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Transforming offshore operations with data:

BP's production COO gets excited about analytics

Making SAP data entry faster

A better way to understand alarms

A new model for oil and gas logistics

ABB - increasing time between regular maintenance

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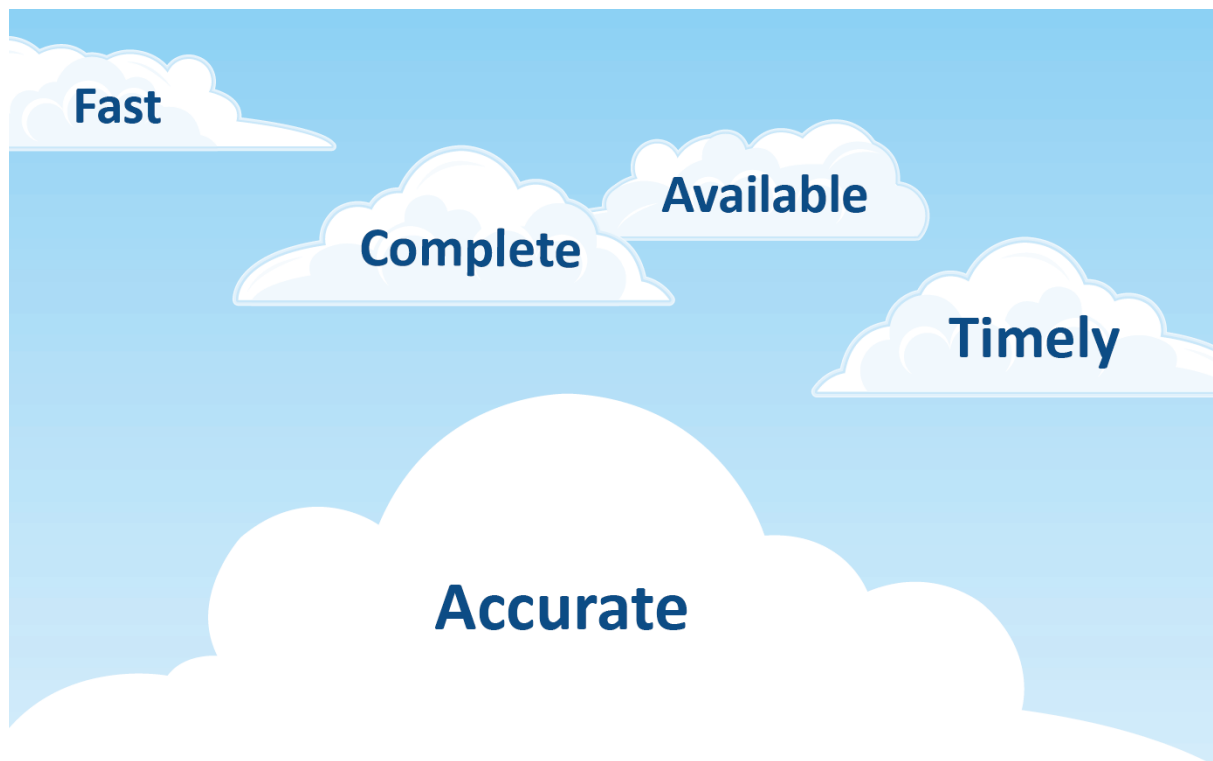


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Digital Energy Journal shares expertise about how to get more value from digital technology in the upstream oil and gas industry

Energistics - revising the standards architecture

Oil and gas data standards body Energistics has revised the architecture behind the standards, which should make building new software based on the standards much easier

Oil and gas data standards body Energistics has implemented a major revision behind its standards, WITSML (drilling data), PRODML (production data) and RESQML (reservoir data).

It will establish a common technical architecture behind the standards, which will mean that software is structured in standard 'data objects'. This should make it much easier to build software using data in the standard formats.

This will mean that (for example) information about the drilling (from WITSML) could be incorporated as part of the reservoir model (in RESQML). It could lead to the point where all of the standards covering the well lifecycle basically become one.

The first to be released was version 2 of RESQML published in September 2014, with version 2 of WITSML in early 2016, followed by version 2 of PRODML.

The new versions of the standards will also come with 'Energistics Transfer Protocol', which supports real time streaming of data. With previous versions, the data exchange was 'call and respond', where one system would request data and the other would send it. With the new version, the data exchange will be continuous, supporting much higher frequency data. This means that computer systems can be continually updated with live data.

The company recently appointed a new CEO, Ross Philo. Mr Philo is a former CIO of Maersk Oil in Denmark, where he oversaw a global SAP rollout. He has also held CIO leadership roles as a member of the executive team at Halliburton, USPS and FTSI.

Energistics plans to increase the number of training courses it runs, showing people how to get more out of the standards and apply them in their organisations. This will include sessions within a company and public sessions. "We've recognised the need for training courses, we will be ramping that up next year," Mr. Philo said.

Energistics will celebrate its 25th anniversary this year with a conference in Houston in November 2015.

Oil price and standards

The low oil price environment can be a big threat to organisations like Energistics, because it means that companies thinking short term are looking to cut costs wherever they can. They sometimes see membership fees of organisations like Energistics, and staff time to work on Energistics projects, as costs which can be cut, Mr Philo says.

But for companies thinking more long term, "the application of standards is an incredibly powerful way to drive cost savings across the industry," he says.

It is much easier to keep the data in your systems accurate when it is supplied in standard formats, and having reliably accurate data saves staff a lot of time.

"When your staff can find the data they need, they know it has come from a trusted source, and it is in a format which can be immediately incorporated into an application they are using, it means they become more productive," he says.

"Anecdotally we've had stories from members saying they have saved tens to hundreds of millions of dollars because



Driving a major revision of standards - Ross Philo, CEO of Energistics

Leaders

of improved efficiency, avoided software development, as well as direct time savings, because of data standards,” he says. “It has improved the overall efficiency of their operations.”

“The seamlessness that Energistics brings to the industry reduces friction between companies.”

Many companies are looking at standards as ‘the new innovation’, he says. “With standards in place a geoscientist can focus on what he or she does best. Rather than worry about the source of the data, they can focus on the innovation that their analysis brings to the table, helping them make good business decisions about prospective wells.”

Oil and gas data is extremely complex, with operational data changing in different time scales (for example you might record the temperature in the well every minute but record the drilling depth every hour). This has to fit with data describing the reservoir, which changes when someone makes a new reservoir model.

But where Energistics has already done the

difficult work of defining the data models, building the software gets much easier.

Mr Philo disputes the commonly stated figure that geoscientists spend half their time looking for data, but he says it might be true that they spend half of their time addressing data issues, such as where the co-ordinates are not correct. “There’s a lot of time spent validating the data in an interpretation,” he says.

“By relying on our three data standards, a geoscientist can trust the validity of the data as it is being presented and know these sorts of issues are already being addressed. They can become more productive and dramatically reduce the amount of data validation and data issues.”

Persuading people

The industry sometimes seems divided between people who understand the benefit of standards and people who don’t, and it is hard to convince the people who don’t understand the benefits.

“One of the challenges we have [is that] it’s very hard to get quantifiable case studies from companies about the value they’ve derived from using standards. It’s often highly confidential and competitive information they don’t want released,” he said.

“Many of the people who are really using these standards are at a middle management level or within the technical community of an oil and gas company or a service company. They realise that these standards are fundamental and an essential part of what they do on a day to day basis. [but] very often those same middle managers are having to persuade the executive management about the value of a continued membership of Energistics.”

“Part of my focus is to try to engage with senior managers to describe the value that their company is getting from the standards effort, and the participation that the employees are having in Energistics.”

Hopefully, “the same executives can begin to champion the argument in the industry that standards are good for the industry as a whole.”

BP’s Bernard Looney at Offshore Europe - ‘hope is not a strategy

BP’s Bernard Looney, COO of production, explained in his talk at Offshore Europe in Aberdeen what the company is doing to make sure it survives the current low oil price environment, with the conclusion “hope is not a strategy”

Bernard Looney, chief operating officer for production with BP, explained how BP is making sure it survives the current low oil price environment, grouping his thoughts around learning, investing and innovation.

He was speaking at a lunch meeting at Offshore Europe in Aberdeen, on Tuesday September 8, with the theme ‘New Times, New Challenges.’

Mr Looney is responsible for production operations, well operations, supply-chain management and engineering in the upstream.

Mr Looney began by citing the Oil and Gas Authority numbers that over 5,000 jobs have been lost in the UK oil and gas industry since late last year. ‘There’s no doubt these are very tough times,’ he said. ‘Many more are worried about their future.’

However, while some people might argue that talking about it would be therapeutic, “we’d all agree that [talking about it] is unlikely to move the ball,” he said.

“There are many reasons to be optimistic.”

“We’re in a growth industry - that isn’t going to change any time soon. Demand for energy will continue to rise. Demand will be 1/3rd higher in 2035 than today. An additional 1.6bn people will need energy.

“Despite the environment the industry continues to invest \$bns to bring new barrels to the marketplace.”

“Many people say, is the North Sea worth fighting for. For us, absolutely it is.”

“We’ve come through periods of low oil price before. Each low came with a unique set of circumstances. Our industry has always found a way.”

“It is a particularly tough assignment, [but] I believe we can do it and it is anything but mission impossible.”

Learning

“We talk a lot about learning,” he said. “We all do things in our companies we are proud of and we can share.”

“We’re engaging the front line - they know where we can improve.”



It is time for the oil and gas industry to catch up with big data - Bernard Looney, COO of production with BP

For example, in Egypt, BP staff calculated that if supply vessels travel at 90 per cent of their usual speed, they only need 70 per cent as much fuel.

“If we want to learn it has to start with the admission that others do things better,” he said. “We have to be open to learning from competition and the service sector.”

“We recently sold a set of assets to a small independent. [We found that] one operation that cost us \$1m would cost them \$0.5m. We said, ‘why can’t we do that?’”

“We’re learning a huge amount from that organisation and they are learning from us.”

“Previously when times were tough it was normal to turn on our contractors,” he said. “We can learn a huge amount from our suppliers about how we run our business.”

“We sat down with our key contractors like Wood Group. They provided us with lists of how we can save money. For example, scaffolding arrangements. These will generate millions of dollars in saving.”

Companies can also work together to figure out better ways that work can be done, examples being the Step Change in Safety project and the Helicopter Issues Task Group.

“The work [Wood Group chief executive] Bob Keiller did [leading the Helicopter Issues Task Group] was exemplary and without equal.”

“I believe it should be a source of strength and confidence.”

Investing in the future

When it comes to investing in the future, “In BP we’ve been focussing our asset portfolio and being clear in where we prioritise. Green vs brown, deepwater vs shallow, new basins vs strong incumbent position in mature regions,” he said.

“It is about playing to strengths.”

“In BP we’ve divested less strategic assets.”

One example of production improvement is with the Mungo Field in the Eastern Trough Area Project (ETAP), a network of nine smaller fields in the Central North Sea.

On the Mungo Field, BP managed to improve production five fold, with an “innovative horizontal completion of a section of reservoir which had been overlooked,” he said.

Innovation

On the topic of innovation, “we’re in a new age of big data,” he said

“Big data hit pharma [industry] 20 years ago, aviation 30 years ago, it is time for oil and gas to catch up.”

“We have a tool ‘Well Advisor’, a remote digital monitoring system.”

Part of Well Advisor is the use of sensors which detect friction (between the casing and well wall), which could be an early indication of the casing about to get stuck.

These sensors and the analysis of their data has been used for 400 runs of casing, without any casing getting stuck, he said.

The increased use of sensors has led to exponential growth in the amount of data BP has to manage, he said.

One example is a sand management system in Azerbaijan, which generates ‘gigabytes’ of data every day, he said.

“It used to take several weeks to bring to shore, now we can process and analyse the data in real time. We can see sanding events as they are about to happen, and make decisions with the latest data.”

“I took my leadership team to Silicon Valley,” he said. “I think we need to think differently. According to the CEO of a company in Palo Alto, these guys don’t just think differently, they smell differently,” he joked.

Analytics “can revolutionise how we drill wells and improve operational integrity of assets, improve the efficiency of our people,” he said.

Consider that “a hydrocarbon processing facility can have 50,000 routes for oil molecules to get to market. If you map all of these routes you can optimise production.”

“It could add 4 per cent to production throughput. [the costs are] low capex, hundreds of thousands of dollars, or millions, but not billions.”

BP ran a trial using big data analytics to screen large geoscience data sets, looking at data for 5,000 wells, covering 250,000km² of 3D seismic.

