Finding Petroleum

- How to develop a digital twin
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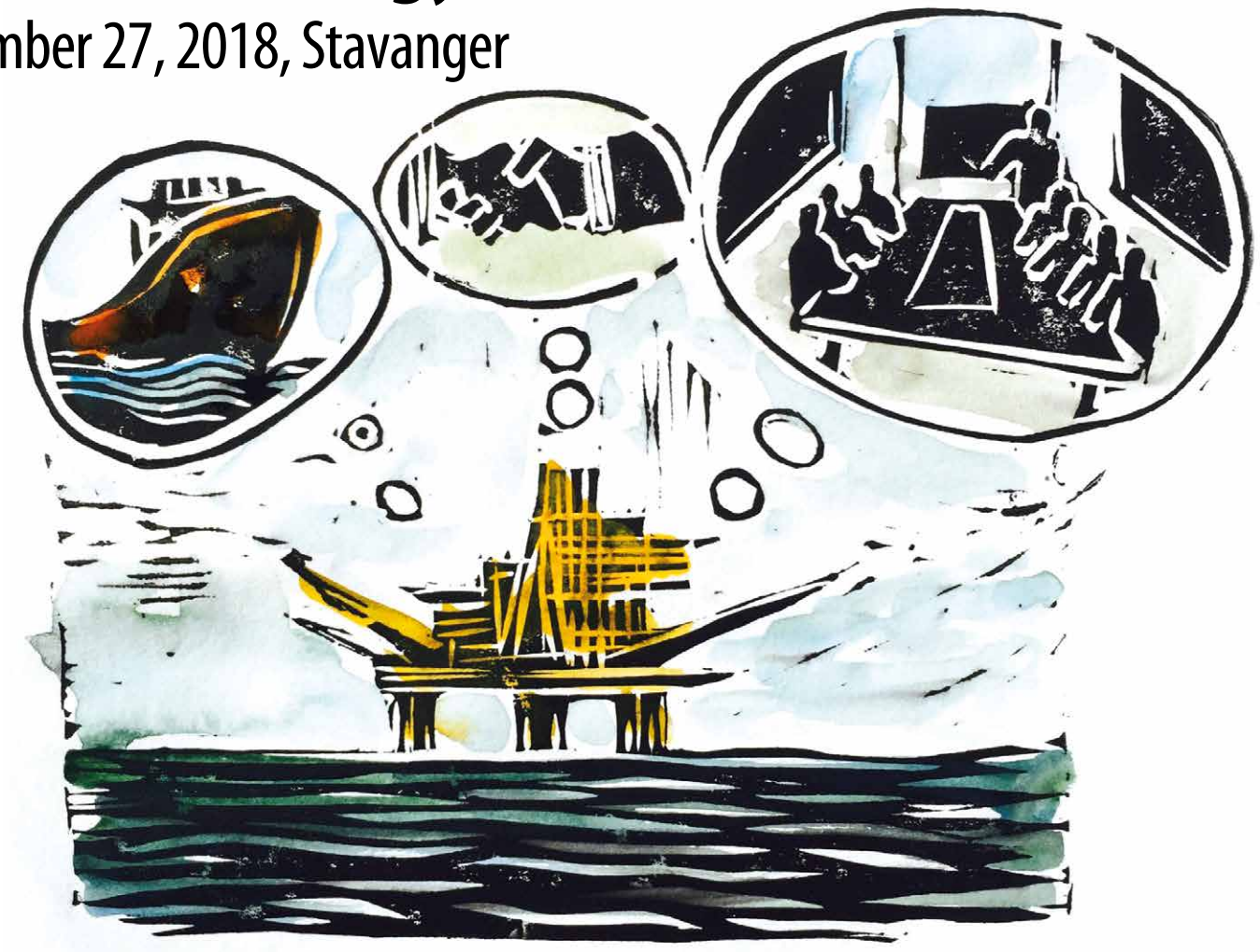
- Monitoring equipment health with software
- Documents in a real world 'context'
- With talks from Hexagon, Siemens, CGI, NOV and IntOp

Special report

Understanding offshore operations with digital technology

November 27, 2018, Stavanger



Stavanger - making better use of digital technology in operations

Our Finding Petroleum Stavanger forum on Nov 27 discussed how companies are making better use of digital technology in oil and gas operations – including better approaches to the digital twin, making better choices about what digital technology to adopt, making predictive maintenance make returns, and improving access to company documents.

