOG is described as an 'independent venture' backed by GE Oil & Gas and McDermott.

An initial feasibility study for BP led to improvements in a project's concept, reducing costs and accelerating the schedule. Following the initial work, a follow-up contract was awarded that leveraged IO's Integrated asset approach.

The IAA methodology covers the whole production lifecycle from reservoir, production infrastructure through to delivery point.

IO CEO Dan Jackson said, 'IAA has systems thinking at its heart. The approach is a radical shift in the industry bringing increased likelihood of a positive investment decision.' BP VP Adrian Luckins added, 'IO is a fresh new player in the market and we are seeing real value in their expertise.' IO boasts ISO 9001:2015 certification for its quality management system and ISO/IEC 27001:2013 IT security and information management accreditation.

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Need subsea inspection? Wake-up the snake!

Kongsberg Maritime and Statoil back Eelume's subsea robot.

Kongsberg Maritime and Statoil have signed an agreement with Eelume, a spin-off of Norway's NTNU R&D organization, for the accelerated development of a 'snake robot' for subsea inspection, maintenance and repair. Eelume's snake, the fruit of 10 years research, is an autonomous, swimming robot that will reduce the requirement for support vessels. Its slender, flexible body enables access to confined areas. Eelume robots will be permanently installed on the seabed ready to be woken-up to perform planned or on-demand inspections and interventions. Typical jobs include visual inspection, and cleaning and adjusting valves and chokes. These are said to account for a large part of the total subsea inspection and intervention spend.

Kongsberg Maritime is to contribute its experience and marine robotics technology to the venture while Statoil will provide access to real installations for testing and qualification.

CTO Pål Liljebäck said, 'Eelume is the first company in the world to bring these robots into an industrial setting. We are now moving from academia into the commercial world.'

Asgeir Sørensen, director of the NTNU Centre for autonomous marine operations and systems added, 'Eelume is the 5th spin-off company from NTNU Amos.' Watch the snake in action on YouTube.

EOS 3D printing - stainless steel parts for MWD supplier

APS explains how it now prints turbine parts direct from SolidWorks.

Measurement while drilling equipment supplier APS recently announced a new approach to manufacturing with components made using industrial 3D-printing technology from EOS. APS' steerable drill motors, vibration dampers and sensors operate under harsh downhole conditions and the company is continuously seeking to improve its products. A variety of additive-manufacturing (AM) methods have been used in the past for testing and evaluation, but early 3D printers produced models in soft materials unsuited for the downhole environment.

Enter EOS' direct metal laser sintering technology that can produce components in stainless steel, Inconel and other metals ready for real-world use. The EOSINT M 280 system has been used to print parts for a turbine that powers a steerable drilling head and its onboard MWD system.

APS' Chris Funke told Oil IT Journal how the process worked. 'We start with a SolidWorks model and once the design is optimized for the additive process, we convert the file to an STL for ingestion into Materialise Magics for QC of the 3D model and to plan and optimize the AM process. Once the layout is complete, Magics' RP Tools produce slice files ready for the EOS machine.'

Compressor Controls' PI system good for 400k events/sec

TrainView LNG turbomachinery control system tracks vibration and shaft orbit eccentricity.

Compressor Controls Corporation is to embed OSIsoft's PI system in its TrainView II turbomachinery control system helping mitigate process disturbances, cut cost, and identify maintenance issues. CCC, a Roper Technologies unit, supplies turbomachinery control solutions to upstream, midstream and downstream companies where they are used to control LNG chilling and distribution. Previously it was up to CCC's customers to keep tabs on the equipment vibration and shaft orbit data. Now TrainView's PI system captures up to 400,000 events per second for high performance vibration diagnostics in real time.

The system consolidates current and historical data management into a single platform, enabling users to improve preventative maintenance, accelerate root-cause detection and cut analysis time and costs. Founded in 1974, CCC reports that more than 10,000 turbomachinery trains worldwide are powered by its control solutions.

Smart data validation for Shell's Project Vantage

Co-developed engineering data solution key to vision of 'single source' of live design information.

Hexagon (Intergraph) reports that as oil companies face the 'headwind' of lower energy prices, they are investing in technology automation and streamlining their processes to offset loss of revenue. Poster child is the work Hexagon is doing for Shell on ProjectVantage (OITJ 2015 N° 8), an integrated cloud platform for information development and management across suppliers, vendors and engineers. Project Vantage addresses design and engineering issues with a single-source of live design information, semi-automated data validation and consistency checking across disciplines, locations and contractors. On project completion, handover becomes a 'simple change in system access rights.'

Hexagon PP&M's Smart-Plant cloud is a key component of Shell's vision for streamlined capital project execution. Shell and Hexagon have teamed on Smart Plant extensions for data validation, transformation and migration to assure data quality at start-up and to managing the handover of data and documentation from projects to operations. Hexagon VP Patrick Holcomb observed that, 'The real value associated with quality data handover is in the operations phase as high-quality data is critical to the safe, reliable and effective operation of a facility.'