In particular, BP wanted to see if it could find any analogies (rock with similar reservoir properties) to the “Vorlich” discovery in

the central North Sea, a thin hydrocarbon bearing sand.

Normally, “a 100 well data set would take 1 geologist 1 month [to analyse]”, he said. “With this, 5,000 wells were analysed in minutes.”

In conclusion, “this is not a sunset industry, far from it. Oil is used in vehicles which are getting lighter and faster,” he said.

“We need to tell our stories. I continue to be amazed about the life and career this industry has offered me.”

“Investments we are making today will last until today’s students are older. By learning from each other and investing in innovation we can compete on a global scale.”

Questions

In the question and answer session, Mr Looney was asked by a representative of Capstone Turbine Corporation what is the best way a small supplier can engage with BP.

“There’s a lot of people out there with a lot of ideas struggling to get access to the company,” he said.

Together with Trevor Garlick, regional president of BP North Sea, “We’ve committed to open ourselves up more,” he said. “We’ll learn some things.”

Another example of this is the annual Share Fair in Aberdeen, where companies discuss their oil and gas projects.

“We used to present all our projects already sanctioned,” he said. “There’s talk now that instead of sharing problems we’ll share some of the challenges we have,” he said.

Mr Looney was asked by Patrick O’Brien, chief executive of the ITF (Industry Technology Facilitator) what BP was doing about enhanced oil recovery.

“Trevor Garlick [regional president of BP North Sea] has been leading a piece of work on EOR,” Mr Looney replied.

“People always want the new shiny thing, the new project, big exploration wells. Of course the North Sea needs that. [But] If we could get a bit more oil out of these fields (we have) that would have a big impact.”

“We’re trying to get some EOR schemes written down - see what this would look like, see what’s technically possible [before we try to work out what’s commercially possi-

Leaders

ble].

“It deserves as much attention or more attention in a period of low oil prices.”

Mr Looney was asked what is the biggest thing the company has learned from collaborating with suppliers.

“Suppliers are incredibly frustrated with how we deal with them. [for example] the number of people we have overseeing engineers in Wood Group.”

“Our 'man marking' is not where it needs to be.”

One supplier managed to help BP realise that it could save a quarter to half a million

pounds a year in Angola, by not renting so much scaffolding, he said.

We want the basin to be competitive. It starts with the admission you may not be the best in everything you do.”

“Yesterday we hosted a seismic sharing exercise, when companies shared how they process seismic, talking to people who in theory are competitors.”

“It is about opening ourselves up a bit.”

Mr Looney was asked how the industry can do more to develop known UK Continental Shelf discoveries now, rather than “wait for the infrastructure to disappear”.

“I think fundamentally we have to get devel-

opment costs of these projects in a more competitive space,” he said.

“We take a project like Mad Dog 2 [in the Gulf of Mexico] which cost \$20bn. We got it down to \$14bn. The question today is, could you do it for \$10bn. [we need] that degree of progress.”

“The project has got to compete. Some projects do. I'm optimistic that we'll do that.

There's no reason why these projects should not go ahead.”

Finally Mr Looney was asked about his oil price prediction.

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How people are using Harris CapRock's VSAT

The Advanced VSAT satellite communications solution from Harris CapRock allows satellite bandwidth to be assigned on demand, rather than being assigned in advance under long term contract. Here's how it is being used



Helping you dynamically change satcom bandwidth - Andy Lucas, CTO, Harris CapRock

In early 2014, Harris CapRock announced the launch of its Advanced VSAT technology, which would enable the amount of bandwidth to be changed with a few hours' notice.

Consider an oil and gas company which has purchased VSAT bandwidth the way it is normally purchased – with an always on, one megabit per second of data communication available for the offshore platform, to be divided between all of its users.

Using Advanced VSAT, it could request bandwidth be increased to 3.5 mbps for a few hours, for example if it is drilling a critical part of the well and wants to send higher resolution data to shore, or if a video conference is planned.

The changes can be made remotely, and there is no interruption to the satcom connection while the work is done.

The service is available for all major oil and gas offshore producing regions, says Andy Lucas, chief technology officer of Harris CapRock.

Previously, the only way to increase your bandwidth was often to send an engineer offshore with spare parts for the satellite communications equipment. This would often involve putting the satellite communications offline while the work was done.

Typically the company IT department or CIO will make the final request (to the satellite communications provider) to increase bandwidth, he says, following instructions from the asset manager.

With Advanced VSAT, the IT department can know exactly what the bandwidth increase will cost before requesting it, he says.

Thinking differently

People usually purchase satellite communications by trying to find the most bandwidth they can buy for the budget they have been assigned, rather than thinking about what capabilities they need, Mr. Lucas says.

But now, if customers can buy bandwidth 'on the fly,' they can think differently, he says.

For example, if a customer has a drilling problem downhole, they might think about sending a large (High Definition) video of the downhole problem to an onshore expert, so they can see what is happening. The satcom bandwidth could be increased to accommodate it.

“Customers call us and say, ‘We need the fol-

lowing bandwidth immediately because we have an operational situation on the rig, and we need more eyes on the problem,’” Mr. Lucas says. “We've got examples of where we can get additional bandwidth to them within an hour.”

Some companies are considering increasing bandwidth in the evening, when crew are more likely to want to access the internet. “We've had serious conversations about that with customers,” he says.

Better service

The Advanced VSAT service also has less jitter (shake) which makes voice calls easier, Mr. Lucas says.

It also has a lower latency (delay) between sending the data and receiving it.

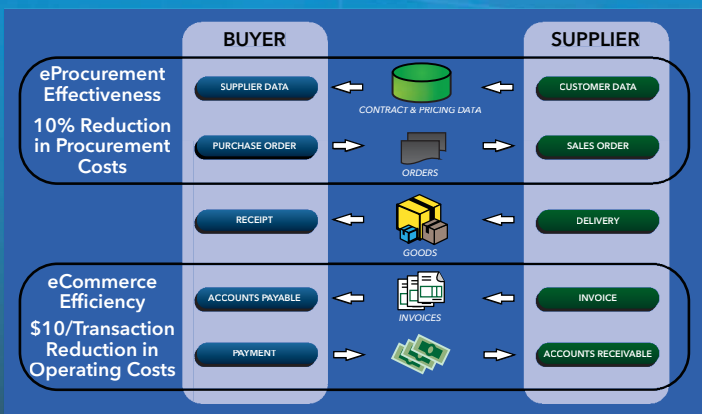
You can't reduce the latency caused by sending the data to the satellite and back, but you can reduce the latency caused by the hardware, Mr. Lucas says.

Lower latency makes voice phone calls more fluid, because you don't have to wait to hear what the other person says.

Lower latency is also more useful for software applications running over the communications link. Many offshore platforms run software which has been originally designed for use on land networks, and so do not expect any delay, Mr. Lucas says.

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NEOS - helping you explore with non-seismic

NEOS, an exploration solutions company based in San Francisco, is helping oil and gas companies do more with non-seismic technologies, such as gravity, magnetic, hyperspectral and electromagnetics

NEOS, an exploration solutions company headquartered in San Francisco, and with offices in Houston and Denver, is providing a range of exploration services that help oil and gas companies identify drilling prospects, develop insights to solve specific subsurface imaging problems, organise non-seismic data surveys and interpret the acquired data.

It provides services in both seismic and non-seismic, but the non-seismic services and associated workflows – including with electromagnetics and hyperspectral imaging, make the company unique, says Chris Friedemann, chief commercial officer with NEOS.

Investors include Goldman Sachs, Kleiner Perkins Caufield & Byers, Passport Capital, Bill Gates, and Ocado co-founder, Jonathan Faiman, now Executive Chairman at NEOS.

NEOS employs 80-90 people, of which over half are geoscientists.

The company's background is primarily non-seismic. It was originally established in 2003 with a big promise of exploring with satellite data imagery.

In 2010, the company re-orientated, with the realisation that seismic technology would continue to be the dominant exploration technology – but there was a business advantage to being able to do more with non-seismic technologies to support it.

At that time, it brought in a new management team, which had a strong background in seismic. The CEO since January 2010 is Jim Hollis, former COO at seismic company ION Geophysical.

The company announced in June 2015 that it had appointed Jonathan Faiman as chairman of the board. Mr Faiman is cofounder of UK online grocery store Ocado and previously worked in banking. He has a degree in physics from Imperial College London.

In August 2015, NEOS acquired ION's land seismic data processing operation. The team, now called NEOS Seismic Imaging Group, has completed nearly 400 subsurface imaging projects since 2003 for a range of different E&P companies. It specializes in 'hard rock' processing in structurally complex geologic environments ranging from Bolivia to the North Slope of Alaska and has special competence in anisotropic imaging, fracture detec-

tion, and onshore processing using pre-stack depth migration techniques.

Business offering

NEOS works closely with oil and gas company exploration departments. "It becomes a bit of an adjunct exploration function in some situations," Mr Friedemann says. Typically small and medium sized oil and gas companies have many seismic experts, but not so many experts in non-seismic technologies, so NEOS can fill this gap.

A typical project involves highgrading acreage and identifying potential drilling prospects from a range of data, Mr Friedemann says.

This is usually provided in the form of 'interpreted products' that integrate and interpret all G&G measurements. A unique NEOS offering involves the application of statistical predictive analytics techniques to all of the multi-physics geo-datasets and interpretive products NEOS has in its possession. The company identifies attributes that correspond to known fields or shale sweet spots, and then mathematically searches for these same correlative attribute suites in underexplored areas.

The company's projects often progress in a series of stages. The first stage of the work, which goes under the name 'neoSCAN', is an analysis of existing data and what is available in the public domain.

The second step, which it calls 'neoBASIN', is to commission new airborne measurements, perhaps new ground electromagnetic data, and integrate and interpret it.

The third step, 'neoPROSPECTOR', is to identify possible prospects in the subsurface by acquiring and interpreting finely

sampled 3-D seismic and EM data over the most promising neoBASIN lead areas.

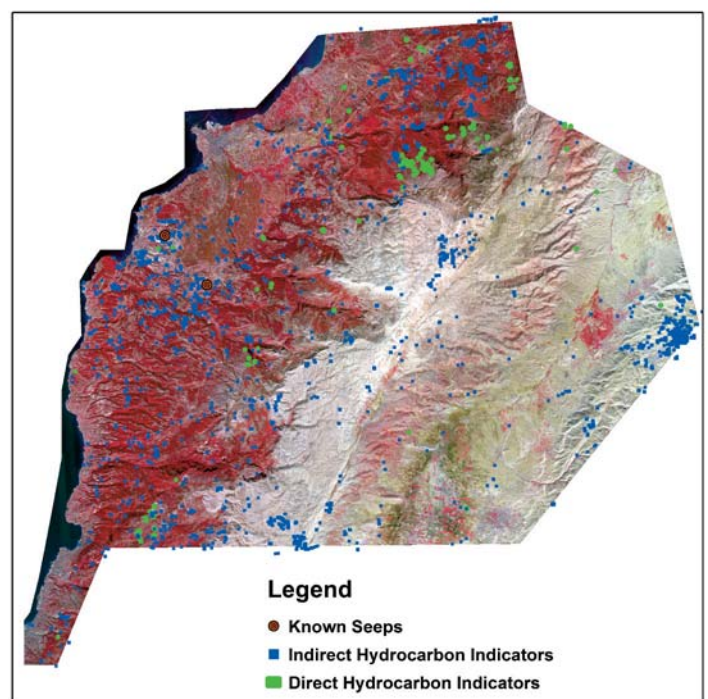
NEOS works for both E+P companies and for governments.

For E+P companies, it does both proprietary work and multiclient work, or projects which are a mixture (they are commissioned by one client but the data is typically made available for purchase by other companies after an exclusivity period).

For governments, it performs very large scale surveys, up to the size of the entire country. In these instances, NEOS may be asked to high-grade more than oil & gas acreage, but also to map other natural resource targets including metals, minerals, geothermal and groundwater. The outcomes help the country gather initial data which might encourage other industrial companies to commission more detailed geophysical surveys help the sovereign government portray the country's natural resource deposits in the most attractive light.

Hyperspectral

NEOS is particularly strong in 'hyperspectral' surveys, using equipment in an aeroplane to gather and analyse light reflected from the earth's surface in a much broader range than satellite 'multispectral' data does.



Using hyperspectral data to explore in Lebanon

A typical multispectral survey will typically survey 10 'bands' on the visible light spectrum (each 'band' could be considered a colour).

But the hyperspectral survey can get 300-400 bands, going further into non-visible light (infrared, and ultraviolet).