Hexagon and Siemens talked about how to build or evolve a digital twin, and what the term actually means. CGI talked about how your company should find the right path forward of where it wants to go with digital, taking into account the various perspectives in the company.

NOV talked about how to make predictive analytics work, looking at the company's drilling equipment. IntOp talked about the company's work building 'contexts' around a client's documents, so they can appear in a browser in a logical structure, no matter how they are actually stored or organised on the disk drives.

This is a report from the the Understanding offshore operations with digital technology event - November 27, 2018, Stavanger

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Note:
Some of the slides and videos from this event can be downloaded free from the Finding Petroleum website event page
www.findingpetroleum.com/event/49001.aspx

Hexagon – how to develop a digital twin

People interpret the term 'digital twin' in many different ways, but as a minimum it just means having your data and documentation describing the configuration of an asset available in a structured way, explained Adrian Park from Hexagon. There is today great focus on digital twins as they are a cornerstone to enable digital transformation of organizations.

The term 'digital twin' just means a virtual representation of the physical asset. It does not necessarily include 3D models and sophisticated data, it could just mean all of the data and documentation you have for the asset available in a structured way, said Adrian Park, VP information management, Hexagon Process, Power and Marine (formerly Intergraph).

It can include (for example) just the basic configuration of the asset, information about changes made to it, and information from transactional operations systems about maintenance and inspections. It can be augmented by real time sensor and data historians.

Adrian Park VP information management, Hexagon Process, Power and Marine (formerly Intergraph).

People need to take care with their ambition level. If you want a digital twin with monitoring for every significant piece of equipment on the facility, it may take 10 years to build, he said. You probably don't want to end up with a 10 year project.

A few years ago oil companies might be happy to embark on 4 year projects, he said, but today they are typically looking for software paybacks within 12-18 months. There is also less willingness today to pay for software development or configuration, oil companies want it to work fast and out of the box.

One of the biggest benefits of a digital twin, clients say, comes from having a single reference source for data about a facility, which can be used by everybody in the organisation and external suppliers to support faster and better decision making. If the information is accurate and up to date, it can make it easier to plan maintenance or equipment alterations. It can also help with compliance and safety. They also say that having a digital twin helps manage data quality, consistency and change management, he said.

A common way to design the user interface is to present the digital twin as a map of all your information, including documents, maintenance information and 3D models. You can click on different pieces of information and bring lists of further available information.

For example, you click on a valve and see a list of available documents related to a valve. Or you click on an engineering model (for example of an FPSO) and then the model comes up, which you can then explore accessing engineering data, documents and real-time information with a single click. Everything is accessed via a zero-footprint web browser with no software or plug-in installation needed. Information is available anytime, anywhere on any device.

Building it for greenfield

If you are building a digital twin on a greenfield (new) project, it would ideally be incrementally built during the project from all the documents generated in the design and construction process.

The data needs to be integrated together, which can be difficult work considering that all the data is arriving at different times during the construction process.

The costs of data handover, from the engineering / construction company to the operator, have been estimated at 2-4 per cent of the total investment cost for a large project, an enormous amount of money when the total cost runs into billions of dollars.

If all the data is cloud hosted, it can be passed onto the operator at the same time as the physical facility is handed over, just by giving the operator the logins to access the data. If an operator identifies changes they require to the data before formally accepting it, they can pass it back onto the contractor, he said.

If there are gaps in the data at handover time, it can lead to problems as the operator gets the facility onstream, which can lead to expensive delays.

To try to prevent this, USPI inn the Netherlands and ENAA in Japan together with a group of companies are developing a data handover standard called CFIHOS (Capital Facilities Handover Specification) to specify exactly what data and documents are needed for operations and assess whether or not the data is complete.

Hexagon has declared its HxGN SDx® digital twin to be "compliant with CFIHOS", the first vendor to formally do this.

Hexagon has written a document with guidelines about how to provide information according to CFIHOS and how to execute a project. It is available free of charge.

Brownfield

If you are building a digital twin for a brownfield asset, the challenge is gathering and integrating all the data you have about the asset around the company – typically multiple ad hoc databases and unstructured document files.

To assist with this process, Hexagon has developed technology which can 'crawl' the documents on a network and try to work out the relationship between them. It can assist identification of the master documents where duplicates exist, and which CAD drawings, PDF files and spreadsheets relate to which item. The data can then be browsed as a cohesive set.

You can use the software to make a "validation report", for example looking through a tag register provided by a vendor, to identify which documents appear to be missing, and what remediation might be necessary.

For older assets, it is unlikely that you have a 3D model or detailed diagrams to begin with, so you might want to do a laser scan to build a 3D representation of the facility.

The cost of laser scanning has much reduced in recent years, and it is "relatively fast and simple" to do. To get value from the laser scan, you need to put "intelligence" into it, or connect it to the data. That work typically costs 5 to 10 times as much as the data scanning itself. "That is rather the barrier to people adopting laser scans in an intelligent way," he said.

Hexagon is looking for ways to use artificial intelligence to identify specific objects on laser scans, which can then be connected to objects or 'tags' in the database. It is proving possible to identify a valve or pump on a laser scan. It is possible to identify valves and pumps on a P&ID.

Connecting a specific valve on a laser scan to a specific valve on a P&ID is harder. Probably it can't be completely automatic, but it might be possible in a semi-automated way, giving a human expert candidates to choose from, so it is faster for people to do.

"That's what we're working on now. It will probably take us another year before we know if this is feasible," he said. "If we manage this, it will be a major breakthrough, to how we adopt laser scans going forward."

Hexagon has a standardised methodology for working with customers, where it starts with an assessment of what the customer has, and does some structured interviews, and then gradually builds the model.

Integrating information

The digital twin software will need to integrate with other corporate IT systems, such as maintenance management systems, control systems, historians and asset reliability systems, and the large number of databases and spreadsheets companies use.

Hexagon helps customers understand their data by working on a consultative basis. For example, it might help the company recognise that technicians in their day to day work need to consult 25 or more different, frequently inconsistent sources of information. When senior management see this, they realise why it is taking people so long to find the information they need. And then the next step can be to consolidate the data into a digital twin, and integrate it directly into enterprise systems which work with the data.

Hexagon has put a lot of investment in building web standard APIs, so its software can be connected to other software via the internet. There are also "out of the box" interfaces with SAP and OSISOFT, probably Maximo will be next, he said.

"We can build interfaces with external systems in a matter of days or weeks which would have taken us many months in the past," he said.

This means it is possible for a digital twin to be automatically enriched with information from other systems, and also make the digital twin data available to more people in the company. For example, the digital twin can access real time data from the OSI PI data historian. It can also provide equipment data to someone who is working directly with OSI PI. The integration is seamless so it not obvious the data is coming from an external system.

Another integration example is connecting a control of work software to the digital twin, so someone searching for a valve in the digital twin can see what work is planned to be done on it.

You could also create work permits in the control of work software when you working with the digital twin.

A common use case for software integration is people working with a digital twin who want to see real time data in support of it, so they can see the trends in sensor data, he said. Another common interoperability case is between the maintenance management system and the asset engineering digital twin.

The data integration is usually through real-time synchronization of key data between the digital twin and operations systems with look-up between systems on demand for display and analysis rather than continuous data consolidation into a single common database. Continuous data integration could be very difficult technically, with data historians handling data input thousands of times a second, which a digital twin is not designed to handle.

Digital twins take effort to build but are a necessary foundation to enable transformative changes in business efficiencies and break down silos within and between organizations in the value chain for oil and gas companies.

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CGI – finding your digitalisation path

With so much digital technology on offer, companies need to think much harder about where they actually want to go with digitalisation. It is better if you develop a strategy covering the whole business, said Karin Corbie, Senior Consultant, Service Management, with CGI.