The logic is that hydrocarbons deep down in the earth will gradually seep up to the surface, and their presence in the soil can be detected either directly, or sometimes indirectly by looking for mineral or vegetative anomalies.

By analysing the density and location of these direct and indirect hydrocarbon indicators, one can try to work out the pathway the hydrocarbons may have taken towards the surface. If more hydrocarbons than expected have migrated to the surface, that could indicate a fault, providing an easy pathway.

NEOS recently completed a "country scale" exploration project in Lebanon, on behalf of the Energy Ministry, including a hyperspectral survey, which showed indicators of oil seeps near the surface.

The value of non-seismic

Seismic is certainly the most important survey technology, with about 95 per cent of exploration survey budgets spent on it, Mr Friedemann says. But the value of other technologies can often get overlooked.

Mr Friedemann says that exploration technologies could be looked at in a similar way to the range of technologies to help doctors understand the human body. The ultrasound survey (which could be seen as the acoustic equivalent to seismic) is extremely useful in understanding certain medical conditions, such as the presence of a mass or the health of a foetus. But doctors also use a variety of other techniques, including X-rays, blood tests, CT scans, MRI scans, which all tell

something unique.

"We're doing a similar thing," he said. "The seismic data is going to tell us about the hard structure of the subsurface. "These other measurements tell us [for example] how deep the basement is or what its rocks are comprised of, what's going on structurally and thermally. We use electromagnetics (EM) to help us see how resistivity might be changing. That can tell us what's happening within structures, what fluids they contain."

Aerial survey methods (which can include gravity, EM and hyperspectral) can be very useful in screening out which parts of the terrain are worth more attention, or are not.

Consider that onshore seismic surveys can cost \$30,000 to \$40,000 for a square kilometre, whilst aerial surveys can be \$1,000 per square kilometre, if you put together the costs of acquisition, processing and interpretation.

If the aerial survey can identify a single square kilometre which is not worth doing a seismic survey on, that means you are spending \$1,000 to save \$30,000, he said.

Also, since aerial surveys only involve 1 or 2 pilots during acquisition whereas seismic might involve dozens or even a hundred acquisition personnel, airborne surveys do not come with as high a safety risk as land based seismic surveys, he said.

Basement rock composition

NEOS was asked to investigate an idea from the chief geophysicist of one of the world's "largest and most technically respected" oil companies, that the likelihood of oil being present could be linked to the composition of the basement rock, Mr Friedemann says.

The geophysicist was working on the theory that the source-rock reservoir temperature would be linked to different lithologies (types

of rocks) comprising the basement. He believed that different rocks would conduct different amounts of heat, and that these temperature differences would result in differences in what fluids his wells produced – oil where the basement rock conducted less heat, and gas where a different basement rock conducted more heat. The NEOS work showed that the chief geophysicist was, in fact, correct.

The way NEOS solved the problem was through an integrated analysis of gravity, magnetic and electromagnetic measurements. By analysing differences in density, magnetic susceptibility and resistivity properties in the basement rock, NEOS was able to identify and map different basement rock types and correlate these differences to the gas vs. liquids content of the production flowstreams from the wells that had been drilled.

Workflows

One of the hardest elements with non-seismic data is coming up with the right workflows for using it all together, Mr Friedemann says.

NEOS has developed workflows which it believes no other companies have.

For example it has developed workflows for combining well log resistivity data from wells with ground- or seafloor-based magnetotelluric (MT) data and even active-source EM data acquired from planes and helicopters.

The well data provides detailed measurements, but only in the specific locations (and down to the measured depths) of the wells that have been drilled. The ground- or seafloor-based MT receivers help fill in this picture using receivers which are placed on the ground for 8-24 hours, and analyse how the sun's solar radiation interacts with the earth's magnetic field.

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Peter Breunig joins Maana Advisory board

Palo Alto based start-up Maana, which aims to revolutionise the way oil and gas companies work with data, has appointed Peter Breunig, former general manager of Technology Management at Chevron, to chair its oil and gas customer advisory board.

Maana (www.maana.io), a big data start-up company aiming to revolutionise the way oil and gas companies gain insights from their technical datasets across multiple data silos, has appointed Peter Breunig, formerly with Chevron, to chair its oil and gas customer advisory board.

Mr Breunig is a former general manager at Chevron, having lead Technology Management and Architecture, Technical Computing, and Seismic Imaging Research for the company.

"Maana's search and discovery platform is

unique and poised to change the way upstream oil and gas companies leverage their big data," Mr Breunig says.

"Increased use of sensors, coupled with the industry's increasing success at collecting data is driving wider acceptance of data ana-

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Chairing Maana's oil and gas customer advisory board – Peter Breunig, former lead technology management and architecture in technical computing and seismic imaging research for Chevron

lytics tools that promote better decision making, greater reliability and improved safety, and uncover affordable ways to find new reserves, predict failures and drive cost savings,” he says.

“Maana’s oil and gas advisory board will look at how oil and gas companies can use Maana to get more value from their various technical datasets,” says CEO Babur Ozden.

Maana’s software aims to help oil and gas companies use their data to answer questions such as which completions techniques yield the fewest production failures, which rigs and suppliers are most efficient, and where are the best opportunities for well workovers.

More From Your Existing Data

The core aim is to help oil and gas companies to use more of their existing data in day-to-day decisions by thousands of their employees.

“Day-to-day decisions by subject matter experts such as drilling engineers, petro-technical professionals, and field service technicians, eventually end up making or losing money for oil and gas employers,” Mr Ozden says.

“Oil and gas companies generate and store vast amounts of data, but ironically, 95 per cent of the day-to-day decisions are based on only 15 per cent of that data,” Mr Ozden says. “Something gets in the way.”

“Corporations have hundreds, sometimes thousands of data silos, but there’s no one single software out there that can crawl these sources, as Google or Bing crawls websites,” he says.

The Internet has over 16 billion silos, called websites, and it can be searched easily. Any new data on a website, almost instantly, is searchable, discoverable, and hence useful and useable by anyone. Why is this not the case for data in corporate data silos for use by employees?

“Maana’s algorithms and knowledge structure learns and adapts to the data that is crawled, no matter from which data silo it came,” says Mr Ozden. “We believe that information locked in corporate data silos can be discovered and operationalised just as easily as the information on the Internet, once exposed to Maana’s technology.”

Consider a subset of the upstream information systems that oil and gas companies use to store well data: drilling data in WellView or OpenWells; G&G data in OpenWorks and Petrel; log files in Recall or LAS files; financial data in SAP or JDE; and production data in Energy Components and OSI PI data historians. Each of these upstream applications has its own search tool and database. There is no unifying search tool that can index them all and run analytics across all these data sources. Maana wants to change this by approaching the problem of integrating technical datasets as a machine learning and search problem.

Maana leverages machine learning, information classification, information clustering and correlation clustering to discover relationships in the multiple technical datasets. Using these techniques, an emergent semantic graph develops that can be used to organize the petro-technical information. Specialized oil and gas search indexes, such as well names, drilling codes, business unit names and log types, can then be combined with the semantic graph to allow a very powerful integrated search to be performed across the multiple datasets.

“Operationalising” Data

The system is only useful if the results can be “operationalised”, or incorporated as part of people’s day-to-day work.

To make this easier, Maana develops custom interfaces (or apps) for different industry roles, drawing data from the main Maana data analytics systems, so everyone has the data they need.

These interfaces can be built in-house by staff, or developed by third party system integrators or other organisations with domain expertise, Ozden suggests.



Helping the oil and gas industry do more with data – Maana founder Babur Ozden

To write these interfaces “requires very specific know-how about someone’s job,” Mr Ozden says. However, these applications should be extremely simple to write, taking from two days to a week.

If you are a well planner looking for offset drilling performance information, a geologist looking for well logs or a field development engineer looking at risk factors in a certain basin, there will be an interface for you.

Maana aims to give you as much relevant information as possible. If you have a question, it gives you a framework you can build answers from, calculating what might be the most relevant to your question.

“Its goal is to find a set of search results that are very close to your business question,” Ozden says.

Data Processing

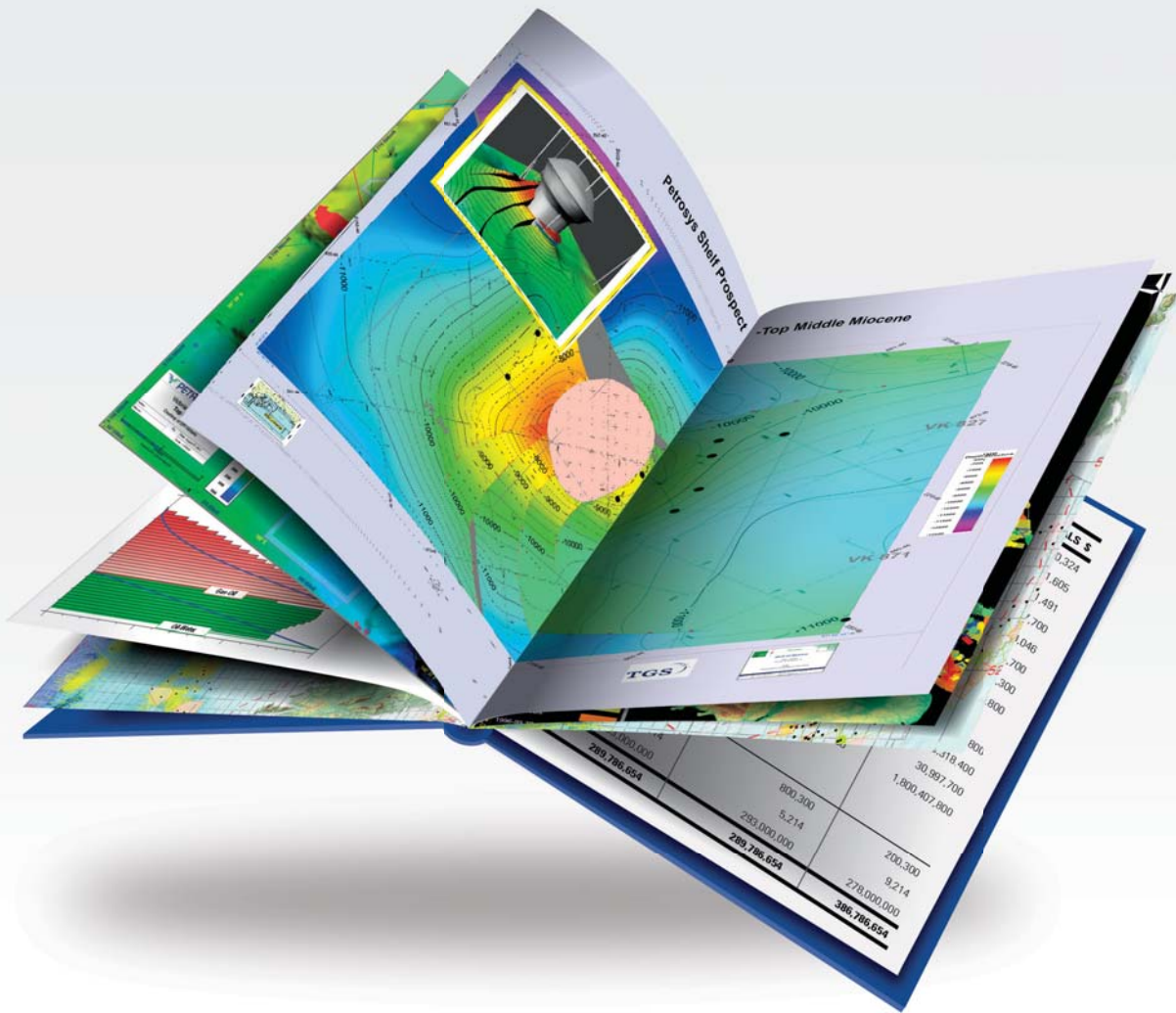
The most important aspect of Maana is the data analysis and processing framework.

The data does not need to be moved anywhere, it can be analysed from wherever it currently is.

Maana’s algorithms look for relationships between unstructured data and perform statistical analysis to see how your datasets are related to one another. These same statistical algorithms can also discover data similar to the data you are searching so you can benefit from past experiences.

This way, Maana aims to create structure and order out of a company’s disparate data sources and present it back to a user in a unified, analytical, searchable format.

MAPPING STANDARDS: A CORE COMPETENCY OF EVERY GEOSCIENTIST



Maps are a canvas used to express complex situations to help support difficult decisions.

In exploring the subsurface, maps serve a number of important purposes; recording and storing information; supporting the analysis of a range of subsurface data; and presenting and communicating information and understanding. Map creation should be a core competency of every geoscientist, used to express complex situations to help support difficult decisions.