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The company, in their 2018 Client Global Insights Industry report, surveyed its oil and gas customers, and found that only a quarter said they had a digital strategy covering their whole business, and only 20 per cent of customers had a wider "holistic" strategy which incorporated their customers.

You don't necessarily need to manage large and complex projects to get value from digital technology, but you do have to focus on where the value is going to come from, she said.

Companies need to find a way to determine their biggest business objectives for what they want to achieve with digital technology. Then they need to decide which specific technologies they want to use, and how they want to implement them, she said.

Nearly every company is installing new technologies and sensors, developing mobile apps, putting software in the cloud and doing analytics. But they are not necessarily doing the most possible with the data they have, and many companies are drowning in information.

Organising data projects is getting very hard. "The more you look at the data you have, the more difficult it is to figure out what to measure, what to explore, where to take your digital initiatives," she said. "Lots of organisations have several teams all over the business. Many people are repeating the tasks with the same data."

A common starting point can be to look at better ways of using business data, she said. This can lead to ways to reduce costs, develop market offerings faster, and make faster improvements.

Many companies are already using analytics and business intelligence tools, such as "Power BI", she said. But when they want to get beyond business data, doing analytics on operational data, they find that they need to improve data quality and availability.

Karin Corbie, Senior Consultant, Service Management, with GCI

Often there can be a gap in companies between the digital specialists and everybody else, who start to think that the digital specialists are just trying to "chase buzzwords" rather than actually improve performance, she said. These problems can be resolved by running workshops, so long as the relevant people are involved and talking to each other.

Another common problem is that the new technologies are too difficult to adopt, which, perhaps unsurprisingly, proves to be a major barrier in achieving adoption.

Roadmap

When putting your digitalisation roadmap together, a first question to try to resolve is what business value you are looking to achieve with your digital projects.

For example you might want to improve safety, get better at attracting and retaining customers, understand customers better, improve your supply chain / logistics, provide better support to customers using data, provide data as a service, and better understand your business from end to end.

You can start by figuring out what data you have now, what data you need, and if the data is clean. You can consider what software tools you need. Also who the target audience is for the project, and whether they will appreciate the value.

A next step is gathering together people who are involved with it, and generating ideas about how to move forward, perhaps in a workshop setting, perhaps with outside experts involved.

You want a shared understanding of why the company is doing this digitalisation project, and then set a baseline for how you will measure the value of it, she said. And you need to work out if you have a pathway which will lead to the results that you need for the project to be worthwhile.

Companies typically start by trying to understand the past, such as investigating incidents and understanding problems, pulling historical data from different tools. But as the maturity level increases, the focus moves to predictive capability, trying to figure out what will happen and how to change the outcomes, "instead of looking backwards". This also requires a good data quality, or "a level of maturity in your data", she said.

Usually you have an iterative process, starting off with projects you think are quick and easy to implement, and trying them out, then deciding whether to make it bigger or to stop.

The whole process could be considered "use case prioritisation and road mapping", deciding which path gives you the most value and how to get there.

Customer example

CGI helped one customer with an internal "digitisation roadmap" writing process. It involved doing trial projects including taking a sample of data, inviting key stakeholders, having a 3 day "brainstorming discussion" about desired outcomes, what unique value the project will provide, and coming up with some technology ideas.

It was a process of exploration, debate, buy-in, finding something which could be improved with digital tools, she said.

One idea which "conceptualised very quickly" was a bot that could do image recognition. There were also some dashboards developed. There was a discussion about building a data lake, so data could be looked at from different angles, and more easily shared.

Siemens – digital twins can support decision making

A 'digital twin' can support better decision making, by providing better information quickly, explained Nigel Sams, business development and sales manager oil and gas with Siemens Digital Industries

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A typical "digital portal" for an asset (such as a piece of equipment or facility) can show a quick "healthcheck" view and your key performance indicators. There can be an ability to drill down to better understand any emerging problems.