Our consultants can help E&P companies define and implement appropriate mapping standards that will help geoscientists present a clear, consistent and concise suite of maps for a variety of purposes where having defined mapping standards has enabled the geoscientists to spend more of their time focusing on the technical content.

Petrosys is a powerful subsurface mapping system that brings all your critical knowledge together on one mapping canvas, our approach to surface modeling enables you to resolve complex challenges and to communicate geological information necessary for decision makers to take the right action. Learn more at www.petrosys.com.au/mapping-standards.

Data maturity in geology

How a data management 'capability maturity model' could be used in geological and geophysical data management

By Naila Huseyn-zada, principal consultant data management, Landmark Software and Services (Halliburton) in Baku, Azerbaijan



Naila Huseyn-zada, principal consultant data management, Landmark Software and Services (Halliburton) in Baku, Azerbaijan

A capability maturity model (CMM) analysis enables you to identify the current level of data quality in an organization, and the means of both improving data management and moving forward to eliminate gaps.

It could be used to assess the maturity of geological and geophysical data management. This method has been piloted on Landmark's OpenWorks database, and can be applied to any similar geo-data database.

Maturity levels

CMM uses five maturity levels to assess the data management maturity for geological and geophysical data.

Level I – The Initial Level. The lack of rules, standards, or procedures characterizes Level I as chaotic. While the use of a specialized database helps to structure data, the absence of a data management policy can create a situation in which data are available but not useful; data may exist by different names, which leads to duplication and data disorder. Additional, data sets may not be fully complete and may contain unconfirmed data with no assurance of accuracy.

Level II - The Recognizing Level. The movement from Level I to Level II calls for implementing data management rules. Quality requirements dictate the development and implementation of standards and procedures. Organizing the data increases the level of data integration within the project and allows only accurate and consistent data to be maintained within the project.

Level III - The Defining Level. Implementing the data management policy and adjusting all or most data types to stipulated data quality requirements enables the move from Level II to Level III up the data capability maturity ladder where data are treated as a corporate asset.

To successfully meet the requirements of Level III, data management should be centralized and standards and procedures applied

consistently across the organization. However, at this level, an insufficient centralized data management process often leads to the creation of a variety of similar standards or to standards that can vary between asset teams. Consequently, integration across various projects can be a complex process.

Level IV - The Managing Level. Data on Level IV are already integrated into the corporate data structures and managed centrally. At Level IV, management of metadata, data about data, is implemented and the process of catalyzing all data into corporate data structures/repositories begins.

Level V - The Optimizing Level. At Level V, the data quality, standards, guidelines, and procedures are continually improved. Any changes applied to the data first go through data processing to meet the standards and documenting requirements within the metadata repository.

Weight factor

Because project data are not equal, the weight factor of data must be used. The weight factor is a numerical assignment that reflects the relative importance of a parameter as compared to other parameters.

Fundamental data: the functioning of all or most applications is impossible if these data are absent or of low quality. Data in this category include seismic data, well headers, well positioning data, and seismic survey data.

The **Main data** enable comprehensive research to be conducted on the basis of fundamental data, and are the primary results of this research. This category includes interpretation data, such as seismic horizons and faults, and log curve data.

Minor data increases the efficiency of analytical research; they are minor data both for applications and for users. Cultural data, well completion and plugging data, and data lists are examples of this category

Secondary Data includes intermediate or temporary data, such as application sessions and well notes.

Evaluation matrix

The next step is the development of an evaluation matrix.

At Level I, the data simply exists, and there are no requirements for them, in other words, data management comes from simply loading data to a project. At this level, one or another type of data is present in a project, enabling a quantitative analysis to be performed and the weight factor for each data type to be specified

Criteria of Level II include quality requirements, working standards, working procedures, and integration within a project, which indicate the presence of standards and procedures of one work group. These standards or procedures, however, may not be obligatory for other work groups. At the second level of maturity, it is assumed that all or most data have been processed in accordance with quality requirements, meaning that standards and conventions have been created.

At Level III, the standards and procedures are common for all work groups of the organization and the data can be integrated between various projects without additional processing. Such concepts include corporate quality requirements, corporate standards, corporate procedures, and integration across different corporate projects. The list of corporate requirements, standards, and procedures is similar to the list of the second level.

Level IV criteria include replication to a corporate repository, integration across various databases, metadata cataloging, and integration of projects at a corporate level. When a corporate data structure has been created, and data are replicated to the metadata repository and documented, the fourth level has created a basis for the next level.

At Level V, it is accepted that the replication to the metadata repository has occurred and that integration across various corporate repositories is in place.

Data evaluation

The next stage of the evaluation involves gathering information about the evaluated data of the project(s). Both quantitative and qualitative methods can be used to collect the information.

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The full length paper can be downloaded at www.d-e-j.com/media/NailyaGuseinzade.pdf
Or
<http://bit.ly/CMMNG>

WellAware - \$16m funding for well monitoring

San Antonio (Texas) based well monitoring company WellAware announced \$16m of new financing on September 1 2015, led by trading house Mitsui & Co Ltd, and real time data company Genscape Inc.

The company plans to use the funds to expand operations and augment its oilfield analytics product development.

This money adds to the \$45m the company has received since being founded in October 2013, with funding from Activant Capital Group; Mexican investor Carlos Slim; Ed Whitacre Jr., the former chairman of the board and chief executive officer of AT&T and General Motors; and Dick Cheney, former Vice President of the United States and former chairman and chief executive officer of Halliburton.

The company's unique selling proposition, it says, is to offer a 'full stack' service. In other words, you pay one cheque to WellAware and it will install sensors on your wells, manage the data collection, and run software to deliver data (and data entry tools) to your cellphone.

In 2012, when the company was founded, there were plenty of companies offering a well monitoring service, but companies were still employing staff to drive around to well heads taken manual readings, so something wasn't working, says Matt Harrison, co-founder and CEO of WellAware.

Mr Harrison's idea is that companies would be much more tempted to install well monitoring services if it was much easier to do, and provided as an integrated service. So he set about building a business to provide it.

The sort of thing the software helps people spot includes a decline in production rate, a decline or elevation of pressure in the well, a rapid change of level in a tank (which could indicate a spill or theft). "We're monitoring and alarming many different parameters and conditions," he said.

Mr Harrison sees his business as analogous to Nest Labs, the home equipment company based in Palo Alto which designed a wi-fi enabled home thermostat and was acquired by Google in 2014 for \$3.2bn. The company did not invent the thermostat, but it invented a complete system including thermostats, software, internet services and mobile phone Apps to manage home temperature, and did the same for smoke alarms and home security.

Before 2012, Mr Harrison was mainly looking at medical electronics technology, including scanning technology and

implantable technology. Matt Harrison is also a partner with InCube Ventures, a medical device venture capital firm. Before joining InCube, Mr Harrison was general manager of Texas Instruments Medical Business Unit.

Welder Exploration

Welder Exploration and Production, a company based in San Antonio, Texas, has calculated that the payback time for investing in WellAware's services was just 4 months.

The company founder Raymond Welder was so impressed he subsequently joined WellAware's board.

Welder Exploration specialises in onshore wells in the Southern and Coastal Bend region of Texas.

Before installing WellAware, the company was taking production data by driving out to the wells and reading gauges, a task which was "laborious, manual, time consuming and expensive," says founder Raymond Welder.

"We would visit wells daily, write down information in books, go back to office and type it in a computer," he says. "There was lag time between actual production and when the office knew about it. The data was not always reliable."

"All of the many steps in the gauging and information gathering process translated into significant amount of production downtime."

The company had been looking for a well monitoring service for some time. "We've reached out to a number of well monitoring companies. [but] we found the software was not terribly intuitive especially for non-technical users, and also customer service was lacking," he said.

"Since taking on WellAware, our asset management teams get real data in real time from the wells. [We need] fewer miles on road, less wear and tear on trucks, [leading to] fewer opportunity for accidents.

The company is saving \$340,000 a year from not having to drive to the wells, in terms of truck costs, insurance and people's time, he said. It has earned an additional \$265,000 by decreasing down time from wells, achieved through the monitoring data.

"We've decreased safety incidents by having fewer operators in field."

"If it weren't for WellAware and its platform, our people wouldn't be able to produce more for less and our company wouldn't be on the growth trajectory which it is today," he said.

"With WellAware, instead of information gatherers, our people have become troubleshooters and problem solvers."

Chemical management

WellAware recently started providing services to help oil and gas companies gather data about well site chemicals, for example chemicals which neutralise hydrogen sulphide in the oil stream.

Problems commonly found include low tank levels, leaks, inoperable pumps and injection rates outside an expected range.

For example, if the injection rate of paraffin inhibitors or H₂S scavengers (chemicals which remove H₂S) is lower than anticipated, it can lead to a requirement for well remediation treatments or well shut ins, leading to reduced production.

The WellAware service collects data about chemical tank levels and pump operations. It will monitor how much chemicals are being injected and can also automate the dosing.

It aims to replace the need for technicians to drive to well sites to check chemical treatment processes.

You might want to regulate the dosing according to how much oil and gas is actually being produced, and reduce the dosing automatically if the production declines.

"Historically it's been something that's had very little visibility for operators. They get an invoice every month but they don't know how much is being dosed and when it's being dosed," Mr Harrison says.

Sensors, communications and mobile

WellAware's services include sensors at the well site, communications services, and software and analytics so you can monitor what is happening, including on your cellphone.

Its sensors can fit any size of tank and take minutes to install, and are fitted with a radio and internal battery which lasts several years.

Data is communicated every 15 minutes. The data is communicated by whatever wireless system is available. The data can be communicated by cell phone, satellite, the RPMA communications network, and 900 Mhz radio communications.

Communicating data by wireless from well heads is one of the hardest parts of the service. It is "a huge challenge and huge expense," Mr Harrison. "We've gone to the extent of building our own wireless net-

works over certain oil and gas fields."

The use of mobile devices, for entering and viewing data, continues to increase, Mr Harrison says, and now the data is viewed more on mobile devices than on PCs.

"For WellAware, we began developing our software platform with a mobile first mindset, recognising that more people are moving to a portable panel of glass," he says.

When mobile devices are used to input data, it means that all company personnel can immediately see the same data that maintenance staff can see, and everybody sees the same thing. "The VP of operations is seeing

some of the same data in real time as his field team in Eagle Ford Shale in South Texas is out working on those assets," he says. "It connects the human aspects with the automated aspects."

The mobile software is also designed to work offline where there is no internet connection available, since many well sites are in remote places which do not have cell-phone coverage.

The challenge with mobile is trying to get what you need on the small screen area. "If you try to get everything on a mobile device it can be a frustrating experience," he says.

www.wellaware.us.

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Honeywell's Digital Suites to help you uncover the value of your data

Engineering company Honeywell reports that its 'Digital Suites for Oil and Gas' software, that helps engineers and operators to uncover the value of data to improve production efficiency and safety, are seeing continued take-up in the industry.

The aim is to help companies do more with the data they have, supporting and providing various disciplines with useful views and relevant information on past and current condition in a more automated manner, to help them be more aware, proactive and efficient, says Michele Loseto, product manager at Honeywell Process Solutions. This can help them improve production uptime, detect issues earlier and make better decisions.

It can work with all kinds of plant data, including data from Honeywell's own control, instrumentation and automation systems, or from third party systems.

The software suite can provide an insight into what is going on, where the issues are, prioritize them, facilitate collaboration and where possible and direct people on the steps to take.

The suites can be used for both offshore and onshore production, with some components having applicability downstream.

The software often gets implemented after a customer has a specific problem they take to Honeywell, and Honeywell consultants analyze the context, drivers and needs to recommend options that could be followed, Mr Loseto says.

Sometimes the software is purchased by the company IT department, sometimes it is purchased by the final users, for example the production department or instrumentation

and control department, Mr Loseto says.

Six suites

The **Operational Data suite** can be used to capture, manage and visualize your operational data archive.

The **Process Safety suite** can be used to monitor the safety and process reliability of operations, including monitoring safety systems and shutdown systems, providing real time and historical views, as well as reports for safety audits.

The **Equipment Effectiveness suite** enables you to monitor equipment condition and see ways to improve uptime and reliability. You can set up different 'fault models' to see how close you are to a problem. You can set up 'exception based surveillance', receiving a set of alarms when certain conditions are met.

The **Production Surveillance suite** can be used to monitor health and performance of your wells, capture and validate well tests, and continuously monitor production at various levels.

The **Production Excellence suite** can be used to plan and optimise production. You can define your operational targets and use available data to see if you are reaching them.

The **Operational Performance suite** gives

an overview about all aspects of operations. This could be described as a 'high level' suite, giving a roll-up of data from the other suites. It displays everything in one large holistic picture.

Asia Pacific coal seam gas producer

In one example, Digital Suites was used by an Asia Pacific coal seam gas producer.

The operator wanted to tackle the uncertainty and data inaccuracy which often gets in the way of the task of bringing new fields on-stream. It wanted to get a better understanding of well data, detect abnormal conditions earlier and identify location.

Before implementing the system, the company was gathering data from various different reservoir and well engineering applications and spreadsheets and putting it together manually.

The company implemented Honeywell's Operational Data suite, providing the data management foundation, with data archiving, the Production Surveillance suite to monitor the wells, and the Operational Performance suite as the enterprise collaboration layer with smart alerts and collaborative workflows.

The company is now preparing to use the system on its entire field, with over 6,000 wells on 2 basins, after an initial trail on around 150 wells.

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Collaboration systems - keeping the users in charge

Perhaps the most important factor when implementing oil and gas collaboration environments is to keep the users involved in development of the system – and avoid the IT department taking over the project, says Wipro's Matt Graves

One of the most critical issues when implementing oil and gas collaboration environments is making sure that the people who are going to use it have control over how the system is developed, says Matt Graves, Managing Consultant for Integrated Operations with the Energy, Natural Resources and Utilities (ENU) division of Wipro.

“Often [collaboration system] projects start with good intent, you find the right business sponsor, you start to gather business level requirements, it all starts off really well,” Mr Graves says.

But “as things develop and the project moves into design and delivery, more and more you get involvement of the IT department in some of the technical enabling aspects of the project.”

“The delivery of IT and technology can be quite complex, there's lots of things to consider. For example, [the questions of] how to integrate the technology into the existing platforms, is it going to work, which products do you select, how is it going to be displayed on screen. It can get complicated and expensive.”

“Often what happens is, after the good intent, things get over-run by the IT department. It starts to block out the true original intention of the project. You start making changes, not based on user requirements but based on the IT constraints and IT budget. “The people side of things get forgotten.”

“Your project management must be very strong in not allowing the IT monster, the IT side of things, to take over,” he says. “That is often what can happen. Make sure all decision making goes back to the business.”

There have also been quite a few examples of projects which haven't delivered the expected results, or where the technology was developed but never used. “We often go into assets and see the same issues and problems which collaborative environments,” he says. “We've had a few projects which got into great difficulties.”

You need leaders within each of the teams who will act as ‘change agents’ to get the project moving, he says. “It is very important to get the offshore folks involved –

that's often forgotten.” When everything is built, “these guys will be owning the solution.”

Wipro

For the past four years Mr. Graves has been working in the Digital Oilfields (DOF) environment for an oil and gas super major as part of global program to deliver Collaborative Work Environments (CWE) to the upstream producing assets.

This includes projects in the UK (Aberdeen), Norway, the Netherlands, Malaysia, Australia, the Gulf of Mexico, Canada (Calgary), Gabon and Nigeria.

Having an external company (like Wipro) acting as an ‘agent for change’ can be very helpful, he says, in making sure that the users' views get taken into account, and trying to keep them engaged with the project. “We often try to identify a champion who is a spokesperson – at the user level,” he said.

Collaboration environments

Collaboration environments are physical places where people from different oil and gas disciplines can work together, and share the same data, to make sure that production operations are as safe and effective as possible.

The aim is that people in different company departments, and working in different physical places, should be able to work together more easily and share the same data, not in isolation as they often did in the past.

The collaboration environment can bring together onshore and offshore staff, and people in different departments, for example reservoirs, production, chemistry, maintenance and logistics.

The large majority of the Collaborative working environments are focussed on production operations, monitoring operations continuously as production comes through the well, through the facility and onto despatch, Mr Graves says.

Sometimes decisions need to be made quickly, for example if pressures at the bottom of the well start going out of a safe op-

erating range. Often a number of people might need to be involved in a decision. “In this environment, minutes cost thousands of dollars,” he says. It is good “if you can cut that decision making time by connecting the right people.”

Re-organising

If you are re-organising work so people work in collaborative teams, then there will be some team re-organisation required, he says, which is never very popular.

Sometimes the restructuring can be done before the technology is introduced.

Getting it done requires a mixture of ‘mandate’ (when people are told what to do) and ‘participation’ – where you encourage people to get involved, he says.

To encourage people to work in a different way, you need to do more than just rewrite the company's Standard Operating Procedures (SOPs), he says.

Customised for the asset

Another important factor for success is to focus on something which works for the specific asset, rather than trying to fix the whole company at once, he said. “Every asset thinks differently.”

The software must show the information and metrics which the team actually needs, shown to the right people in the right way.

A good system might (for example) have all the data ready prepared for staff to discuss in their morning meeting, with a visualisation of the previous day's activity.

A visualisation might need information about your wells, how the topsides are performing, the daily and weekly plan, a messaging board, and the production data.

It is too common for a company to decide at a high level to implement a certain software system, and when it appears in the collaborative work environment, no-one knows how to use it or what it is telling them, Mr Graves says.

Winshuttle - making it easier to manage data in SAP

Winshuttle, a company headquartered in Washington State, USA, has developed a software platform which makes entering and updating data in SAP much easier.



Helping you put data in SAP - Kristian Kalsing, VP Enterprise Solutions with Winshuttle

Consider the task to update the payment details for a number of suppliers in SAP.

The standard method of doing it with SAP is to logon, go to the contacts section, find the right contact, and the right field, update the field, then several other staff members have to go through the same process to approve it.

Using Winshuttle's software, you can easily create a spreadsheet template that extracts the existing supplier details from SAP, update the details in Excel, and then press a button and Winshuttle's tool will 'shuttle' the data into SAP.

It will give you a list of any records which fail to pass data validation checks and why, so you can correct it.

If the data needs to be approved by a colleague, she can also see the data which needs to be checked and approved on a spreadsheet.

Enterprise software people might despise spreadsheets, but they are a great tool for one person to work on their own data. So perhaps instead of trying to persuade users to move from spreadsheets to entering data directly into enterprise systems, it would be easier to build a bridge to move the data from the spreadsheet into the enterprise system.

Winshuttle also has tools to enter or approve data via a simpler online form, which might be easier if there is less data to enter.

Oil and gas companies can get control of their SAP ERP data by using these "lean applications" to streamline data collection, validation and movement (upload/download).

Because of the relative simplicity of the solutions, IT teams can delegate ownership and

maintenance of data back to the business, allowing them to increase the number and speed of projects.

Winshuttle's lean data management platform is used by 8 of the top 10 oil and gas companies, according to Winshuttle.

More data updating

The easier it is to enter data, the more likely it is that the data actually gets entered. It is not uncommon for incorrect data in SAP to be left uncorrected, because it can be too tedious to correct it, says Kristian Kalsing, VP of Enterprise Solutions at Winshuttle.

To take an oil and gas industry example, some drilling data experts say that there are many ways to optimise drilling work which is not being done, simply because offshore drilling engineers cannot be persuaded to enter the necessary data into computer systems. The easier it is to enter data, the less likely this is.

A side benefit is that employees doing less tedious data entry are probably happier and in a more proactive frame of mind.

SAP's main strength is that it is "a great transactional backbone in large companies," Mr Kalsing says.

But many companies which deploy it underestimate how much work is involved in maintaining the data.

"We often hear senior managers say, we didn't realise before we put in SAP that we would commit 30% of everybody's time committing data in the system," he says.

It can mean that staffers, for example supply chain managers, spend 20-40% of their time doing manual data work.

And as the amount of data companies work with increases, so will the amount of time needed to keep it up to date.

"SAP is a very data hungry application. To get the benefit of SAP, you need to have all the data in there and really high data quality," Mr Kalsing says.

This means that data needs to be entered correctly into SAP, and any errors need to be quickly corrected.

"Perhaps the main reason people complain about SAP is because they find inaccuracies in the data within it", Mr Kalsing says.

SAP has been designed to try to work with many different industries, and so it is not optimised for individual users. It can be customised, but that is expensive.

Software adoption

What is perhaps most surprising about Winshuttle is that it is so unusual to hear about a software company finding success by helping make software easier to use.

Winshuttle finds its foothold in companies by providing a simple solution to a really difficult or tedious data updating problem.

Once SAP users start to see the benefit, they find other ways to use it, and usage spreads in the company.

This is very different from the usual 'big bang' IT roll out approach," Mr Kalsing says. "Our lean applications are built iteratively in short cycle times, so you can gain quick wins while remaining agile as business processes evolve," he said.

Rowan Companies

One customer in the oil & gas industry is Rowan Companies Inc., a drilling company which operates 22 offshore jack-up rigs and 32 deep well land drilling rigs, and has an equipment manufacturing division.

Rowan's SAP project team had a project to clean up master data, and find an easier way to load financial data into the system.

The company was finding that the process of gathering master data from other legacy computer systems was leading to faults in the data.

The company was sending its customers bills every month, with each bill including many different line items such as drill rig operating hours, catering, and maintenance.

In order to create the bills, it was pasting lines from the customer contract into Excel, updating the billable hours for each line, and then pasting all of this in the billing screen of SAP, with 13 line blocks of data from Excel into SAP; a very tedious process, which also caused delays at the end of the month.

Production

Now it is all completed with a Winshuttle template.

The billing agent puts in all the header type information (customer, contract no, date), then runs a script to read the contract lines out to the template.

The agent then fills in the time to bill for each type of service, marking the unused lines for deletion, running a second script to create the sales order.

“It probably wouldn’t be too bold to say that Winshuttle saved us from an entire process redesign of billing,” says Rick Sonora, Billing Manager at Rowan.

The company started doing it using SAP “LSMWs” (Legacy System Migration Workbench) tools to upload the journal entries, but these were not flexible, and needed to be flexible because the requirements were con-

stantly changing.

Rowan started using Winshuttle’s “Transaction” tool, which maps the relevant SAP fields to an Excel spreadsheet.

It can create a “Shuttle” file template, where the user adds the data into Excel, creating a template for shuttling the data into SAP.

“We had one large LSMW [Legacy System Migration Workbench] which was built to edit all of the fields in a Vendor Master Record,” says Andy Hart, assistant controller at Rowan.

“However, it was the Vendor Tax ID numbers within these records that specifically needed to be cleaned up.”

“Once the team gathered the Tax ID numbers, they could easily create a Winshuttle template on the fly to update the Tax ID

number field, and not have to worry about an Excel spreadsheet which contained all of the Vendor fields.”

The master data clean-up project was completed in just 4 months, leaving time for additional end-user training and post-production support.

“What were once dreaded and laborious journal entries, are now user-friendly and easy to organise,” he says.

“Winshuttle improves our productivity as a team and as an organization, so we’re better able to step back and take a broad look at the overall efficiency of our financial implementation,” says Mr Hart.

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Learn more about Winshuttle’s Lean Data Management platform by visiting <http://www.winshuttle.com/lean-data-management>

Intelligent Plant - making it easier to work with plant data

Intelligent Plant of Aberdeen aims to help engineers get a much better understanding of how their plant is operating – by helping them view existing data in a clearer way

Intelligent Plant, a start-up software company in Aberdeen, help oil and gas engineers get a much better understanding of how their plant is operating – by being able to view existing data in a much clearer way.

Steve Aitken, consultant director for Intelligent Plant, believes there is much room for improvement in the way plant data is presented.

The company focusses on three areas – alarms and alarm management, P+ID diagrams, and spotting trends.

When it comes to alarms, it is no secret that some alarms have been disabled on plant, because they have been going off too often and set wrong. But the data behind them is usually so hard to find, setting them correctly is a real headache.

With P+ID diagrams, many old pieces of plant still have diagrams on paper, or (in some cases) written on the wall.

And with data stored in many different places and in different formats, spotting critical trends can be extremely difficult.

Intelligent Plant does not take ownership of any data, or even run critical company data

through its own servers. It simply provides a software tool which oil and gas companies can install on their networks.

All of the information is displayed in HTML5 format so it can work on PCs, tablets and smart phones. Users pay to use the software by the hour.

The information display is geared towards presenting data in a way which is much easier to work with, making it easier to share, and avoiding the need for manual calculations.

The company provides a mixture of service and product, although it started off just providing a service. A lot of the work Intelligent Plant does is bespoke for clients.

Most of the bespoke work “has some aspect of engineering or real time data or alarm and event data, because that’s where our expertise lies, making software for engineers,” Mr Aitken says.

Intelligent Plant currently has 10 employees.

Alarms

The alarms management tool aims to provide a simple display, where you can see the

operating parameters over a past period (for example a day or a week) and which alarms annunciated (sounded).