It can help the operator understand how the plant is being operated, for example checking that parameters are within safe operating boundaries.

If the sensor data is available as an overlay on a 3D model of the plant, it is a powerful tool to understand how the plant is actually operating and changing over time, he said.

In the oil and gas industry, the objective might be to better understand how a plant's operations are diverging from the design criteria, and how it is changing.

The efforts to gradually improve digital twins could be considered analogous to gradual improvements we have seen in other areas of digital technology, he said. For example we have seen continuous improvements in hotel booking websites, so they now send us e-mails to let us know a room we were previously considering booking has reduced its price.

Building the digital twin

Building a digital twin is not an easy task, particularly when companies have their data and documentation in many different places, he said.

It would be easier if data was delivered in a sensible format from the start, including data from the conceptual phase for the facility, FEED, detailed engineering, construction and handover. All equipment suppliers can be asked to deliver a data model of their equipment. These data models can be put together to make a digital twin of the asset.

Working with it

Working with a digital twin might start with an opening view with some performance indicators, showing how healthy a platform is, and get recommendations of how to improve the platform and equipment.

You can dive into it further to see the 3D model, or get a complete overview of the process, see 2D drawings, get equipment lists, performance indicators. The performance calculations are made directly from different core data sources, including historians, maintenance data.

For example, if you have a problem in a pump, you can bring up the 3D drawing of the pump, and see where it is located in the plant. You can see equipment status, which can be colour coded on a 3D diagram. You can get a sense of the relationships between equipment. You can see real time data overlaid on it.

You can compare the efficiency of the pump in actual operation, compared to how it was designed.

You can get all documentation linked to the equipment. You can bring up an active P&ID showing where the pump is located in the process.

With all of this information, an expert might be able to guess at causes of a problem, for example a blockage in a certain pipe, and then file a request for someone to go and make an inspection. The inspection can be planned to come at the same time as other maintenance activities, so the costs are lower.

Nigel Sams, business development and sales manager oil and gas with Siemens Digital Industries.

You can get recommendations to improve the pump efficiency. Then you can generate work orders and submit them to the maintenance system. In the maintenance system you can see where the current maintenance schedule is.

Siemens software

Siemens produces the COMOS software for engineering and lifecycle management, including a 3D visualisation tool, and its own cloud platform, MINDSPHERE, running on Microsoft Azure. It has operations intelligence software called XHQ.

It works with a number of partners including OSISOFT check, a company which makes data historians used by many oil and gas companies for operational data.

All of this can come together in a "digital asset portal", with some technology from Siemens, some from others. The software can also work on its own.

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NOV – digital twin and monitoring equipment health

National Oilwell Varco (NOV), a manufacturer of equipment and supplier of services for drilling rigs, is developing its digital tool ("Rigsentry") for monitoring equipment health and planning maintenance/ transferring maintenance from scheduled to Condition based philosophy. Julian Zec, chief engineer and manager maintenance and reliability explained how it works

The primary aim is to avoid dangerous equipment failures so called "Cliff events" and also to reduce over-maintenance based on data and information available, enabling customers to drill more effectively with less surprises.

"Companies want to transition from time based maintenance, where maintenance tasks are done in regular intervals according to a schedule, to condition based maintenance, when maintenance is done only when necessary." he said.

NOV has supplied integrated drilling systems for 600 drilling rigs and vessels globally in the last 12 years. It currently provides condition-based maintenance on 55 of these vessels, covering around 17% equipment delivered. In drilling package sales contracts, NOV can

Julian Zec, chief engineer and manager condition based maintenance and reliability with NOV.

have as many as 90 pieces of drilling equipment onboard.

But getting value from this condition monitoring data is proving very difficult, said Julian Zec, chief engineer and manager condition based maintenance and reliability with NOV.

Identifying when maintenance is necessary involves a great deal of connecting NOV residual design knowledge and experience with complex monitoring and data analytics. Market shows that after trying it for a few years, some companies without in depth equipment understanding say that they are not seeing much improvement in performance or reduction in costs, he said.

Value to clients

For a digital project to provide value to clients, it needs to be firmly focussed on the clients' objectives, keeping the asset running reliably and managing costs.

We observe that clients are led by aggressive marketing to expect more value than the current digitalization is capable of delivering, since they had been led to believe that they can just feed data into a computer, press a button and get a perfect maintenance plan, he said.

In reality – you need to master three areas to reach CB goal and unleash value potential. First you need to be able to retrieve data ensuring cybersecurity, right quality and integrity. Second you need to build proper and valuable analytics and information presentation– supporting and not confusing decision taking, and third- you need to have proper organization or partner to execute these decisions in the field.

Companies can have tens of logging devices, including some manual logging, with data fed into multiple applications. These normally produce numerical results, but struggle to put these into the context or extract executional knowledge or actions.

You need a person to review it and make a decision at the end of it. This person may ask some other people for information, who may ask someone else for more information.

Once you have made a decision to do maintenance, you have to mobilise crew and spares, and do the work when the customer decides. All this requires time and resources, and if not streamlined properly may give opposite results then expected. We in NOV have spent years shaping digital products and organization to stand up for the task.

Data analytics

Of the three components to CM/CBM - data gathering, analytics and decision making , the data analytics part is crucial, but is often simplified he said.

"Everybody asks us about data, but few know what to do with data," he said. "We see a huge number of solutions on the market with little understanding of the value chain."

The ultimate purpose of analytics is to extract information and present it to the user, with work which is specific for the work processes, he said.

Getting analytics right involves deep collaboration between the OEM, service company and the client, discussing what data will be available and what to do with it.

Sometimes projects are delayed due to poor collaboration. "It is a half professional way of doing it," he said. "We are losing weeks and months."

Mr Zec illustrated Rigsentry software tool which can indicate the wear of a component. It presents many pieces of data, but the important thing for the client to know is how much longer they can operate the component before maintenance is required. Ideally, the maintenance would be planned to come at the same time as other work.

Decision taking and execution

Condition based maintenance generates data which can be used to get early warning of a problem, so that it can be fixed before the failure becomes critical. But if the 'early warning' is not actually early enough to do the maintenance within a comfortable schedule, it is does not actually provide more value.

It can end up more expensive than traditional methods, if it warns about problems which are not actually problems. This is equivalent to a car warning system which flashes up a message like "check auto gearbox", when nobody, including staff at the garage, know what to do about it. "Such unclear unnecessarily notifications will just make people not use the system," he said.

A further challenge is integrating information architectures across company borders, as advice from NOV's software into the customer's planned maintenance system. Every drilling company has separate software for planning and managing maintenance.

There is also term of "the time scale". Data can be gathered in seconds, but the software team mostly uses agile developments upgrade tools every couple of weeks. Analytics people are working mainly on long term efforts, releasing models with months in between. Whereas field service people are living from moment to moment. It is not easy to combine and synchronize these organizational strategies onto one unified organization, when they have such different dynamics in planning, life cycle and execution, he said. Situation is even more complex if this effort is split between numerous third parties and contractors. We in NOV had to breach standard organizational silos between e.g. engineering and aftermarket.

Human capital

When people's work is reduced to following instructions from a computer, it means they get out of the habit of making decisions themselves, he said. People are essentially reduced to being administrators. Experience teaches us that computer aided design in several areas is probably more precise then human, but it does not appear always to be logical, and in critical operations humans may tend to mistrust computers decisions. And if you don't find the instructions from the system logical, or don't understand the logic, it is very difficult to manage a project correctly, he said. Technology and AI are just not there yet.

A software system can easily provide hundreds of notifications, but leave the task of working out what to do with them (if anything) to a person.

A good way forward could be for industry to work together to focus on most critical and long term goals, of course for different segments , and decide what data, analytics and work processes is necessary to work out how to do that, and then consolidate around it with it, he said.

IntOp – presenting documents in a real world 'context'

Stavanger company IntOp (Intelligent Operations AS) builds 'contexts' which a company's documents can be placed in, enabling documents to be retrieved in a structure which relates to the real world

Stavanger company IntOp (Intelligent Operations AS) builds 'contexts' which a company's documents can be placed in, enabling documents to be retrieved in a structure which relates to the real world.