This can be used by the instrumentation technical authority to check that the alarms were set correctly. Did an alarm go off when operating parameters were at a level where staff needed to be warned? Did an alarm go off when operating parameters were within safe working limits, so the alarm was unnecessary?

“The alarm data has been much neglected in the past and only used to bash people on the head and say you’ve got too many, alarms,” Mr Aitken says.

The software can take data from OSISOFT’s “PI” data historian, to access historical operating data.

Typically in oil and gas companies, many people can access PI data, but hardly anyone has access to alarms data, Mr Nicolson says.

The software also generates high level reports, which should be made available to the Offshore Installation Manager (OIM), so he can check everything is running properly.

The software can also automatically present

data in accordance with the Engineering Equipment and Materials Users Association (EEMUA) standard 191 “Alarm systems - a guide to design, management and procurement.”

It can generate reports in the required standard which UK offshore operators are required to give to the UK Health and Safety executive (HSE).

Diagrams

The company makes tools to work with your piping and instrumentation (P+ID) diagrams.

Many companies have thousands of such diagrams, showing their vessels, pumps and compressors, all stored electronically.

Entering the diagrams into a new system can be a huge amount of effort with thousands of man hours.

Intelligent Plant has written software tools which can take the P+ID files in old software formats and upgrade them. Making a data translator is a very tricky software task, which is why many companies don't bother – although it is possible, Mr Nicolson says.

The processing is done using software, not by rekeying data in a data outsource centre. This means that accuracy levels are higher.

This tool could be used by anyone who needs to work with P+ID pictures, to understand what the plant is doing.

Trends

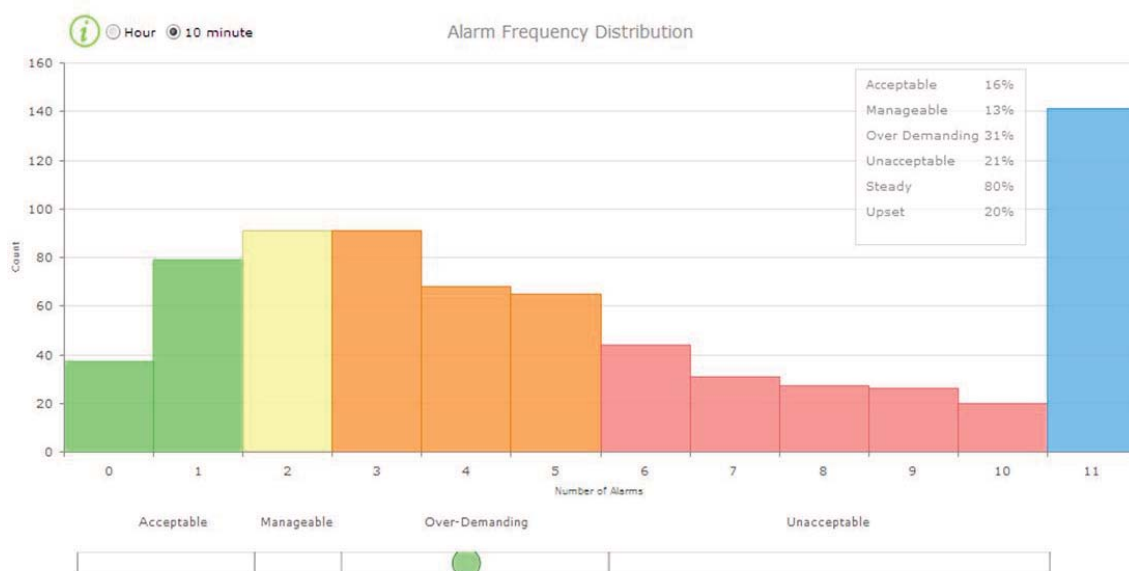
Intelligent Plant has built “trending” tools, so you can see how data is changing over time.

Intelligent Plant believes that its tool is more interactive, and makes it easier to understand problems causing changes to the data, than other tools on the market.

The tool will also spot correlations in the data – which trends might be related.

“We said, let's put some intelligence in these trends,” Mr Aitken says.

The data is sourced from historian systems such as OSI Soft.



A better way to manage alarms? You can see if your alarm frequency is in an acceptable range

This trend data could be used by engineers – including process engineers and control engineers.

Any process plant

The software can be used with any process plant, although for the Aberdeen oil and gas industry, that means offshore platforms. The oil and gas industry is the company's main client base.

It can also be used in chemical plants, power plants, and wind farms, anywhere which uses plant.

It is used for both new and old plant. Many companies installing new plant assume that they will have adequate IT systems to monitor trends and alarms, but this is not the case, Mr Nicolson says. “The systems which come with new plant tend not to be so comprehensive.”

Typically with new plant, there is a “tick box” attitude to documentation, Mr Nicolson says. Companies say they want a system for tracking trends and managing alarms, and they receive one, but there hasn't been much consideration to how well it works.

One potential customer with a new offshore development project initially laughed at Intelligent Plant, because he thought he already had all the services, but revised his view after having a better understanding of what the company can offer, Mr Nicolson said.

Old software

Much of the software oil companies use to manage plant data is very old, Mr Aitken says.

When the software is upgraded, typically companies make add-ons to their existing software, rather than create software from scratch, so the old software is still there, he says. “New things are often old things re-badged.”

“Process technology tends to have roots in the past,” says Bruce Nicolson, Senior Control Systems Engineer with Intelligent Plant. “It is all built on something which is built on something.”

Software installation

The software can be installed on local computer systems or on cloud computer systems.

For example some oil and gas companies use Microsoft's Azure cloud service to handle operations data. They can install Intelligent Plant on their Azure cloud.

This means that company data is completely confidential once the system is running.

Intelligent Plant was in the first 25 companies globally which had a solution available on the Microsoft Azure Market place. This means that Microsoft Azure customers can install it on their own cloud hosting with a few clicks.

Many companies are still keen to keep all of the data hosted only on their own premises, but “that is tending to change,” Mr Aitken says. The economics of cloud hosting are becoming much more compelling.

Intelligent Plant also has its own cloud hosting subscription with Azure, which it uses to provide demonstrations of the software.

How process management systems can save accidents

As oil and gas companies look for ways to reduce costs and redevelop processes, should they be looking harder at process management systems – working out the best way to organise their processes and embedding this in a computer system?



Advocating Business Process Management for oil and gas - Donald Fisher, senior director, energy solutions, Software AG

Donald Fisher, Senior Director, Energy Solutions at Software AG, believes that business process management software tools might have prevented the Deepwater Horizon Disaster.

The investigations into the accident revealed several elements of process which could have been followed in a different way, or decisions which could have been routed to someone else for approval, which could have prevented the disaster.

But, would it be possible to develop software systems which could have done this, bearing in mind that every time a well is drilled, the processes are slightly different?

“There is a case where software would have helped in presenting some of the warnings,” he says.

“Those sort of indications could have alerted the management team that was making the decisions. “I think it is possible that we could have definitely helped from a safety point of view.”

Understanding business processes

A simple business process is when a business makes an order with a supplier, and then the supplier sends a confirmation and an expected delivery date. If the buyer doesn't get a confirmation of shipping, it can be followed up.

But of course, most business processes are much more complex than this.

In order to improve your business processes, the first step is to understand them – look at what you are doing now, and how it could be improved.

Software AG makes tools which help you to understand your business processes in depth, and then embed this into software.

For example, it can help you get a much better understanding of the logic behind ERP software such as SAP.

“SAP does not generally present a logical flow diagram associated with those processes,” he says. “Our software can look into an ERP system and discover what the processes are - and present them in a graphical view.”

Adding approvals in the process

The process tools can include areas where human approvals or decisions need to be made.

If the approval isn't made, the task doesn't continue, or it is routed to someone else.

So Mr Fisher's suggestion for Deepwater Horizon could be an approvals system, which would have forced additional oversight into the process.

A platform approach

Putting together a comprehensive digital strategy can be very complex, when you consider that drillers often use proprietary systems, and operators might want to have a view of what is happening over several different wells at once.

To bring the data together, Software AG advocates a 'platform' approach built up in layers, so you have an integration layer in the middle, which pulls in data from different systems.

Once the integration layer is in place, you can put analytics, alerting and visualisation on top of it.

For example, you could have analytics to work out of the operations of a well are different from what is expected, and give alerts to the relevant personnel.

Baker Hughes

For Baker Hughes, Software AG built a system to help the company produce better invoicing and improve cash flow.

As a service company, Baker Hughes produces a wide range of services, and the

billing for each of them is different. Any error in the invoicing will lead to delays in payment.

Baker Hughes undertook a project to redesign processes so that it could be more efficient. The work included creating and tracking key performance indicators associated with the invoicing.

As a result, the company estimated it was saving \$5 to \$6 on each invoice, Mr Fisher said.

Suncor

Suncor Energy uses Software AG tools for perhaps an easier process, on boarding of new employees, ensuring they all have a PC, an ID number and a telephone, all ready when the employee starts the first day.

Suncor has also used the software for supply chain management, and getting a better understanding of its SAP processes and where the bottlenecks are.

As the industry looks for ways to reduce costs, it is carefully evaluating how it operates, he says.

How do you implement it?

A business process management project often starts when a company makes a decision that it wants to improve the way that it operates, by implementing structured processes.

Usually some part of the company is given responsibility for “organisational process improvement” or “organisational excellence”, and will start looking for software which will support it, Mr Fisher says.

You might want to improve your processes for part of the company or a specific task (for example to reduce costs in exploration), or do it for the whole company at once.

Some companies have had bad experiences with business process management, but it is often because the company has tried to implement too many business processes at once. “It is virtually impossible to change all of your processes at once, one has to have a sort of strategy, what are my key processes,” Mr Fisher says.

IDS' new HTML5 user interface

Independent Data Services, a Singapore company which makes reporting software for the upstream segment (among other products) has developed a new user interface for interacting with its data, running on HTML5.

It replaces a previous Flash-based system.

The disadvantage of Flash is that it does not work on iPads. Also HTML5 is faster than Flash, says company director Douwe Franssens.

A HTML5 interface can run on any computer, tablet or phone without the need to install any software applications.

IDS develops web based reporting software, which is used by drillers, operators, service companies, rig contractors and EPC companies.

It integrates with many other software tools including ERP software and subsurface software.

IDS employs ~100 technical staff in Kuching, Malaysia.

Gathering data

IDS' reporting system can gather all of the data associated with operational performance (including how much drilling time was spent making it) and costs.

The data is entered "as close to the coal face as possible", Mr Franssens says, ideally being entered by the people actually doing the work.

"Data quality is about recording data when it happens," he says.

So, for example, a supervisor of a team of 10 welders can enter what they did or what happened (such as downtime due to weather) directly into the system.

Too often in engineering companies you end up with a 'Chinese whispers' type scenario where someone writes something on a notepad, hands it to a clerk, who enters it on a spreadsheet, and eventually no-one knows where the data is from, he says.

To encourage data entry at the site, you need to make sure the individuals involved have been persuaded that the data entry is needed, and it is as easy as possible to enter.

It is also important to make sure the questions are relevant. "Don't ask someone on an onshore rig for the thruster position," Mr Franssens says (thrusters are propellers used on offshore rigs for accurate manoeuvring). "If you drill with water based mud, don't ask about oil based mud."

"We work with clients to make sure the fields on the screen makes sense."

The work to configure data entry screens is not difficult, but the important thing is to go through the process of finding out what clients want, he says.

Customised software

IDS usually develops dashboards and reporting tools uniquely for each client, which are regularly updated, Mr Franssens says.

"I'm pretty sure there isn't a client in IDS who has the same version of the software another client has."

In one example, a drilling company was split into two, and very soon after the split, the two sections of the company asked for their own changes to the software.

For example, every drilling company has a 'daily drilling report', but all 200 of IDS clients have their report in a different structure. The daily drilling report is based on the International Association of Drilling Contractors (IADC) drilling report which was developed 30 years ago. The Daily Drilling Report and the IADC report are two different things, might want to remove or this sentence.

Even though the software is provided as a service over the internet (SaaS), it does not mean that the user has no control over it, he says.

"You can have 'adaptive SAS' where every client has their own version of the software."

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energy
journal

ShipServ - help you track quality of suppliers

Procurement information company ShipServ is developing services to help track the quality of suppliers for the offshore oil and gas industry.

The company gathers data on suppliers, including information provided by suppliers themselves about what they can do, and information from clients about their experiences.

The ShipServ system will show you which companies the supplier has done business with and who bought what. Buyers can also leave a score for the supplier, like on hotel advisory websites.