The purpose is to make it much easier for people to find the right document as they need it, such as the document which will tell them what to do when a pump sensor suddenly fails. A person might expect to be able to enter the pump name, the pump sensor name, and 'failure' into a search engine and bring up instructions which explain what to do.

Corporate information archive systems are usually a long way from being able to deliver this, but if the information is mapped against a 'context', it can become possible.

Another example is encountering a drilling problem. Someone might expect to be able to enter the problem type and bring up documents explaining what to do about it, or what the company did last time it happened.

When people from a younger generation start working at oil and gas companies, "they're not going to be satisfied looking for folders, they want an app see the information here and now," said Stein Fredriksen, CEO of IntOp (Intelligent Operations AS). "Why should we force them to become librarians?"

When doing a complex project such as assessing the viability of an enhanced oil recovery proposal, staff can spend far more time trying to find the relevant information than doing the analysis. It could be considered an "enhanced information recovery" project, Mr Fredriksen joked.

The most important knowledge in a company can sit in unstructured data, reports by people who have been in the company for a long time, he said.

Most companies have shared file storage systems, but the storage structures are not necessarily the most useful, the systems quickly get disorganised, and different departments follow different filing structures, he said.

With the IntOp software, the files themselves do not need to be reorganised, but IntOp can build a 'context' for them to be searched around, related to how people usually work, or how the real life works.

The context could be geographical information, documents which relate to a certain field or part of the world. The context can be generated automatically, or made in consultation with subject matter experts. Typically, people only want to search for data for about 5 different factors, Mr Fredriksen said.

IntOp uses automated tools to "harvest" documents to find out what they appear to be about, and then structure these key themes into 'contexts'.

Because the system does not require any changes to the documents itself, implementing the system is not obtrusive at all. Other approaches to making documents easy to find, such as changing the filing structure or requiring that every document has certain metadata, involve changes to how people work, and also staff time spent chasing people who don't follow the new procedure.

The IntOp system can quickly evolve to follow changes in how documents are being filed and used, so it can keep up with current needs – unlike many initiatives around information structure which are often "few steps behind," Mr Fredriksen said.

The IntOp structure avoids the needs for companies to adopt standard naming conventions across the company, which can be tough when different departments are used to using different terms. With IntOp, everybody can continue as they were, and the 'context design' takes care of it.

For example, if one group refers to a well by a name, and another group refers to it by an ID number, the name and ID number can be connected together.

The IntOp structure also does not require any moving of data into any software or data lake, or creating any software which might became part of the 'legacy' which needs managing in a few years' time. "What we say is, utilise what you have, don't build a new data lake," he said.

Once built, the system can be used immediately via a web browser – login, type in what you are looking for, and the system returns a list of documents relevant to what you are looking for. There is no lengthy period of learning to use a new piece of software.

The IntOp system can work on premise or in cloud, and you can build different apps on top of it.

The contexts can be used by multiple companies. Consider that most oil and gas companies "basically do the same thing, just labelled differently," he said. So you can reuse a context developed for one company, if you change the labelling within it.

Some companies are trying to solve the problem of accessing the right documents by developing sophisticated AI based systems to crawl and index documents and try to 'understand' what they are about, which can be incorporated into search systems which give people the documents they need, he says.

The IntOp approach could be described as a much simpler way to approach the same problem. "You don't have to apply all this fancy AI," he said. "AI is good for some purposes but overkill for some other purposes."