It is able to easily match suppliers with demands from buyers, if you need specific spares, stores, consumables or lubricants. This can be very useful for example if you

need a specific spare part for an old piece of equipment.

A further service ShipServ offers is to help you compare your spend with other companies. An individual company's spend is kept confidential, but you can see how your spending compares to other companies like yours.

Spend is categorised. For example for an offshore support vessel (OSV) you can see spend for deck stores, machinery, coatings, chemicals, provisions, cabins, special equipment, bridge, safety, lubes, engine room stores.

ShipServ provides this service to 14 offshore supply vessel operators, including Bibby Ship Management, DOF, ER Offshore, Eidesvik, Hornbeck Offshore, Maersk Supply Service, Rem Offshore, RK Offshore Management, SeaCor Marine, Siem, Solstad Shipping, Vroon Ship Management and Vroon Offshore Services.

It also provides this service to 3 offshore drilling companies – BKE Shelf, EMAS AMC and Maersk Drilling.

The company has been collecting data for 15 years.

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journal

Brightsolid - new Aberdeen data centre

Cloud computing company Brightsolid has opened a public data centre in Aberdeen on October 1, with a £5m investment.



Setting up a cloud computing centre in Aberdeen - Alan Matthew, business development manager, Brightsolid

Oil and gas companies can use the data centre to avoid the trouble of running their own. They can install their own computer servers on Brightsolid's premises, or use Brightsolid's computers.

Brightsolid was previously operating data centres in Dundee and Edinburgh, mainly serving the banking industry and government.

"Oil and gas people were saying, we like what you've done, but would like it more if it was in Aberdeen," says Alan Matthew, business development manager with Brightsolid.

"I've never had customers as interested in any product as 35 years as a salesperson," he says.

Services like this could work for geoscience

software, where you could install powerful computers in the Brightsolid centre (perhaps with GPUs rather than CPUs), and your geoscientists would just receive a video image to their PCs (as described in the previous issue of Digital Energy Journal).

Most oil and gas companies are on a gradual path towards cloud adoption, he says. Companies don't generally want to make a sudden move to stop running their own infrastructure.

However companies are less scared of the cloud than they have been in the past, he said, partly due to their experience working with cloud software in their personal lives. "People know iTunes doesn't live on your phone, he said.

Brightsolid also provides services to a number of satellite communications companies, including Rignet and Caprock, storing data which is sent from offshore by satellite.

Brightsolid is also offering services to software companies who want to provide hosted software ('software as a service'). By providing cloud hosted software, it is possible to set up a software company with a much lower number of personnel, such as just 10 people

in the company.

The data centre

The Aberdeen data centre is located at the premises of newspaper Aberdeen Press and Journal, because both Brightsolid and the Aberdeen Press and Journal have the same parent company, DC Thomson. DC Thomson is the owner of a number of big websites including Friends Reunited, and originally built data centres for its own websites.

The site is 2200m². It has 217 high density racks with capacity of 25kW per rack. The power usage efficiency is similar to the highest performing of Google or Amazon data centres, Brightsolid says.

For physical security, the data centre is stored in a 'building within a building'.

The data centre is 'Tier 3', which means it confirms to current best practise in how data centres should be run, Mr Matthew says. It is open 24 hours a day, audited for security, has a back-up power supply and a mix of communications routes. Data is backed up to the Dundee data centre, via a 10GB fibre optic link.



Archer - developing modular drilling rigs

Oilfield services company Archer is employing harsh environment modular drilling rigs (MDRs) for offshore platforms, which split into modules of less than 12 tonnes.



Promoting modular drilling rigs for the North Sea - Kevin Cowieson, business development manager, Archer

This means they can be transported to and installed upon offshore platforms without requiring heavy lift vessels.

The MDRs are primarily designed for cased hole drilling, well intervention, workovers and plug and abandonment operations (isolating old wells and recovering spent tubulars and casings). They can also be used for drilling new wells.

The MDRs are particularly suitable for ap-

plications where the existing platform drilling rig (if there is one) requires significant reactivation or investment due to either age or prolonged idle periods in a harsh offshore environment.

Choice of rig

If an operator wants to drill new wells or carry out intervention on old wells beneath an existing offshore fixed installation, and the existing platform drilling rig has not been used for a long time or is in a state of disrepair, there aren't many options.

The platform operator has a choice of reactivating the existing rig, bringing in a mobile offshore drilling rig alongside the platform (such as a jack-up rig), or installing a new drilling rig on the platform (such as a modular rig provided by Archer).

Costs for this reactivation activity in mature

regions such as the North Sea have spiralled in recent years, as many platforms are more than 25 years old. In some cases, recent reactivation costs have exceeded £25m, says Kevin Cowieson, Business Development Manager with Archer. There can also be problems with obsolete components and scope changes due to unexpected issues, which have a major influence on cost and project timelines.

A jack-up rig can only be used alongside a platform if the water is shallow enough and the seabed conditions are suitable. In addition, the layout of platform structures can prevent it from reaching all of the well slots. For deeper waters, heavy duty jack-up rigs with upwards of 400ft water depth capability can be extremely expensive.

So building a temporary drilling rig on the platform, such as Archer's MDR, could prove a very cost-effective option.

The MDR rates are generally 40 per cent or more lower than the cost of drilling with a jack-up, Mr Cowieson estimates.

The modular rig

Archer's service model is to build, lease and operate the MDRs, charging by the day. The rig is entirely automated, with no personnel required on the rig floor in normal operating modes.

It can be run with a crew of as few as 16 people on a 24-hour basis. But Archer typically sends a crew of 21 to the platform to ensure maximum operational efficiency. Much of the technology in the Archer MDR was originally developed for onshore use. However, Archer - in cooperation with its manufacturing partner - sourced, replaced or optimised the equipment to both withstand and comply with offshore harsh environment operations.

The rig has an alternative tubular conveyance system compared with traditional units. It is a rack and pinion system, which moves the drilling tubulars in and out of the well, rather than a traditional draw works and drill-line system. Statistics show that this technology has a very good performance and safety record.

In designing the MDR, Archer set a weight limit of 12 tonnes. This is a weight that can be transported on a standard offshore support vessel, negating the need for expensive heavy lift vessels. In most cases, it can be lifted onto the platform with a standard offshore platform crane. If required, a modular platform crane can also be deployed.

New Zealand and Norway

In 2012, the first contract was agreed to install one of Archer's MDRs on Shell Todd

Oil Services Limited "Maui A" platform, located in the Tasman Sea off the coast of New Zealand. Between 2012 and 2014, the Archer Emerald drilled a series of wells, with the longest - "Adi-Thi" - being 6.6km, a record for New Zealand from a fixed (non-floating) installation.

The second contract is on Statoil's Heimdal platform offshore Stavanger. The rig was built to order for this contract.

The rig was delivered to the platform in 11 platform supply vessel sailings over 37 days. The rig-up time was lengthened due to bedding constraints on nightshift. Normally, construction can be achieved in three to four weeks, or quicker if there is sufficient bed space and a large capacity platform crane. As of September 18th 2015, the rig had completed 11 wells and was 55 days ahead of schedule

digital
energy
JOURNAL

VOR - a new model for energy logistics

Logistics company Peterson has developed a supply chain management tool called VOR, in partnership with Glasgow-based software company Streamba.

It is an interactive logistics tool which allows oil companies and their suppliers to upload data relevant to their supply chain operations.

VOR can give them a real time overview of where everything is at any time, including warehouses, vessels, pallets, helicopters, containers and trucks. The data can then be made available to other companies.

"We have ambitions for VOR to become the Google of the energy supply chain," says Steve Calder, managing director of Streamba.

The software uses real time traffic information, helping to estimate journey times.

"Operators and suppliers can see their logistics on a map and there are tools to share photos of the vessels being loaded, allowing

insight into available space," he says.

"Other benefits include purchase and expenditure and journey history data and real-time updates like journey delays."

Vessel share

Peterson has a long established track record in providing industry-leading vessel sharing initiatives, including the successful Southern North Sea (SNS) Pool, an integrated fourth party logistics concept where nine operators outsourced their combined marine and helicopter requirements to one logistics facilitator.

Peterson has been managing the system for almost 15 years from Den Helder, maximizing efficiency by combining volumes, distance and capacity, safety by setting

minimum standards and minimising environmental harm by reducing sailing and flying distances.

The firm supports vessel sharing in both Den Helder and Aberdeen and is at an advance stage in managing arrangements between two major operators in the Northern North Sea.

In Aberdeen it is part of the Aberdeen Marine Logistics Alliance (AMLA), established in 1996 and now has 30 members. Peterson helps identify where cargo space can be shared, and also charters vessels on behalf of the alliance, making it the second largest vessel charterer in Aberdeen.

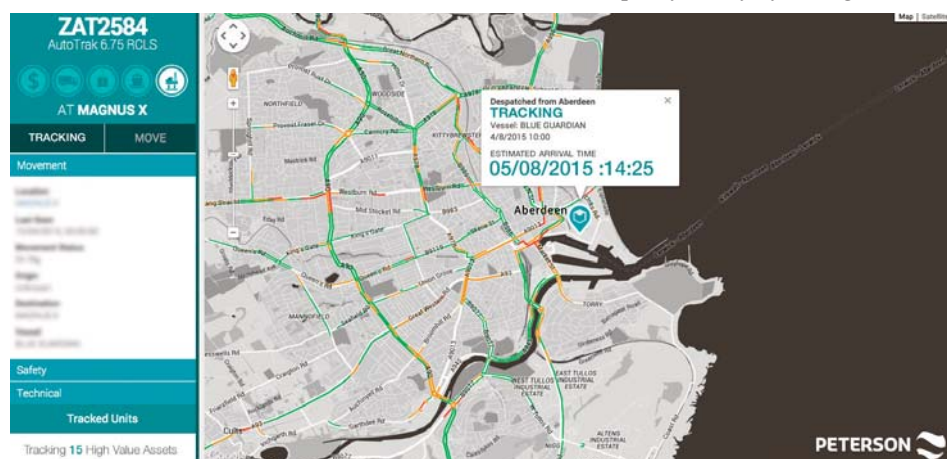
eCargo

Peterson has also developed a new software application called 'eCargo', a workflow based system to help manage quayside operations.

It replaces a management system based on spreadsheets. The development work was by Aberdeen company Core29.

Using eCargo, oil companies sending goods offshore can enter their cargo manifests (lists of items they want to transport) directly into the software, rather than e-mailing a spreadsheet.

It covers all areas of quayside from customer input, cargo inspection and loading and discharging of vessels.



A better way to manage logistics? Peterson's VOR

Visco - great graphics from your models

Visco, a company based in Stavanger, Norway, has worked out ways to develop impressive graphics based on data in CAD (computer aided design) models.

The company calls it “industrial visualisation.” Clients include Shell, Statoil, FMC, Aker Solutions, Siemens, Kongsberg, and ENI.

It recently completed a visualisation for an oil and gas separator delivered to Petrobras to work in 2000m of water, and another animation for turning a remote operated vehicle (ROV) into a root.

The graphics can be used to make company videos, PowerPoints and brochures. They

can be used for education as well as sales. They can also be used for discussions with customers, to select a product configuration.

“It’s a new way of thinking instead of boring PowerPoints,” says Odd Solberg, vice president and director of VISCO.

VISCO both builds the software and provides the service, working with CAD (computer aided design) files which are supplied by the customer. It can work with any kind of CAD file.

It produced the interactive graphics for oil and gas equipment company FMC, which proved a big attraction on the company’s exhibition stand at Offshore Europe.

To develop the visualisations, VISCO will work together with the customer to ‘build a story’ around what they do, Mr Solberg says.

The website www.visco.no has plenty of examples of what can be achieved.



Intergraph - helping manage unstructured information

Engineering software company Intergraph Process, Power & Marine (PP&M), is helping oil and gas companies manage unstructured information with its Intergraph SmartPlant Fusion solution

Engineering software company Intergraph is helping oil and gas companies get a better understanding of their unstructured plant data with its SmartPlant Fusion software solution.

The software can be used to find, capture, organise and link large volumes of engineering data, providing a single point of access to information.

“It is common for plants or offshore platforms and projects to have their data in many different drawings, documents, models, lists and data sheets. These are all in different formats and usually scattered around in the organization on various locations and systems, which is very difficult to work with”, says Sascha Antvogel, manager of global business development at Intergraph PP&M.

SmartPlant Fusion can be used by asset managers, maintenance managers, and engineering companies.

A recent survey conducted by Intergraph, executed together with TechValidate, has shown that, on average, 40 per cent of plant information is unstructured, Intergraph says. This leads to the people working on unstructured information spending over 20 per cent of their time validating information, Mr Antvogel says.