Well context example

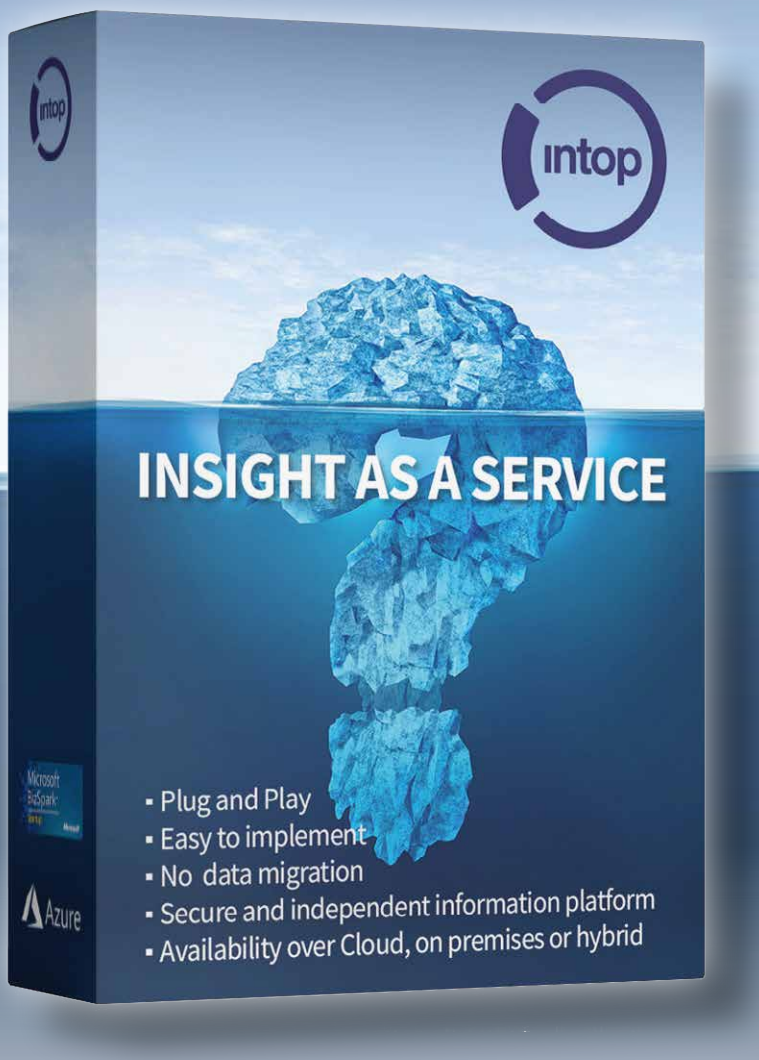
For one company, IntOp was asked to develop a 'problematic well context', a structure for common well problems, which could be used to search for information.

Now the contexts have been built, it is possible to pull out information about any well in the asset, and filter it, for example look for all issues which have occurred at 2,500m depth on any well.

If some documents use metres and some use feet, the context can fix that automatically.

If they want to search for data for a new reservoir or area, the system can say it does not have any reservoirs with that name in the system, but bring up a list of similar reservoirs. You can ask what kind of issues have been encountered in those reservoirs in certain zones.

Some data issues can be fixed with a short instruction, for example if a well description can be written with either a hyphen or an underscore, you could tell the computer to treat an underscore and a hyphen as interchangeable.



INSIGHT AS A SERVICE

HARVEST IntOp Engine has flexible connectors that can connect to data sources and automates the harvest of unstructured data.

PREPARE A unique technology that automatically adds context to data allowing users to navigate and retrieve information from unstructured sources.

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Tor Heldal, Economist, Norwegian Petroleum Directorate

Gladys Hovland, IT Manager, Ocean Installer

Yoseph Ghezai, Senior Associate Geoscientist, Phoenix RDS

Roman Mirzwinski, Geoscientist, Phoenix RDS

Gert De Nul, Business Consultant Oil & Gas, Siemens

Nigel Sams, Business Development & Sales - Oil & Gas, Siemens Digital Industries

Trygve Clausen, Plant Information Management, TIDY AS

Jesse Inoma, M.Sc Student, UiS

Richard Furholt, Consultant, Wintershall

What did you enjoy most about the event?

Subject matter, i.e. the presentations and listening to feedback from attendees.
Nigel Sams (Siemens)

The quality of insights from the presentations and the opportunity to network with other professionals.

Interaction with other participants.
Adrian Park (Hexagon PPM)

Good mix of topics.
(Phoenix RDS)

The presentations.
Mari Helgeland (Hexagon PPM)