In the same survey conducted in the oil and gas and chemical sector, only 39 percent of respondents said they were completely confident they could find information in emergency cases.



Helping you work with unstructured plant data - Sascha Antvogel, manager of global business development at Intergraph PP&M

Benefits

“The software enables people to make better decisions with more accurate information,” Mr Antvogel says.

“You can be less reliant on data stored in people’s heads, and make the information accessible for the whole organization.”

Another useful SmartPlant Fusion feature is the capability to compare different documents, showing up where they differ. This enables users to easily differentiate between ‘master’ versions and duplicates. It is common for companies to end up with many different versions of the same document and not know which one they should be using.

SmartPlant Fusion also allows you to integrate Leica TruView HDS information created from laser scans taken of a facility. A user can search for a tag and see it in the TruView image, as well as search for all other documents and drawings that contain the same tag.

Photo realistic comparison can be done between the current condition of the facility in the TruView to identify the possible differences between the existing data and the current used documents. This enables the users to have the latest information available in all formats.

The SmartPlant Fusion software allows you to track the status of data and document completeness against a set of predefined criteria. When taking over a new asset, the owner operator can run all the documentation through SmartPlant Fusion to identify if all the necessary documentation has been provided.

An example of an application of SmartPlant Fusion is one current client using the software to gather all the information about an asset to a single location, which can be made available to customers

Easy implementation

“Most companies already see the value of such a system, as trustworthy engineering data and documentation is essential to both effective project delivery and safe, efficient operations. The challenge is to convince the project managers to get started with building up the system,” Mr. Antvogel says.

“The easier a system is to build, the easier it is to persuade people to use it.”

“We see our clients dramatically reducing the time and effort required to find and validate engineering documents in only few months after implementation,” he says.



Steljes - the benefit of 'concurrent' work

One of the biggest benefits of remote whiteboards is that two people in different places can look at the same content as they discuss it – which can be much more efficient than e-mailing screenshots, says Steljes

Many oil and gas companies are starting to see big benefits from using remote whiteboarding, where people on two different sites both look at the same digital 'whiteboard', or writeable screen, says Russell Taylor, sales manager Scotland with Steljes, a company which develops the technology.

The technology can be used together with all of your existing software, but it is a way to show your colleagues what you are currently working on, and, if you feel like it, write all over the screen with a digital pen, or write notes, which can be shared and automatically kept.

The technology is not new, but companies are starting to get a much better understanding of the benefits of it.

The main benefit turns out to be simply that people can both look at the same content at the same time, Mr Taylor says.

Much oil and gas work is visual, for example when someone draws on a technical drawing with a pen about a part which needs to be removed.

There are big benefits from two experts looking and discussing the same content at the same time, rather than sending each other e-mails, Mr Taylor says.

Think of when you have a problem and you e-mail a screenshot of the software to a colleague. The colleague e-mails back what he thinks is happening. You might think, that sounds ridiculous, or send some other reply. At some point you have a phone call. You reach a conclusion but it might take the whole day.

But if you are working concurrently on the same information, you can talk about it together and look at it together, and reach a common understanding in a few minutes, he says.

"Sending an email and phoning afterwards isn't really collaboration," he says. "The key word is concurrent."

When the system is installed, companies will often tend to have many short group discussions during the day, even if they are based in different locations, rather than blocking chunks of time off for a longer meeting, which can take a while to arrange.



Using large "SMART Boards" to share content with others

Typically an oil company will have an engineer working offshore trained to a certain level, and a more experienced engineer working in the head office.

If there is a bigger problem, they will sometimes send the experienced engineer out to the rig. But with whiteboard technology there's less need to do that.

The digital whiteboarding turns out to be a much more useful technology than video-conferencing for business communications, Mr Taylor says.

Video conferencing might be great for talking to your family, but in business, people spend most time in meetings discussing content, so it would be more useful to the content rather than the faces, he says.

Steljes technology

The 'whiteboards' are actually very large ultra-high resolution touch screens. The same image can be seen on another 'whiteboard' in a remote office.

You can write on a 'whiteboard' with an electronic pen, or put an image from your PC onto it.

If you want to keep what you have written, with a few clicks you can download it to your computer as an image file.

Having a large high resolution screen is very good for looking at drawings of geological models. You can view a photo of a core sample on the screen, and see as much data as if you were looking at the actual core sample,

he says.

Tullow

Steljes' interactive whiteboards were used by UK oil company Tullow Oil, to support collaboration between different disciplines, to find ways to improve oil and gas production.

Tullow developed a system called 'Technology Assisted Production', to gather, process and communicate production data, so engineers do not have to do data management work themselves.

Oil production operations involve many different people - geologists, production technologist, reservoir engineers, process engineers and well engineers.

Tullow uses the Steljes SMART boards to enable representatives from all of the disciplines to virtually sit in one room and show each other the same data, and have an informed joint discussion.

The SMART Board is in Tullow's Accra office, with real time local oil production data, and used by the multidisciplinary team in Accra, connecting with the Tullow's Well Engineering Team using SMART BRidgit data conferencing software.

"It was previously very difficult to get all the engineers together. It required a formal process just to arrange the meeting, which might happen once a month, and these meetings were not interactive; people spoke then left," says Murtaza Amin is the Production Technology Team Lead, based in Tullow Oil's main office in Accra, Ghana.

"Now that all the data comes in one room, our engineers come together automatically every day without formal meetings."

Engineers can view and share data, annotate, manipulate and write on the display, and save and share the results.

This leads to big reductions in travel time including travelling offshore.

The company expects to achieve improvements in well uptime from using the system, by being able to spot problems earlier. Typical well uptime is 95 to 98 per cent, but there are large costs associated with the 3-5 per cent downtime.

ABB - cut costs in 100 days

Automation, power and consulting company ABB has developed a '100 day challenge' program for oil and gas companies, to help them identify ways to cut costs in 100 days, and make the required organisational changes.

It is often not difficult to work out where costs can be cut, for example if your planned maintenance system requires you to do a maintenance task on an item of equipment which might not need the maintenance right now.

But there are usually organisational reasons why it is difficult to make the change, for example, it might be thought to put a small additional risk on someone's desk, and no-one wants to accept this risk.

This can be overcome by evaluating the risk or making a company decision that the risk is acceptable, but this creates more work, which is at a lower priority to day to day demands.



Showing how to reduce operational expenditure by 2 to 2.5 per cent - Dai Richards, global marketing manager, ABB Consulting

To overcome the organisational challenges, ABB suggests that the company commits to a concentrated effort over 100 days to try to cut costs, to try to keep the focus at the top of people's priority lists, rather than the bottom.

Typically the study will identify ways that overall operational expenditure can be reduced by 2 to 2.5 per cent, and bed space freed up for people working on other tasks, says Dai Richards, global marketing manager of ABB Consulting.

Usually companies pick one or two topics they want to focus on, as part of their 100 day challenge, he says.

Inspection and maintenance

One of the easiest ways to reduce costs is look for inspections or maintenance which is being carried out more frequently than is necessary, Mr Richards says. You can argue that unnecessary inspections

can increase risk more than they reduce it, since doing an inspection can often require a shut-down of production, leading to other hazards, he says.

Vessel inspections can be hazardous, if they require someone to go inside and crawl around. There are NDT inspection techniques which can do the job better and safer.

Many companies could benefit from more use of non-invasive testing techniques such as ultrasonic testing, says Andy Hollins, principal consultant with ABB.

85 per cent of pressure vessel inspections are usually done by sending someone inside them, which means shutting them down and emptying them.

"We've looked at 700 vessels on platforms, 60 per cent are now inspected with non-invasive inspection," he says.

Pressure safety valves are often tested much more frequently than they need to be.



Shutting an off-shore platform for annual maintenance may not be necessary - Andy Hollins, principal consultant, ABB

ABB has a methodology to determine optimum time to inspect safety valves. When used by the company's clients, it suggested increasing inspection intervals for 70 per cent of valves and reducing them for 8 per cent of valves. The average inspection interval increased from 48 months to 62.

When it comes to maintenance, consider that shutting down a plant completely for annual maintenance may not be necessary. Some chemical plants can operate for 5-6 years without being shut down.

Analysing failure

You can also optimise your maintenance plan by getting a better understanding of why failures occur, says Mr Hollins.

Figures show that 48 per cent of production losses are due to plant equipment failure, and 14 per cent of plant equipment failures are due to problems with compressor trains. This gives you a good idea what to focus on.

Some compressors are so unreliable that their running time between outages is recorded in days.

Our work with another operator revealed that the weakest link in its systems were lube oil and sealing systems, Mr Hollins says.

Removing equipment

Another way to reduce costs is to remove equipment you are no longer using, Mr Richards says. Many platforms have old equipment which is regularly maintained, but which no-one ever plans to use again.

You still need to be able to argue that your risk is 'As Low as Reasonably Practical' which might sound difficult when you are proposing maintaining equipment less often. But you can do it if you can show you are not changing the risk, or perhaps reducing the risk, since maintenance itself can cause problems.

Organisational problems

A common occurrence when attempting organisational changes like this is that a senior manager will put his support behind a change, but the middle management resist it, and tell junior staff to ignore it, Mr Richards says.

Often, the middle management have designed the current systems, and believe that the maintenance intervals in them are correct.

People think they are already doing the right thing," he says. "If you've always lived in a regime where you shut down a platform every 12 months [for maintenance] it's difficult to change."

DNV GL - rebuilding mutual trust and lowering costs

Perhaps the easiest way for oil companies to cut costs is to collaborate with other companies more – which might mean rebuilding mutual trust, says DNV GL



'It's easier for people to work together when they trust each other' - Hari Vamadevan, VP and regional manager for UK and Sub Saharan Africa with DNV GL.

"It's easier for people to work together when they trust each other," says Hari Vamadevan, VP and regional manager for UK and Sub Saharan Africa with DNV GL.

Trust is particularly important when we are in a difficult time where people need to "challenge the norm," he says. "We don't carry on doing business the same as before."

The usual cost reduction step is for oil companies to ask for a lower price – in which case they can get a 5, maybe 10, 15 per cent reduction, he says.

But if you want to find a new way of doing things, you need a different conversation. "You need to challenge the basic way it's done," he says. "Collaboration is the heart of it."

In many areas, companies have not challenged the way they work in the past, and have tried to solve problems by throwing more money at them. This approach won't work this time.

Some oil companies are already trying to start opening up different conversations with suppliers, including BP (see article on speech by Bernard Looney on page 2).

Often suppliers know when there is a better

way to do something, but they are not asked.

Take a step back

A big challenge is that most people are "so busy executing. As an industry we run very hard and very fast," Mr Vamadevan says.

In order to find better solutions "you've got to take a step back".

In order to make costs lower than revenues, "we need to do 100 things better, rather than do one thing [better]," he said.

There are often interesting solutions which are not being considered, such as shipping gas from a well directly in a compressed natural gas (CNG) vessel, if it is not easy to connect to an existing platform and gas reception facility.

DNV GL can provide a critical role in these cost pressured times, verifying that any changes made to reduce expenditure do not impact safety.

Joint industry projects

Altogether DNV GL has over 100 joint industry projects running, of which 30 are focussed on cost.

DNV GL spends 5% of its turnover in research and development, and the company believes that one of the best ways to spend that money is in encouraging industry collaboration on joint projects, often to develop standards. It typically asks companies participating in the JIP to match its investment.

It is useful to have a joint industry project to

work out how to reduce the number of documents. Their numbers are massively escalating.

Take this example from a typical contractor to see how an explosion in documentation over the past few two to three years has driven up cost.

"A typical subsea project would deliver between 5,000 and 10,000 documents but each one has an average of 3 revisions so end up with 30,000 transactions between two parties. Now projects we are at 30,000 documents x 3 revisions as an average - documentation scope has increased by two thirds. Mr Vamadevan says "If we could reduce the documents by a quarter or a half, that's hundreds of thousands of man hours."

DNV GL has also put together a Joint Industry Project with 21 companies, to develop a recommended practise for steel forgings for subsea, covering qualification, manufacturing and testing of carbon and low alloy steel forgings (ie forcing the steel into shape).

This will make it possible to make a more accurate selection of choice of steel and the method of shaping it, taking both safety and cost into consideration.

Decommissioning is another area where there could be many useful joint industry projects. There are many challenges including understanding risk, maintaining safety, managing marine issues and verification (checking everything has been done correctly), all areas where DNV GL has a strong position.

DNV GL can help companies work out complex decisions about balancing risk and cost effectiveness.

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